

# **Irish Chemical News**

A Journal of the Institute of Chemistry of Ireland

# Live Chemistry Events are Back

# ICI Awards Lectures & Irish Universities Chemistry Colloquium 2022

# **Networking & Social Events**

Young Chemists Committee meet face to face first time in over two years





# Institiúid Ceimice na hÉireann The Institute of Chemistry of Ireland

### ICI Centenary 1922-2022

Patron: Michael D. Higgins, President of Ireland

The Professional Body Representing Chemists in Ireland

Ravensdale Road, Dublin D03 CY66. Web: www.instituteofchemistry.org

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DUBLIN



### **New President Prof Pat Guiry Address**





University College Dublin National University of Ireland

### A Message from the President

Dear Fellows, Members, Graduates and Associates,

I am delighted and honoured to have been elected as President of the Institute of Chemistry of Ireland in the Institute's centenary year. I wish to thank and congratulate my predecessor, Professor Celine Marmion, for the super job she did as President. She was a pleasure to work with and I look forward to working with her in her role as Immediate Past President on Council.

In this issue, you will find details in relation to the ICI Research Awards Day held in the RCSI in early June. Many congratulations to the awardees – Professors Declan Gilheany (UCD) and Paula Colavita (TCD) (Eva Philbin Medallists 2021 and 2022, respectively); Niamh O'Mahoney (UCC) (ICI Postgraduate Awardee). My first role as President of the ICI at the AGM was to award an Honorary Fellowship of the ICI to Professor Nick Farrell of Virginia Commonwealth University, one of the leading researchers in metal-based drugs and bioinorganic chemistry. It was great also to see a Division of Medicinal Chemistry & Chemical Biology recognised by the ICI, an amalgamation of two groups led by Professor Isabel Rozas (TCD) and Dr Marina Rubini (UCD). I wish this Division every success for the future.

The highly successful 73<sup>rd</sup> Irish Chemistry Research Colloquium which took place in June, 2022 will also be featured in this issue. The Colloquia fall under the aegis of the ICI and we are grateful to UCD who hosted and to Professor Declan Gilheany for his role as organiser. It was great to have a face to face meeting of chemists on the island and the new format allowed as many final year PhDs to present their work as requested. I was very pleased to present poster and oral presentation prizes and it is noteworthy that all seven winners of the oral presentation prizes were female, with the quality of the talks and posters being truly first class. I like the new format and hope it will be replicated in the future, with NUIG as the proposed host for the 2023 event. We also had a superb plenary lecture from Professor Matt Kitching of Durham University entitled '*Enantioselective Crystallographic Synthesis of Ammonium Cations and a Potentially Limitless Chiral Pool via Conglomerate Crystallisation*'.

As President of the EuChemS Division of Organic Chemistry, I initiated a series of 'Highlighting Organic Chemistry' virtual symposia across Europe. The first event focused on Italy in March and the second on Ireland in June, with seven speakers from across the island. Many thanks to Professor Anita Maguire (UCC), Professor Peter Crowley (NUIG), Dr Peter Knipe (QUB), Dr Joanna McGouran (TCD), Professor

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Stefan Oscarson and Dr Eoghan McGarrigle (UCD) and Professor Donal O'Shea (RCSI) who delivered excellent talks across a breadth of chemistry. If you missed the event, then you can catch up by watching it on YouTube (<u>https://www.youtube.com/watch?v=8bRE4gMY-kA)</u>.

Many thanks to the ICI Young Chemists' Network (YCN) who continue to work hard to provide support to the younger members of our community. We are enormously grateful to Colm McKeever, Maynooth University, who has taken up the role as ICI YCN chair. I know that Colm and his team were highly visible at the recent Colloquium in UCD and have a number of events planned to further support our young chemists so please keep an eye out on the ICI website but also on their social media channels for updates (details on ICI website). Please support them by promoting these events amongst the young chemists in your institutions.

We are well underway with planning the 9<sup>th</sup> EuChemS Congress which will be held in Dublin in July 2024. Ireland will be well represented at the 8<sup>th</sup> EuChemS Congress in Lisbon in late August with a series of Invited Lectures and Oral Communications. Council members and Noel Mitchell of Keynote will be present to learn from that event and to promote our Congress in 2024. Dr Susan Kelleher (DCU) and Robert Elmes (Maynooth University) will deliver lectures at the EuChemS Division of Organic Chemistry Young Investigator Workshop in Lisbon (September 2-4<sup>th</sup>) and this is an excellent opportunity to present their research and network with other young academics from across Europe, the USA and Canada.

The above are just selected updates and highlights from this latest ICN issue but as you can see from the Table of Contents, this issue contains a wide range of topics. I do hope you enjoy reading it.

I wish to thank our Editor, Patrick Hobbs, who brings our community up to speed on national and international topics that are of most interest to our community. This is a significant undertaking and is much appreciated. My thanks also to all Council members who voluntarily give of their time and expertise to support our Institute and community. A special thanks to you, our ICI Fellows, members, graduates and associates. Please do keep in touch and send us your updates. We would be delighted to showcase these on our ICI website and in future ICN issues.

With best regards,

Professor Pat Guiry PhD FRSC FICI MRIA President, Institute of Chemistry of Ireland 29<sup>th</sup> June, 2022





### A Message from the Immediate Past President

Dear Fellows, Members, Graduates and Associates,

I do hope you and your families are keeping safe and well.

As you know, my three year term as ICI President ended in June. It has been an incredible honour and privilege to serve as President during this time. May I first and foremost congratulate Professor Patrick Guiry and Professor Steven Bell on taking up the roles of President and Vice-President, respectively. Wishing Professor Guiry and Professor Bell every success in their respective roles.

May I also take this opportunity to thank the entire ICI community for your incredible support and for your active engagement with the Institute during my term as President. A special word of thanks to Council members, who give of their expertise and time freely to support the Institute. A lot of work, as you can imagine, goes on behind the scenes. An annual highlight of the Institute is the presentation of numerous, prestigious awards; the ICI Second Level Education Award, the ICI Postgraduate Award, the ICI Annual Award for Chemistry (Eva Philbin Public Lecture Series), the ICI David Brown Award and the ICI Boyle Higgins' Gold Medal and Lecture Award. Despite a global pandemic, we managed to retain our annual award ceremonies, albeit virtually. In fact, being forced to host the event online, as a result of the COVID-19 related restrictions imposed by government, ironically meant that more of our community could attend. Notwithstanding this, it was simply wonderful to be able to host our most recent award ceremony live, in RCSI, in June, bringing us together, in person, for the first time in three years. I hope I speak for others when I say that I genuinely felt a sense of camaraderie and community during this special event. Perhaps, going forward, we may be able to explore the feasibility of hosting an in person ceremony that can also be live-streamed so that as many of our community as possible have the opportunity to attend. It was wonderful also to see the launch of a new Division of the Institute during our most recent award ceremony; the ICI Division of Medicinal and Biological Chemistry. A special congratulations to all involved.

A significant ICI advancement in recent times has been the establishment of the ICI Young Chemists' Network (ICI YCN); a network led by young chemists for young chemists. This Network, which promotes the personal and professional development of our young chemists in Ireland, has simply grown from strength to strength since its establishment. Our young chemists are our future so it is incredibly important that we continue to support them in whatever way we can.

A significant challenge for the Institute over the last three years, as a direct result of the pandemic, was the need to reschedule the EuChemS Congress that the Institute had planned to host in 2022, to coincide with the ICI centenary celebrations. There were logistical as well as financial

implications arising from this, all of which, thankfully, have now been resolved. We are pleased that the Institute will be hosting the EuChemS Congress in Dublin from 7<sup>th</sup>-11<sup>th</sup> July, 2024. This is an incredible opportunity for us to showcase and celebrate the depth and breadth of excellent chemistry research taking place across our HEIs in Ireland.

It is such an exciting time to be part of the Institute. I do hope you will continue to stay engaged and that you will encourage your colleagues and peers to join the Institute if not already members. In the meantime, may I take this opportunity to thank you all once again for your enormous support over the last three years and to wish you all continued success, good health and happiness.

Coline Mornion

Professor Celine J. Marmion PhD FRSC FICI Past President, Institute of Chemistry of Ireland 28<sup>th</sup> June, 2022



### **Editorial**

Its summer and live events are back after three years. In this Issue 2 of ICN three live events are covered. Two Institute events here held in RCSI and UCD respectively. Another industry event "The 2022 National Manufacturing & Supply Chain Conference & Exhibition" was held in Simmons Court, Dublin. It was very clear at these events that people are delighted to meet face to face again and are tired of on-line webinars. Our Young Chemists' Network Committee members met in person for the first time at the Irish Universities Chemistry Research Colloquium with great joy at the personal contact. Two other virtual meetings were held in spring and summer. On March 8<sup>th</sup> 2022, International Women's Day, the Young Chemist's Network assembled an online panel consisting of inspiring women from a broad range of chemical disciplines. The second webinar was "Highlighting Organic Chemistry in Ireland" on Friday, 10th June 2022 with seven speakers from Ireland organised and hosted by Professor Guiry.

The Institute is progressing and expanding with two new groups joining to make a new division Called Medicinal Chemistry & Biological Chemistry. The new groups joining the new division are Medicinal Chemistry Ireland and Dublin based Chemical Biology. There are two short articles about these two groups.

Our ICI Awards, Networking & Social Reception was hosted by RCSI on June 8<sup>th</sup> and is cover in this Issue with photos. Similarly "The Irish Universities Chemistry Colloquium" was held in UCD and reported here. The Manufacturing & Supply Chain Conference & Exhibition at Simmonscourt, Dublin this year covering a wide range of topics such as sustainability, climate change, research & innovation and lean manufacturing.

Our AGM was held on June 8<sup>th</sup> after the Awards Ceremony and Professor Pat Guiry, UCD was duly elected President. We on the Council are delighted to have such a high profile chemist take on the role of President and be our President during the 9<sup>th</sup> European Chemistry Society Congress in 2024. Professor Celine Marmion, RCSI is stepping down after three very busy and demanding years with some challenges which she very successfully navigated the Institute through and a big thanks to her for that. Celine will continue on Council as Immediate Past President.

Some new topics have been introduced reflecting a lot of papers and reports being published and which will soon have a big impact in research, drug discovery, medicine, biological & structural chemistry and many aspects of our lives. The first is Artificial Intelligence and soon to have a big impact on super computers is Quantum Computing. These new sections are pretty long with introductory material but will be shorted in future.

The chemistry section has become very large and in this Issue, this science has been split into two and the new section is "Medicinal Chemistry, Chemical Biology & Life Sciences" reflecting the interests of our new division. In the chemistry not many links to the American Chemical Society publications are included as generally they are not open access and are subscription or institutional access. You can expand a blank box and read but it is not user friendly and occupies a small section of your screen. Nevertheless you can gain access by buying or using an academic library for interesting articles. The Climate Change has been modified to better reflect content which is broad ranging and is now relabelled "Climate Change, Environment, Sustainability & Related Topics" A very short section called "Low Energy Nuclear Reactions" is added reflecting some of the nuclear chemistry happening in conventional and planned

power reactors. Fusion Power continues to generate debate with arguments about supplies of tritium, the artificial isotope of hydrogen in very low natural abundance. The ITER project in France continues to generate controversy around costs, delays, energy generated versus energy input to run the reactor as well as the effect of neutron bombardment on materials of construction. This project has a massive carbon footprint with the amount of concrete and steel used in construction.

EuChemS is very active with the ECC 8 Chemistry Congress happening in late August. An important topic with EuChemS is a series on elements and the last element webinar was on the element nitrogen. There are two links to this one day event morning and afternoon webinars. The Institute and our profession conference organiser Keynote are working with EuChemS on topics and content for ECC 9, 2024 in Dublin.

Battery Technology, Solar Cells and Green Hydrogen continue to generate large volumes of reports and huge investment and innovation.

The usual sections covering Science Foundation Ireland, The IDA and Enterprise Ireland are covered. SFI and the Irish Research Council (IRC) are expecting to or planned to be merged into a new entity according to some reports but full details have yet to emerge.

The SARS CoV-2 Covid-2 section is much shorter as previously indicated. This pandemic has not gone away and care is still needed. The Omicron variant and sub-variants in particular BA.4 and BA.5 have caused a summer spike in most countries as predicted but fortunately deaths and serious illness are showing only a modest increase. The good news is that most people who need boosters can get them and great progress is being made in developing better vaccines for these new variants. The number of publications on the virus and Covid disease has increased in recent weeks as medics try to understand the long term effects so Issue 3 will continue to cover this virus but will be short.

The Siliconrepublic section is shortened as once you visit the site more than a limited amount of time access is denied and it becomes subscription only, apart from a sentence or two. This section will probably be dropper going forward.

# The 8<sup>th</sup> EuChemS Chemistry Congress (ECC8) will take place in person - August 28 to September 1, 2022. Plan to attend and support EuChemS and the Portuguese Chemical Society.

Comments and Responses are welcome and can be sent to the Editor Email address: -

### editor@instituteofchemistry.org

Patrick Hobbs MSc, FICI, CChem, CSci, MRSC. Editor Irish Chemical News 1<sup>st</sup> July 2022

Note: Opinions expressed in this Journal are those of the authors and not necessarily those of the Institute.



### The Institute of Chemistry of Ireland Awards

The ICI Boyle Higgins Gold Medal and Lecture Award The ICI Annual Award for Chemistry (Eva Philbin Public Lecture Series) The ICI Postgraduate Award

#### The Boyle Higgins Gold Medal and Lecture Award

The Boyle Higgins Gold Medal and Lecture Award, instituted in 1985, is an award for research work carried out in chemistry under the headings: (a) Pure Chemistry, (b) Applied and Industrial Chemistry or (c) Chemical Education. The award recognizes a chemist of any nationality working in Ireland or a chemist who is an Irish citizen working overseas who has made an outstanding and internationally recognised research contribution to the advancement of chemistry. A person nominated for this award must be a member of the Institute at the time of nomination or upon receipt of the award.

Nomination process: The nominator shall indicate in writing to the President of the Institute the category which applies to their nominee and they shall submit by email one electronic copy which will include a brief statement outlining the reasons for the nomination, together with a CV (maximum 3 pages) of the nominee. Nominations will be externally reviewed by two independent referees, who are recognised experts in the category and who are not nominators.

#### The ICI Annual Award for Chemistry (Eva Philbin Public Lecture Series)

This award is for a practising chemist, who has made a significant contribution to the advancement of chemistry and has considerably raised the profile of chemistry through both the excellence of their work and their ability to communicate in an effective and lucid manner. **The recipient, who may be an Irish or international chemist of repute,** will present lectures in three locations in Ireland (including Dublin), which will be open to the public. A person nominated for this award must be a member of the Institute at the time of nomination or upon receipt of the award.

Nomination process: The nominator shall send one electronic copy of their nomination by email to the President of the Institute, which will include a cover letter providing a brief statement outlining the reasons for the nomination, together with a CV (maximum 3 pages) of the nominee. Nominations for this award will be externally reviewed.

#### **The ICI Postgraduate Award**

The nominee must be a registered PhD student in any Chemistry discipline working in an Irish Higher Education Institution. They must have demonstrated excellence in research through publications. They must also have demonstrated a commitment to supporting and promoting Chemistry within their Institution (e.g. through active participation in public engagement initiatives). A person nominated for this award must be a member of the Institute at the time of nomination or upon receipt of the award.

Nomination Process: The nominator, who must be the student's PhD supervisor, shall send one electronic copy of their nomination by email to the President of the Institute, which will include a cover letter providing a brief resume of the reasons for the nomination, together with a CV (maximum 2 pages) of the nominee.

For these awards and others see ICI website <u>https://www.chemistryireland.org/awards-events</u> Nominations to be sent to the ICI President at: <u>president@instituteofchemistry.org</u>

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- 11th March, 2022
- Notification of Oral Communications Acceptance: 29th April, 202
- Deadline for Poster Communications Presenters: 29th june, 2022
- Notification of Poster Communications Acceptance: 3st June, 2022
- Deadline for Student Grant Application: 29th April, 2022 REGISTRATION
- · Standard Registration deadline: 17th June, 2022
- Late registration deadline:
- 5th August, 2022

No No No No No No.

- twitter.com/EuChem5\_Congres
- facebook.com/EuChemS2022

# EuChemS

McGill University, Canada Joanna Aizenberg (Materials) Harvard University, USA

João Rocha (Materials and Solids) University of Aveiro, Portugal Lutz Ackermann (Catalysis) University of Göttingen, Germany

National Research Council, Italy

The University of Tokyo, Japan

Nicola Armaroli (Energy and Sustainability)

Takuzo Aida (Polymer and Supramolecular Chemistry)

SP/esterae Mathematika in Bethaladika



# Institiúid Ceimice na hÉireann The Institute of Chemistry of Ireland

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https://www.chemistryireland.org/

	Institute of Chamistry of Ireland			
Institute of Chemistry of Ireland				
AIIII	Annual Award Ceremony and 73 <sup>14</sup> Annual General Meeting			
	Wednesday, 8 <sup>th</sup> June, 2022			
	at 16.00 in the Albert Lecture Theatre			
	RCSI University of Medicine and Health Sciences			
	Please register <u>here</u>			
	Registration deadline: Monday, 6 <sup>th</sup> June, 2022			
16.00-16.20	Welcome and ICI Update			
16 20 16 20	Professor Celine Marmion, ICI President			
16.20-16.30	Professor Isabel Rozas, Trinity College Dublin			
16:30-16:45	ICI Postgraduate Award 2022 - Award Lecture			
	'The Periodic Table of my PhD'			
	Niamh O'Mahoney, University College Cork			
16:45-16:55	ICI Young Chemists' Network (ICI YCN) – Update			
	Colm McKeever, Chair, ICl YCN			
16.55-17.25	ICI Annual Award for Chemistry (Eva Philbin Public Lecture Series) 2020			
	'Asymmetric Catalysis and Organophosphorus Chemistry: Synthesis, Mechanisms and the People			
	Invoived Professor Declan Gilheanv. University College Dublin			
	···,····,···,···,···,···,···,···			
17.25-17.55	ICI Annual Award for Chemistry (Eva Philbin Public Lecture Series) 2021			
	Harnessing the properties of functional carbons for sustainable energy technologies Professor Paula E. Colavita. Trinity College Dublin			
	· · · · · · · · · · · · · · · · · · ·			
17.55-18.00	Closing Remarks			
	Professor Celine Marmion, ICI President			
18.00-18.45	BREAK - Wine Reception (Atrium)			
18.45-19.15	73 <sup>rd</sup> Annual General Meeting (AGM) – Albert LT			
	All ICI members are welcome to attend but registration by completing the link above is			
	essential			

### ICI Annual Awards Ceremony, June 2022 Photos at Lectures, Networking & Social Reception



Prof Celine Marmion Introduces proceedings



Prof Isabel Rozas ICI Division of Medicinal & Biological Chemistry



Dr Marina Rubini Chemical Biology Ireland



Niamh O'Mahoney UCC, ICI Post Grad Awardee 2022 presented with her plaque by the Institute's President Prof Celine Marmion RCSI





Niamh with her parents



Colm McKreever Chair, ICI Young Chemists Network (ICO\_YCN)



'Asymmetric Catalysis and Organophosphorus Chemistry: Synthesis, Mechanisms and the People Involved'

Introduced by Prof Pat Guiry UCD, Prof Declan Gilheany UCD, ICI Annual Award for Chemistry (Eva Philbin Public Lecture Series) 2020 delivers his lecture and receiving is plaque from ICI President Prof Celine Marmion



'Harnessing the properties of functional carbons for sustainable energy technologies'

Introduced by Prof Mike Lyons Head of Chemistry Department TCD, Prof Paula E. Colavita TCD, ICI Annual Award for Chemistry (Eva Philbin Public Lecture Series) 2021 delivers lecture and receiving her plaque from ICI President Prof Celine Marmion



Prof Celine Marmion presents Prof Nicolas Farrell, Virginia Commonwealth University | VCU · Department of Chemistry with the David Brown Award - a crystal bowl



Photo in the Atrium of ICI Prize winners 2020 -2022 with ICI President Prof Celine Marmion RSCI, including Prof Nicolas Farrell, and winner of ICI David Brown Award 2021, & Honorary Fellow of ICI. Prof Paula E. Colavita, Prof Declan Gilheany.



Incoming President Prof Pat Guiry presented Outgoing President Prof Celine Marmion with bouquet of flowers



Celine congratulates Pat on becoming our new President after passing over the Institute's Presidential Medal



Prof Guiry presents Prof Nicolas Farrell Virginia Commonwealth University with his FICI Certificate

After the Awards, Social Mixing in the Atrium with first person to person after the Covid 19 crisis giving members a change to catch up after over two years of on line events.



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## The Institute Expands; Two New Groups Form New Division: Medicinal Chemistry & Chemical Biology Division



# Medicinal Chemistry Ireland

In 2016 a number of researchers in Ireland with expertise in medicinal chemistry got together to organise the first Medicinal Chemistry Ireland meeting. This first event took place in Trinity College Dublin with a great attendance (120 attendees, five sponsors and seven international speakers from academia and industry plus four prizes for best posters supported by Catalent). Our aim was not only to promote the field of medicinal chemistry by encouraging cooperation between the medicinal chemists in Ireland, but also to be an international showcase. Considering the large number of pharmaceutical companies with operative sites in Ireland (north and south), the number of researchers working in the field in Irish Universities as well as the successful degrees in Medicinal Chemistry being developed by several of our universities, we thought that there was an appetite and a need for this type of meetings.

After this initial conference, a strong network of medicinal chemists in Ireland was established and, thus, we were able to organise a second edition of the Medicinal Chemistry Ireland conference in 2018. This meeting took place in Dublin City University with a very good attendance (at national and international levels), industrial sponsorship as well as four prizes for best poster presentations (supported by Almac). This successful meeting was supposed to be followed by another in Galway in 2020 and even though the preparations for this conference were almost completed, COVID-19 crossed our path leaving both the meeting and our lives in limbo for a while. Considering that the third edition of the conference had to be cancelled in 2020, in 2021 we decided to run an electronic conference to keep the interest going. This event with 6 Irish based researchers' talks was also a success and was followed by more than 200 people in some moments. This year we will hold the third edition of the conference in NUI-Galway on June 17<sup>th</sup> with a wonderful panel of international speakers. We have also introduced a novelty, what we call the "Irish hour", where we have invited three young researchers based on Irish institutions to give short communications. We are really looking forward to this conference!

Since this network of medicinal chemists in Ireland was getting stronger and considering that our 'sister' network in Chemical Biology was organising their first international meeting, we jointly decided to apply for a Division within the Institute of Chemistry of Ireland which was launched at the ICI Annual Award Ceremony on June 8<sup>th</sup>. This represents a fundamental step in our disciplines and will allow us a stronger support of medicinal and biological chemistry in Ireland (north and south). Additionally, and as the Division of Medicinal and Biological Chemistry of the ICI, we are applying to join the European Federation of Medicinal Chemistry and Chemical Biology (EFMC) which is the most important organization at European level in the field. When adherence to EFMC requirements is successfully achieved, this will allow us to become full members of EFMC by January 2023.

It is wonderful to see how, in the recent years, researchers in medicinal chemistry and chemical biology working in Irish institutions have been able to get together into a group under the umbrella of the Institute of Chemistry of Ireland. This group will support all members of the medicinal chemistry and chemical biology community in Ireland not only at academic level but also from industry and will further promote these amazing areas of research.

Article by Prof Isabel Rozas TCD, Medicinal Chemistry Ireland



# New Chemical Biology Group based in Dublin formed

This new network group from two Dublin based universities initially set up in 2020 to provide an international platform for knowledge exchange and networking for Irish scientists working in the emerging field of Chemical Biology. The initial group of three researchers is led by Prof Marina Rubini, UCD and supported by Prof Joanna McGouran and Prof Eoin Scanlan both from TCD.

Main Organisor



Marina Rubini +353-1-7162967 Email marina.rubini@ucd.ie

Event website ChemBioIreland2022 (google.com)

### Local organizing committee



Eoin Scanlan Trinity College Dublin scanlanen@tcd.ie



Joanna McGouran Trinity College Dublin jmcgouran@tcd.ie

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Marina Rubini graduated at the University of Padova (Italy), before starting her PhD at Max Planck Institute for Biochemistry under the supervision of Prof. Ned Budisa, where she worked on protein engineering and design with non-natural amino acids. After obtaining her PhD degree in 2004 from the Technical University of Munich, she undertook postdoctoral work in the group of Prof. Arne Skerra (TU Munich) and in the group of Prof. Andreas Marx (University of Konstanz) where she established the expertise of incorporation of non-natural amino acids into proteins in the laboratory of the PIs. In 2012 she became a junior group leader at the University of Konstanz, with focus on modulation of protein folding and stability and creation of homogeneous decorated proteins by "click" chemistry. Since October 2016 she is Assistant Professor (permanent academic staff member) for Chemical Biology at University College Dublin. She is currently working on semisynthetic approaches for engineering therapeutic proteins to study the effect of posttranslational modifications, such as glycosylations, at a molecular level, on the synthesis and introduction of non-natural amino acids into proteins, in order to gain new insight into protein folding pathways and mechanisms, and on the chemoselective late-stage modification of antifungal peptides.

Joanna McGouran obtained a 1st class MChem Degree from the University of Oxford. Following this she completed her PhD at the University of Oxford with Professor Ben Davis. Joanna then worked as a postdoctoral researcher with Professor Benedikt Kessler in the Department of Medicine, where she created novel ubiquitin-based covalent capture probes and developed inhibitor screening assays. She returned to chemistry department at the University of Oxford in 2014 to work with Professor Tom Brown where her research focused on the study of DNA cross-link repair enzymes, developing assays to study their selectivity and for inhibitor screening. In 2016, Joanna moved to Trinity College Dublin to take up the position of Schuler Assistant Professor in Translational Organic Chemistry. Research in the laboratory focuses on the synthesis of new activity-based probes for chemical biology and molecular physiology applications. Current research focuses on DNA damage repair and deubiquitinating enzymes (DUBs) as two key regulatory classes of enzyme, on the synthesis of inhibitors and activity-based probes for poorly characterised nucleases, and on the generation of modified peptides to inhibit protein-protein interactions.

Eoin Scanlan graduated from the National University of Ireland, Galway in 2000. He completed his PhD in organic chemistry at the University of St. Andrews, UK, under the supervision of Prof. John Walton (2004). Following postdoctoral work with Prof. Philippe Renaud at the University of Bern, Switzerland and Prof. Benjamin Davis at the University of Oxford, UK, he started his independent academic career in Trinity College Dublin in 2008. He is currently Associate Professor of Organic and Medicinal Chemistry, Director of Medicinal Chemistry and a PI in the Trinity Biomedical Sciences Institute. His research interests include synthetic organic chemistry, synthetic methodology, glycoscience and the synthesis and biological study of novel therapeutics.

In 2020, three scientists from University College Dublin (Prof Marina Rubini) and from Trinity College Dublin (Prof Joanna McGouran and Prof Eoin Scanlan) decided to organise the first Chemical Biology Ireland conference with the aim to provide an international platform for knowledge exchange and networking for Irish scientists working in the emerging field of Chemical Biology and related disciplines at the interface between bioorganic chemistry, biochemistry, and medicinal chemistry. The conference had to be postponed due to the Covid pandemic and it will take place on the 8th-9th of August 2022 in University College Dublin. We have 13 invited speakers, 4 of them from Ireland and Northern Ireland, and 9 international speakers from the USA, Canada, UK, Switzerland, and Germany.

The Chemical biology research area began to emerge at the beginning of the new millennium when chemists started to apply chemical tools to shed light on biological processes and systems at a molecular level. In this IRISH CHEMICAL NEWS ISSUE NO.2 MAY/ JUNE 2022

rapidly growing field, novel multidisciplinary approaches are being developed to elucidate fundamental questions in molecular and cellular biology to ultimately aid drug discovery processes, vaccines, and contribute to the clarification of disease mechanisms. Our goal is to enhance the innovative potential of the Irish-based research groups. Secondly, we aim at creating networking opportunities among researchers based in Ireland. These networking events are meant to foster the establishment of new collaborations, to better exploit the existing research potential and to evaluate dormant synergies. Thirdly, we want to increase the visibility of Irish Chemical Biology Research internationally, in order to foster new ideas and collaborations, and thereby create the foundation for collaborative projects to apply for exchequer funding from the European Union and international funding sources.

ChemBioIreland2022 (google.com)

https://sites.google.com/view/chembioireland2020/home#h.p\_2twS4GpJJRwA



### ICI Chemistry Colloquium at UCD 2022 O'Brien Centre for Science 15/16 June



### Final Schedule

Wed 15th June, 9.15 AM: Welcome: Professor Pat Guiry, President, Institute of Chemistry of Ireland

	9.30 - 10.50	Theatre D (Agilent Sponsored) Organic Synthesis (Chair: P. Byrne) Cian Reid Sheila Fitzgerald Ashis Dhara Alex Gibney	Theatre E (Mason Technology Sponsore Materials 1 (Chair: D.G. Gilheany) Aisling Fleming Yaoguang Song Nilotpal Kapuria			
		Tea/Coffee, Mounting of J	Posters			
	11.30 - 12.50	Reaction Mechanism (Chair E McGarrigle) Joshua O'Donnell Gavin Lennon Lorna Doyle Sadbh Byrne	Materials 2 (Chair: K.M. Ryan) Vivek Christhunathan Anthony Dodd Mohini Mishra Yiming Huang			
	Lunch (Local Outlets)					
	2.00 - 3.00	Biological Activity (Chair P.V. Murphy) Eoin Hever Mark Stitch Caytlin Boylan	Chemical Imaging (Chair: J. Lowry) David Cullinane Colm McKeever Niamh Curtin			
Tea/Coffee, Viewing of Posters, Presentation by Almac about Careers						
	4.00 - 5.00	Dr Matthew O. Kitching, Durham University	v. Theatre D			
	Almac	Almac Enantioselective Crystallographic Synthesis of Ammonium Cations				
	Plenary Lecture	and a Potentially Limitless Chiral Pool via Co	onglomerate Crystallisation			
	5.30 - 8.30	Poster Session with associated Hot Food an	oster Session with associated Hot Food and Drinks reception			
		Sponsored by the Royal Society of Chemistry, Local Section				
		5.30 – 6.30 Even-Numbered Posters; 6.30 – 7.30 Odd-Numbered Posters				
	Thursday 16th Jun	e Theatre D (Fluorochem Sponsored)	Theatre E (GPE Scientific Sponsored)			
	9.30 - 10.50	Flow Chemistry (Chair: M. Baumann)	Medicinal Chemistry (Chair: F. Kelleher)			

9.30 - 10.50	Flow Chemistry (Chair: M. Baumann)	Medicinal Chemistry (Chair: F. Kelleher)		
	Cormac Bracken	Cathal Caulfield		
	Ailbhe Ryan	Karolina Wojtczak		
	Lara Nolan	Hua Tong		
	Aoife Kearney	Liam Fitzgerald		

Tea/Coffee

 11.30 - 1.10
 CO2 Chemistry (Chair J. Sullivan)
 Therapeutic Agents (Chair: S. Bell)

 Florian Cerpentier
 Ioannis Titilas

 Kristy Stanley
 Neville Murphy

 Daniel Kerr
 Ashutosh Sharma

 Qi Huang
 Avelino Ferreira

 Amy Bridget Lowry
 Erika Mooney

1.15-1.30 Closing: Professor James Sullivan & Prize Giving: Professor Pat Guiry (Prizes ICI Sponsored)

### LIST OF POSTER PRESENTERS, TITLES and PRINCIPAL INVESTIGATORS

N	lo	Name	Univ	Principal Investigator	Poster Title
	1	Aaron McCormack	NUIG	Paul V. Murphy	New Prospects of Carbohydrates as Chiral Auxiliaries for Tandem Cycloaddition Reactions: Batch vs Flow
	2	Aidan Cregan	UCC	Peter Byrne	H-Phosphonate-Promoted Halogenation of Alcohols using Lithium Halides
	3	Aine Coogan	TCD	Yurii Gun'ko	Chiroptically Active Copper Oxide Microstructures via Post-Synthetic Treatment of Copper-Aluminium Layered Double Hydroxides
,	4	Aisling Fleming	UCD	Kenneth Dawson	Development of an Immunogold Mapping Strategy to Unravel the Biomolecular Architecture of Bionanocomposite Materials
	5	Aleksandra Krajewska	TCD	Aidan McDonald	Synthesis of Negatively Charged 2D 2H-MoS <sub>2</sub> and Its Functionalization
	6	Alice Parkes	UL	Emmet O'Reilly & Gavin Walker	Controlling the Polymorphism of Carbamazepine by Droplet-Confinement via Spray Drving
	7	Amit Upadhyay	UCC	Timothy O'Sullivan	Development of a Synthetic Route to Novel IMPDH Inhibitors
;	8	Andreea Cislaru	MU	Roisin O'Flaherty	Characterisation of Serum IgG Glycosylation in Cystinosis
9	9	Ashis Dhara	NUIG	Paul V. Murphy	Design and Synthesis of Carbohydrate Based Galectin Inhibitors
1	0	Cathal Kelly	QUB	Stuart James	Scrambled Macrocycles for Greener Porous Liquids
1	1	Ciara Davis	TUS	Peter Downey	Effects of selenium Application on Growth and Selenium Uptake in Lettuce.
1	2	Ciara Tyner	UCC	Stuart Collins & Anita Maguire	Studies in Intramolecular Buchner Reactions
1	3	Clara Evans	MU	Denise Rooney & Frances Heaney	Stability and Biological Activity of Novel Silver-based Antifungals to Avoid Antimicrobial Resistance
14	Co	onor Geraghty	MU	Robert Elmes	The Design and Synthesis of Ruthenium (II) Polypyridyl Complexes as Luminescent Probes for Nitroreductase
15	Co	onor Shine	RCSI	Marc Devocelle	The Development of PEG-based Antimicrobial Peptidomimetics
16	Da	ara Curran	UCC	Peter Byrne	Phosphorus-based Reductive Etherification of Aldehydes
17	Da	arren Beirne	MU	Diego Montagner & Trinidad V-Torrijos	Development of Dual-action Pt(IV)-Tyrosine Kinase Inhibitor Pro-drug Conjugates Targeting Colorectal Cancer
18	Da	avid Ryan	UCC	Peter Byrne	A New Rationale to Describe Ambident Reactivity
19	Eir	mear Courtney	UCC	David Jones &. Gerard McGlacken	Application of a Supported Manganese Catalyst in C-H Activation and Reductive
20	Eo	oghain Murphy	MU	Eithne Dempsey	Electroanalysis of Dexamethasone using Template Free Deposition of Copper Particles on Glassy Carbon Electrodes with Quantitation in Pharmaceutical
21	Eo	oin Hever	NUIG	Paul V. Murphy	Design, Synthesis and Biological Evaluation of Galactosidase Inhibitors
22	Eo	oin Moynihan	MU	Diego Montagner &	Click-Pt(IV)-carbohydrate Pro-drugs for Treatment of Osteosarcoma
23	Ev	a Naughton	UCD	James Sullivan	Development of $Cu_2O/Ag_3PO_4$ Heterojunction Photocatalysts for Conversion of
24	Fa	arhad Mohammed	MU	Robert Elmes	Towards the Design and Synthesis of a New Biomimetic Code: Squaratides
25	Fo	oteini Dimakopoulou	NUIG	Constantina	Novel $Co_5$ and $Ni_4$ Metal Clusters by the Combination of 2-Pyridyl Oximes with
26	Ha	annah McKeever	UL	Shalini Singh	Polycarboxylic Ligands Colloidal Synthesis of Copper Bismuth Selenide Nanocrystals as Ionic
27	Hi	lal Kirpik	MU	Robert Elmes	A New 3-Substituted BODIPY dye: Synthesis, Crystal Structure, and Photophysical
28	Ηι	ugh Mohan	DCU	Silvia Giordani	Supramolecular Functionalisation of B/N Co-doped Carbon Nano-onions for
29	Ja	ick Bennett	NUIG	Paul V. Murphy	Applying Continuous Flow Techniques in the Synthesis of Sugar-based Therapeutics

30	Jacqueline Smyth	RCSI	Donal O'Shea	Exfoliation and Surface Functionalisation of Graphene in Water
31	Justynne Joy Fabian	TUD	Brendan Duffy	Surface Modification of Titanium Alloys for Biomedical Applications
32	Kate Donaghy	UCD	Eoghan McGarrigle	Stereoselective Synthesis of $\alpha$ -Galactosides
33	Kathryn McCarthy	NUIG	Pau Farràs	Two-Dimensional Porphyrin-Based Covalent Organic Frameworks as
34	Keane Mc Namee	MU	John Lowry	The Development and Characterisation of a Biosensor for the Real-time Neurochemical Monitoring of Lactate
35	Keelan Byrne	MU	Tobias Krämer	Quantum Chemical Study of Low-Valent Aluminium Compounds
36	Kishan Mandal	NUIG	Paul V. Murphy	Design and Synthesis of Sialyl Triazoles as Siglec-8 Ligands
37	Kyle Doherty	MU	Trinidad Velasco-Torrijos	Development of Norbornene-based Compounds with Proposed Synergistic Anti- biofilm and Anti-adhesion Activities
38	Laura Foley	UL	Emmett O Reilly	Developing a Roadmap to Effective Spray Drying of Biomolecules
39	Lauren Kearney	DCU	Mary T. Price	A Photocatalytic & Electrocatalytic Investigation into Rhenium Tricarbonyl N- Heterocyclic Carbene Complexes for CO <sub>2</sub> Reduction
40	Levente Nagy	NUIG	Pau Farràs	Biphenyl Bridging Ligands as Building Blocks for Photoluminescent One- dimensional Gold Coordination Polymers
41	Lewis More O Farrell	TUD RCSI	Christine O'Connor & Darren Griffith	Next-Generation Gallium Complexes to Combat Antimicrobial Resistance
42	Liam Fitzgerald	NUIG	Paul V. Murphy	Outcome of Docking of some Simple Sialic acid Derivatives to Influenza Hemagglutinin and Synthesis of Glycocluster
43	Lorna Doyle	TCD	Aidan McDonald	Activation of a Mn <sup>II</sup> Mn <sup>III</sup> -Peroxide with relevance to the Catalytic Cycle of Ib RNRs
44	Luke Brennan	MU	Robert Elmes	A Supramolecular Approach to Anti-Microbial Resistance: Anionophores that Induce Disruption of Bacterial Chloride Homeostasis
45	Mairéad Gallagher	TUD	Fintan Kelleher	Antibiotic Metabolites: Synthesis and Characterisation of the Human Metabolites of Ciprofloxacin

# Book of Abstracts:

Cover for Book of Abstracts (ucd.ie)

Colloquium 2022 Talk Winners, Presented by Prof Pat Guiry, Institute President



Karolina Wojtczak



Yiming Huang QUB IRISH CHEMICAL NEWS ISSUE NO.2 MAY/ JUNE 2022



Niamh Curtin RSCI



Aoife Kearney UCC IRISH CHEMICAL NEWS ISSUE NO.2 MAY/ JUNE 2022



Sheila Fitzgerald RCSI



Sadbh Byrne UCD Note: Caytlin Boyland not present for Presentations

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Colloquium 2022 Poster Winners, Presented by Prof Pat Guiry, Institute President



Niraj Nitish Patil UL





Lauren Kearney DCU



Farhad Mohammed MU

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Lorna Doyle TCD



Aidan Cregan UCC

Note: Clara Evans not present for Presentations

# **Colloquium Posters, Networking, Socialising and Reception**









???? &Aidan Cregan UCC



Some are hungry



General view of poster line



K McNamee MU & ?

Kishan Mandal UNIG &









Dr Susan Quinn UCD & ?



Mona Alanezi NUIG

David Ryan UCC

SOUTH -





Jessica ONeill, Lauren Kearney, Florian Cerpentier, Ross McGarry, Martyna Bartusiak



Dr Nessan Kerrigan of DCU, Dr. Peter Byrne of UCC, & Dr. Matthew Kitching of Durham University (plenary speaker), Aidan Cregan UCC



Aleksandra Krajewska





View of posters at the end of the evening



UCD Group: Dr Karen Fox, Rebecca Lynch, Vanessa Becker, and Kate Donaghy Dr Eoghan McGarrigle



Young Chemists Group: Cathal Kelly (QUB rep) Colm McKeever (Chairperson and MU rep) Liam Fitzgerald (NUIG rep) Siobháin O'Flaherty (RCSI rep) Jessica O'Neill (Vice chair and DCU rep) Ciara Davis (TUS rep)

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#### "Highlighting Organic Chemistry in Ireland"

Friday, 10<sup>th</sup> June 2022

#### **PROGRAMME (Times are GMT)**

1 pm -1.15 pm	Introduction – Professor Pat Guiry (President of the Institute of Chemistry of Ireland; Representative of Ireland, EuChemS Division of Organic Chemistry)
1.15 pm - 1.45 pm	<b>Professor Anita Maguire (University College Cork)</b> "Recent Adventures in Synthetic Organic Chemistry"
1.45 pm – 2.15 pm	Professor Peter Crowley (National University of Ireland, Galway) "Macrocycle-mediated Protein Frameworks"
2.15 pm - 2.45 pm	<b>Dr Eoghan McGarrigle (University College Dublin)</b> "Coupling N-Heterocycles and Organocatalytic Nucleophilic Additions to N-Heterocycles"
2.45 pm – 3.15 pm	<b>Dr Peter Knipe (Queen's University Belfast)</b> "Multi-dimensional Exploration of Conformational Space in Foldamers"
3.15 pm – 3.30 pm	Coffee – Tea Break
3.30 pm – 4 pm	<b>Professor Stefan Oscarson (University College Dublin)</b> "A Chemical Biology Approach Towards the Development of Fungal Vaccines and Study of Fungal Cell Walls"
4 pm – 4.30 pm	<b>Dr Joanna McGouran (Trinity College Dublin)</b> "Modified Nucleosides, Nucleotides and Oligonucleotides to Probe DNA Damage Repair"
4.30 – 5 pm	Professor Donal O'Shea (Royal College of Surgeons in Ireland, University of Medicine and Health Sciences) "Forecasting Vaping Health Risks through Al Prediction of Flavor Pyrolysis Reactions"
5 pm	Closing Remarks: Professor Pat Guiry, President, EuChemS Division of Organic Chemistry



## Postponed from 2020

## **Important Dates**

Dear 8<sup>th</sup> EuChemS congress attendant these are the important dates to mark in your calendar.

CALL for ABSTRACT

Oral Communications Presenters: 11<sup>th</sup> March, 2022 Notification of Oral Communications Acceptance: 29<sup>th</sup> April, 2022

Poster Communications Presenters: 29<sup>th</sup> April, 2022 Notification of Poster Communications Acceptance: 3rd June, 2022

Student Grant Application: 7th June, 2022

#### PROGRAM

**Preliminary Program:** 10<sup>th</sup> June, 2022 **Final Programme:** 27<sup>th</sup> June, 2022

#### REGISTRATION

**Standard Registration deadline:** 17<sup>th</sup> June, 2022 **Late registration deadline:** 5<sup>th</sup> August, 2022



The Portuguese Chemical Society (SPQ), with the support of the Portuguese Electrochemical Society (SPE), has the great pleasure of organizing the 8<sup>th</sup>EuChemS Chemistry Congress (ECC8), to be held in Lisbon, Portugal, from August 28 to September 1, 2022.

The 8 EuCheMS Chemistry Congress is being built under the unifying theme of Chemistry the Central Science, focusing on the central role of chemistry at the interfaces with biology, material and environmental sciences, both for the progress of humankind and for the solution of fundamental problems of modern societies. An exciting scientific program led by world class experts will develop around seven main scientific topics:

- Advances in Synthetic Organic Methodologies
- Metal Containing Compounds and Solids: Properties and Applications
- Chemistry meets Biology
- Colloids and Materials
- Biomaterials and Medicinal Chemistry
- Catalysis
- Spectroscopic and Analytical Tools / Advanced Physical Chemistry

accompanied by three sessions devoted to topics of particular relevance to join scientists from different areas:

- Chemistry and Society
- Functional Materials
- Food Chemistry

and the final one organized by EYCN, the EuChemS European Young Chemists' Network of EuChemS The program will be completed by three general and particularly important themes, which will run every day and provide a general view of the field, going beyond the view from each classical area:

- Molecules in Motion
- Energy, Environment and Sustainability
- Imaging

This conference will be the 8<sup>th</sup> in a series that started in Hungary, and was held in several cities before reaching Lisbon. All of them reached very high scientific levels, giving to all the participants the opportunity of listening to the most celebrated world speakers presenting state of the art advances in chemical sciences and to discuss openly with the chemistry community.



## Themes

<b>Theme A:</b> Advances in Synthetic Organic Methodologies <b>Conveners:</b> Luis Vicario, Sophie Beeren	Si
<b>Theme B:</b> Metal Containing Compounds and Solids: Properties and Applications <b>Conveners:</b> Katharina Fromm, Silvia Gross	Au
Theme C: Chemistry Meets Biology Conveners: Mario Salmona, Sonja Herres-Pawlis	Ν
Theme D: Colloids and Materials Conveners: Maria Lucia Curri, Pablo Ordejon	Pd
Theme E: Biomaterials and Medicinal Chemistry Conveners: Avi Schroeder, Holger Stephan	0
Theme F: Catalysis Conveners: Bert F. Sels, Paolo Melchiorre	S
<b>Theme G:</b> Spectroscopy and Perspectives in Analytica Chemistry / Advances in Physical Chemistry <b>Conveners:</b> Christian Huck, John Cassidy	Fe

## Transversal Themes

Theme 1: Imaging<br/>Conveners: Johan Hofkens, Roland WinterEuTheme 2: Energy, Environment and Sustainability<br/>Convener: Maria F. Montemor, Piotr StepnowskiHTheme 3: Molecules in Motion<br/>Conveners: Nicolas Giuseppone, Oren SchermanP

# Additional Sections Section I: Functional Materials Conveners: Bo Albinsson, Nazario Martin Section II: Chemistry and Society Conveners: Joseph Moran, Rachel Mamlok-Naaman Section III: Masterclasses – Lunch break Conveners: Artur Silva, Luisa De Cola

European Young Chemists' Network (EYCN)





#### **Scientific Committee**

Luisa De Cola, France – Chair – Materials Mário N. Berberan Santos Portugal – Co-Chair – Spectroscopy/Physical Chemistry Artur M. S. Silva, Portugal – Portuguese Chemical Society - Organic Chemistry – Synthesis Alice Solda, Italy - European Young Chemists' Network Katharina M. Fromm, Switzerland – Inorganic chemistry and solids Piotr Stepnowski, Poland - Analytical & Environmental Chemistry Maria Lucia Curri, Italy – Nanostructured and multifunctional materials Paolo Melchiorre, Spain – Catalysis and Photocatalysis Oren Scherman, United Kingdom – Dynamic supramolecular assemblies John Cassidy, Ireland - Analytical Chemistry and Instrumentation Johan Hofkens, Belgium - Spectroscopy and Imaging

#### **Organizing Committee**

Adelino Galvão, SPQ General Secretariat, IST, Universidade de Lisboa Ana Isabel Ricardo, FCT, Universidade Nova de Lisboa Antonio M. Rodríguez García Spain - European Young Chemists´ Network Fernanda Proença, Universidade do Minho Joaquim Faria, SPQ Vice-President, FEUP, Universidade do Porto Luísa Martins, SPE, IST, Universidade de Lisboa Manuel Minas da Piedade, FCUL, Universidade de Lisboa Maria José Calhorda, FCUL, Universidade de Lisboa Rui Fausto, FCT, Universidade de Coimbra Tito Trindade, Universidade de Aveiro Vítor Freitas, FCUP, Universidade do Porto



## D Preliminary Program

	28.08	29.08	30.08	31.08	01.09	
	Sunday	Monday	Tuesday	Wednesday	Thursday	
8:30-9:10		Plenary Lectures				
09:15			ABCDEEGY			
10:30		Coffee Break				
11:00						
12:30						
Lunch Session		Chemistry in Space	Chemistry in Hollywood	Chemistry and Arts	Pitches from challenges	
14:00	Registration				GDCh – Prize	
15:30-16.00		Coffee Break			(2020 and 2021)	
		-	Energy,	Molecules in	EYCA Awards	
17:45	Opening Ceremony	Imaging	and Sustainability	Motion	Closing Ceremony	
17:45-18:30	PL – EuChemS Gold medal 2022	Plenary Lectures				
18:30 - 19.15	PL – EuChemS Gold medal 2020	ERCs 5x8min talks	ERCs 5x8min talks	ERCs 5x8min talks		
21:00	Welcome Party	POSTER SESSIONS		Social Dinner		



## **Conference Web Site:**

## http://www.euchems2022.eu

Check the ECC8 web site for updates and:

- Registration
- Fees
- Bursaries & Support
- Location
- Accommodation
- EYCN Company Challenge
- Abstracts Submission
- Sponsorship
- Exhibitors



## Scientific Program



Hanadi Sleiman

Chemistry and Biology McGill University, Canada



Lutz Ackermann Catalysis University of Gottingen, Germany Swww



Takuzo Aida

Polymer and Supramolecular Chemistry The University of Tokyo, Japan



August Wilhelm von Hofmann Denkmünze 2022 Yale University, USA



**Cristina Nevado** 

Organic Synthesis/Medicinal Chemistry University of Zurich, Switzerland



Nicola Armaroli

Energy and Sustainability National Research Council, Bologna, Italy



**Dame Carol Robinson** 

EuChemS Gold Medal 2022 University of Oxford, UK



August Wilhelm von Hofmann Denkmünze 2022 Warner Babcock Institute for Green Chemistry, USA

@ WAAAAA



Materials and Solids University of Aveiro, Portugal



Clément Sanchez Materials Collège de France, France



**Michele Parrinello** 

EuChemS Gold Medal 2020 Eidgenössische Technische Hochschule Zürich, Switzerland Ø www



EuChemS Lecture Award 2020 Eidgenössische Technische Hochschule Zürich, Switzerland Ø www



#### 9th EuChemS European Chemistry Congress 2024 deferred from 2022 in Dublin

#### The Institute & Keynote with EuChemS are currently Planning Content and Topics for ECC 9 in 2024

At the meeting of its Executive Council, The European Chemical Society (EuChemS) executive awarded the 9<sup>th</sup> EuChemS European Chemistry Congress to Dublin. This prestigious congress is held every two years and brings together the leading researchers and industry partners in all chemistry disciplines from across Europe and the wider international arena.



**Ireland Section** 

The organisers expect over 1,500 delegates from around the globe to attend the event in The Convention Centre Dublin, in 2024. The five-day programme will consist of plenary and parallel lectures, poster sessions, symposia, networking events, and an industrial exhibition.

**The European Chemical Society**, was official announced at ECC7 in Liverpool, August 2018. Formerly (2004–2018) the European Association for Chemical and Molecular Sciences (EuCheMS) and before that (1970–2004) the Federation of European Chemical Societies (FECS).

The European Chemical Society (EuChemS) coordinates the work of almost all the European Chemical Societies. As an organization, it provides an independent and authoritative voice on all matters relating to chemistry, and places chemistry at the heart of policy in Europe. Furthermore, EuChemS seeks to develop its members through various activities, workshops and awards.

Under the new EuChemS the next Congress, ECC8 will be hosted by **The Portuguese Chemical Society** (SPQ), with the support of the **Portuguese Electrochemical Society** (SPE), invites you to attend this must go to series of European chemistry conferences, the **8th EuChemS Chemistry Congress (8ECC)**, to be held in Lisbon, Portugal, from 28th August to 1st September, 2022.



#### **Chemistry** in Europe

Chemistry in Europe is a EuChemS quarterly publication mainly intended for an audience of chemists, but everyone is welcome to subscribe! Its objective is to inform about research in Europe, to provide updates from EuChemS Member Organisations, and to look into policy-related developments.

#### **EDITORIAL**

#### ECC8 in Lisbon: Chemistry, the Central Science

The European Chemical Society and the Sociedade Portuguesa de Química organises the 8th EuChemS Chemistry Congress (ECC8) in Lisbon from 28 August until 1 September 2022. The conference, first scheduled in 2020, and postponed to 2022 because of the pandemic situation, wishes to continue a tradition of excellence in chemistry in Europe, started in Budapest in 2006.

With the theme "Chemistry the Central Science", the congress aims to emphasize the central role of chemistry at the interfaces with biology, material and environmental sciences, both for the progress of humanity and for the solution of important problems that our society is facing. The discussions on different aspects of the chemical sciences will take place over five days filled with plenary lectures, oral and poster communications, and many activities that should stimulate interactions, imagination, and promote knowledge in the broadest context possible. Besides the parallel sessions, on different themes spanning from organic chemistry to catalysis, from metal containing systems to spectroscopy and solid state, from colloids to materials and medicinal chemistry, this edition has introduced three transversal topics: Molecules in Motion, Energy, Environment and Sustainability and Imaging that will be tackled from different aspects.

In addition, young scientist sessions with oral talks will show the new emerging directions and exciting lunch tutorials at the interface with art, cinema and astronomy will further contribute to the spread of science and fun.

The conference will open with the European Chemistry Gold Medal award ceremony, to recognize the achievement of two scientists working in the field of chemistry in Europe. Dame Carol Robinson and Michele Parrinello were selected as recipients of the 2022 and the 2020 awards, respectively.

At the closing session, several awards will be presented, such as the one from the Gesellschaft Deutscher Chemiker (GDCh; German Chemical Society).

The presence of more than 25 countries and an excellent gender balance reflects that science has no barriers, and it speaks a single language that everyone can understand and use to communicate, like music.

And I believe that we all hope that science can bring peace and we look forward to the EuChemS conference in a Europe and in a world with no war.

#### Louisa De Cola Chair of the ECC8 Scientific Committee

#### FOCUS

#### Lisbon to host EuChemS annual meetings

In addition to the ECC8, the 2022 **EuChemS General Assembly** meeting, and the **Annual Professional Networks** meeting will be held in Lisbon as well, on the days preceding the congress. We invite you to read the details about the EuChemS annual meetings and access the registration forms <u>here</u>.

#### 2022 EuChemS General Assembly

Before the 8th EuChemS Chemistry Congress in Lisbon, EuChemS will be organising the 2022 EuChemS General Assembly and Professional Networks Annual meetings.

The 2022 EuChemS General Assembly will take place in Lisbon on:

- Friday 26 August afternoon
- Saturday 27 August in the morning

#### Please note:

General Assembly sessions on Friday 26 August afternoon are for EuChemS representatives with voting rights and EuChemS Executive Board members only.

General Assembly sessions on Saturday 27 August are for representatives of EuChemS Member Societies and Supporting Members, EuChemS Executive Board Members, Chairs and Treasurers of EuChemS Divisions, Working Parties, EYCN and invited guests.

The 2022 Annual meeting of the Professional Networks will take place on Saturday 27 August in the afternoon. This meeting is for the representatives of the Professional Networks only.

#### **Registration (compulsory)**

We kindly invite the Presidents and representatives of EuChemS Member Organisations, as well as EuChemS Executive Board members to register for the General Assembly here: <u>https://www.euchems.eu/general-assembly-2022-registration/</u>

We kindly invite representatives of EuChemS Professional Networks to register for the General Assembly meeting and the annual meeting of the Professional Networks here: <u>https://www.euchems.eu/general-assembly-professional-networks-meetings-2022-registration/</u>

The registration deadline for representatives of EuChemS Member Organisations and supporting Members with voting rights is **30 June at 18:00 Lisbon local time**. Please note that the registration deadline for those with voting rights must be respected due to legal obligations.

The registration deadline for those without voting rights is 22 July at 18:00 Lisbon local time.

More details on Venue, Accommodation how to use the Voting Platform available on this page:

2022 General Assembly - EuChemS

Read Chemistry in Europe: Chemistry in Europe • 2022-1 - EuChemS Newsletters



EuChemS organised its third workshop of the 'periodic table' series, this time focusing on the nitrogen element. In the workshop, titled "The Nitrogen Element – Sustainable food production?", experts from a wide range of areas discussed the role and future of nitrogen use in agriculture.

The European Chemical Society, EuChemS, organised the science policy workshop 'The Nitrogen Element – Sustainable food production?' on 26 April 2022, from 10:00 to 16:30 CEST. This webinar was chaired by Alessandra Quadrelli.

This online event was an initiative designed by the EuChemS Periodic Table <u>Task Group</u>. The Task Group is chaired by Nicola Armaroli and its members are David Cole-Hamilton, Christophe Copéret, Rinaldo Poli, Floris Rutjes, Maximillian Menche (EYCN Chair), and Alessandra Quadrelli as a guest. **Objectives of the workshop** 

The purpose of the webinar was to answer key questions such as: How does ammonia production fit within the planetary nitrogen cycle at the basis of nutrition? To what extent can the impact of ammonia production be reduced without compromising food production? Are there alternatives to the Haber-Bosch process and at what costs? Can we promote the sustainable use of this essential element?

#### **Programme and speakers**

#### **Morning session**

#### from 10:00 to 12:30

- **10:00 10:05** | Opening *Floris Rutjes (EuChemS President)* & introductory remarks by Alessandra Quadrelli (CNRS)
- 10:05 10:20 | The EuChemS Periodic Table Nicola Armaroli (CNR)
- 10:20 10:40 |The nitrogen cycle of terrestrial ecosystems & planetary boundaries Nina Buchmann (ETH Zurich)
- 10:40 11:00 | The Haber-Bosch Process and sustainable paths to the future Thoa Thi Minh Nguyen (Haldor Topsøe)

#### 10 MINUTES BREAK

- 11:10 11:30 | How could Europe halve nitrogen waste by 2030? From Haber Bosch to the Circular Economy
  Mark Sutton (UK Centre for Ecolomy & Hydrolomy (UKCEH))
  - Mark Sutton, (UK Centre for Ecology & Hydrology (UKCEH))
- 11:30 12:30 | Panel Discussion led by Alessandra Quadrelli

### Afternoon session

- from 13:30 to 16:30
  - 13:30 13:50 | Do we need the Haber-Bosch? Improved nitrogen use efficiency related to livestock farming
    *Rune Ingels (N2Applied)*
  - **13:50 14:10** | Can Precision Agriculture help to meet fertilization reduction *Wouter Maes (Ghent University)*
  - 14:10 14:30 | "Impossible" anammox bacteria for sustainable removal of nitrogen from wastewater

Mike Jetten (Radboud University)

#### 10 MINUTES BREAK

- **14:40 15:00** | Heading for real-zero: from hydrocarbons to hydronitrogen *Bill David (University of Oxford)*
- 15:00 15:10 | Significance of the 'Resolution on Sustainable Nitrogen Management' adopted at the 5th UN Environment Assembly (Feb. 2022)
  Mark Sutton (UK Centre for Ecology & Hydrology (UKCEH))
- **15:10 15:30** | Earth System Science, sustainability and the nitrogen cycle *Sarah Cornell (Stockholm Resilience Centre)*
- 15:30 16:25 | Panel Discussion led by Floris Rutjes (EuChemS President)
- 16:25 16:30 | Conclusions Alessandra Quadrelli (CNRS)

#### **Speakers**

#### Alessandra Quadrelli, CNRS and CPE Lyon



Alessandra Quadrelli is director of research of the French National Centre for Scientific Research, CNRS, at the IRCELYON laboratories and chairs the CPE Lyon Engineering School Sustainable Development Chair. She serves as associate editor of the RSC journal "Green Chemistry". Her research focuses on organometallic mechanisms on surfaces (like silica, MOFs and 2D wafers) for heterogeneous catalytic reduction of  $N_2$  and  $CO_2$  en route to renewable energy storage.

More info: Alessandra considers her Top-3 professional achievements: A new mechanism for  $N_2$  cleavage (SCIENCE, 2007), the creation of the "CO<sub>2</sub> forum" conferences (<u>http://co2forum.cpe.fr</u>) and the synthesis of a MoS<sub>2</sub> monolayer by Atomic Layer Deposition, ALD (NANOSCALE, 2017). Her overall research has led to 85 publications in international peer reviewed papers (h = 27, S<sub>cit</sub> 4200 as of 2021), 4 patents, 11 book chapters, 2 co-edited books and 53 invitations to international congresses there included 1 plenary at ICEC 2020 and 5 keynotes (EUROPACAT, ICOMC, EuCHEMS-GC, ISHHC, ACHEMA).

#### Floris Rutjes, EuChemS President



Floris Rutjes (1966) received his PhD at the University of Amsterdam in 1993 under the supervision of the late Prof. Speckamp. After a post-doctoral stay with Prof. Nicolaou at The Scripps Research Institute (La Jolla, USA) and an assistant-professorship at the University of Amsterdam, he became full professor in organic synthesis at Radboud University (Nijmegen, NL) in 1999. His research interests comprise the synthesis of biologically active heterocyclic molecules, new bioorthogonal click-probes for chemical ligation, and continuous flow synthesis in microreactors. He has received several awards including the Gold Medal of the Royal Netherlands Chemical Society (2002), the AstraZeneca Award for Research in Organic Chemistry (2003), and in 2008 was announced 'Most entrepreneurial scientist of the Netherlands'. Currently, he is Director of the Institute for Molecules and Materials at Radboud University and president of the European Chemical Society (EuChemS)

#### Nicola Armaroli, member of the EuChemS Executive Board (Chair)



Nicola Armaroli got the Ph.D. in Chemical Sciences in 1994 at the University of Bologna. Since 2007 he has been Research Director at CNR, the Italian National Research Council. He is member of the Italian National Academy of Sciences and Fellow of the Royal Society of Chemistry (FRSC). Within EuChemS, he is an elected member of the Executive Board and a former chairman of the Working Party on Chemistry and Energy He serves as associate editor of Photochemical & Photobiological Sciences (Springer Nature), member of the Editorial Board of Chemistry-A European Journal (Wiley-VCH) and Polyhedron (Elsevier Science) as well as director of Sapere, the first Italian science periodical, established in 1935.

His scientific activity is concerned with photochemistry and photophysics, in particular luminescent materials and systems for the conversion of light into electricity and fuels. He also studies the transition of the global energy system towards more sustainable models, also in relation to climate change and scarcity of natural resources.

He has received several awards as a recognition of his work.

#### Nina Buchmann, ETH Zurich



Nina Buchmann is a tenured Professor of Grassland Sciences at ETH Zurich, Switzerland. She holds a PhD degree from the University of Bayreuth, Germany, worked as a postdoc at the University of Utah, Salt Lake City, USA, and headed her own research group at the Max Planck Institute for Biogeochemistry, Jena, Germany. The main research topics of Nina Buchmann include (1) plant and ecosystem physiology, (2) biogeochemistry of terrestrial ecosystems, in particular biosphere-atmosphere gas exchange, and (3) interactions among biodiversity, ecosystem functions/services, and sustainable resource use. She is the National Focal Point for ICOS Switzerland and with her groups runs the Swiss Fluxnet, a network of six long-term ecosystem greenhouse gas flux measurement sites, covering all major land-use types in Switzerland (grassland, cropland, forest). Nina Buchmann published more than 340 articles and co-wrote a textbook on "Plant Ecology". She is a member of the National Academy of Sciences in Germany, Fellow of the American Geophysical Union in 2018, and a "Highly Cited Researcher" in 2018 and 2019. Just recently, she received the Distinguished Alumni Award 2022 of the University of Utah, School of Biological Sciences.

#### Sarah Cornell, Stockholm Resilience Institute



Sarah Cornell is a global environmental change scientist. In her role as associate professor and principal researcher at the Stockholm Resilience Centre at Stockholm University, she leads a research group that seeks to integrate global perspectives into social-ecological systems approaches for dealing with risks, resource use and societal responses to environmental challenges. Much of her work involves interaction with the worlds of policy and business.

Sarah began her academic career as an atmospheric chemist studying the human perturbation of nitrogen's global biogeochemical cycle. She has over 20 years of interdisciplinary research experience working on human dimensions of global change, first at UEA's Centre for Social and Economic Research on the Global Environment, then the Tyndall Centre. Before moving to Sweden, she was the science coordinator for QUEST, the UK Natural Environment Research Council's directed programme for Earth system science. She has been involved in international strategic networks for global change research that connects social and biophysical sciences, including Future Earth and UNESCO's BRIDGES sustainability science coalition. She is an associate editor for the journal *Environmental Science and Policy*.

#### **Bill David, University of Oxford**



Bill David is Professor of Energy Materials Chemistry in the Inorganic Chemistry Laboratory at the University of Oxford and STFC Senior Fellow at the Rutherford Appleton Laboratory. He is a Fellow of the Institute of Physics and the Royal Society of Chemistry. He is also a Fellow of the Royal Society and is a member of the Society's Net-Zero programme. Bill's research interests are based around sustainable and scalable zero-carbon chemical and electrochemical energy storage and power provision, focussing on high-power sodium-ion batteries and exploring the options for developing ammonia as a green fuel.

#### **Rune Ingels, N2Applied**



Dr Rune Ingels finished his M.Sc. in Chemical Engineering at Institute of Technology of University of Trondheim, Norway. He worked at Yara Int. from 1982 until 2010 as Process Engineer, on the production of Green Ammonia and licensing fertilizer technologies to China, also as R&D Director and VP Technology Strategy. He seconded to Qafco 1987-1993, seconded to Sluiskil 1999-2002 and seconded to Lifeco 2009-2015. He was the CEO Tinfos ASA from 2015 to 2017. The company is operating, financing, and constructing Small scale Hydro Electric Power Plants.

He's the CTO of N2 Applied since 2010. He Co-founded this plasma-based nitrogen fertilizer technology company. The technology is processing livestock slurry making Nitrate Enriched Organic fertilizer, NEO and stopping ammonia and methane emissions.

#### Mike Jetten, Radboud University



Prof Jetten (1962) is a world leader in the field of environmental microbiology. He did his PhD (1991) at WUR on aceticlastic methanogens, followed by a post doc at MIT on metabolic engineering of amino acid producers. From 1994-2000 he was assistant professor at TU Delft on Nitrogen cycle microbiology. Since 2000 he is professor of Microbiology at Radboud University, Nijmegen. He received the prestigious ERC Advanced Grant in 2008 for his research on anammox bacteria, the Spinozapremie in 2012, and a second

ERC Advanced grant in 2013 to study the ecology of methane oxidizers. Since 2013 he scientific director of the Gravitation consortium on anaerobic microbiology (Soehngen Institute of anaerobic microbiology). He is a member of the Royal Netherlands Academy of Sciences, the European Academy of Science and EMBO. In 2013 he was bestowed with a knighthood for his exceptional services to science and society. In 2017, he was recognized as exceptional mentor and awarded with best PhD supervisor of the year by the National PhD council in the Netherlands. In 2019 he was awarded an ERC Synergy grant together with Utrecht University. He has published more than 500 papers that have been cited more than 70000 times. FWIW H index is 129. He has supervised 60 PhD theses and 36 post docs, and 22 PhD students and 8 post docs are currently working in his laboratory. In September 2015, his team started the first Microbiology master education in the Netherlands. He has been invited more than 250 times for keynote lectures and organized many international meetings and conferences. He holds several patents.

#### Wouter Maes, Ghent University



Wouter Maes is professor in monitoring with UAVs at the Department of Plants and Crops, Ghent University, Belgium. He is also Research leader of the satellite lab on remote sensing of plant health at the FABI institute of the University of Pretoria, South Africa. His research focuses in particular on the application of UAV sensing technology for Precision Agriculture purposes, encompassing thermal, hyperspectral as well high resolution RGB sensing.

#### Thoa Thi Minh Nguyen, Haldor Topsøe



Thoa Nguyen is currently R&D Senior Director at Haldor Topsoe, a Danish company supplying catalysts, technology, hardware and engineering for the Chemicals, Clean Fuels and Clean Air industries. She has worked as metallurgist in gold processing in Australia and been with Haldor Topsoe R&D since 2008, working in a number of different processes, such as ammonia, reforming, water-gas-shift, fuel production, etc., both within catalyst and technology development, having roles from research engineer to project manager and people manager. In her current role, she has the overall responsibility for technology development within gasoline, diesel, marine and jet fuel, taking them from ideas to the lab, pilot and subsequently to commercialisation. She completed her Ph.D. at Cambridge University, UK using magnetic resonance imaging (MRI) on trickle-bed reactors after graduating from Adelaide University, Australia in Chemical Engineering.

#### Mark Sutton, UK Centre for Ecology & Hydrology



Professor Mark Sutton is an environmental physicist based at the UK Centre for Ecology & Hydrology (UKCEH), in Edinburgh. An expert on atmospheric ammonia, he leads international research activities on nitrogen at the science–policy interface. He is a former chair of the International Nitrogen Initiative (INI) and currently directs the UNEP/GEF International Nitrogen Management System (INMS) and the UKRI Global Challenges Research Fund's South Asian Nitrogen Hub (SANH). Professor Sutton is also a co-chair of the UNECE Task Force on Reactive Nitrogen (TFRN) and vice chair of the Global Partnership on Nutrient Management (GPNM).

You can watch the recording of the event on our <u>YouTube channel!</u> Published on June 7<sup>th</sup>.



**The Nitrogen Element – Sustainable food production? [MORNING SESSION]** 7 June 2022 The Nitrogen Element – Sustainable food production? [MORNING SESSION] - YouTube

**The Nitrogen Element – Sustainable food production? [AFTERNOON SESSION]** 7 June 2022 The Nitrogen Element – Sustainable food production? [AFTERNOON SESSION] - YouTube

## EuChemS Events Calendar

#### Jun 2022

Date/Time	Event
<b>06/06/2022 - 10/06/2022</b>	<b>10th International Conference on Mechanochemistry and Mechanical Alloying</b>
All Day	Faculty of Engineering and Architecture, Cagliari
<b>10/06/2022</b> All Day	Mechanochemistry Meets Industry II - Economic considerations and business perspectives University of Cagliari, Cagliari CA
<b>12/06/2022 - 16/06/2022</b>	XLVI "Attilio Corbella" International Summer School on Organic Synthesis
All Day	Palazzo Feltrinelli Via Castello 3, Gargnano BS
<b>13/06/2022 - 16/06/2022</b>	<b>4th Training School 'Mechanochemical Synthesis and Kinetics'</b>
All Day	University of Cagliari, Cagliari CA
<b>23/06/2022 - 24/06/2022</b> All Day	Green and Unconventional Synthesis, Approaches and Functional Assessment AIM 2020 (AIM 2020 Advanced Inorganic Materials) Department of Chemistry University of Bari, Campus, Bari
<b>27/06/2022 - 30/06/2022</b>	XXXVIII Reunión Bienal de la Real Sociedad Española de Química
All Day	Palacio de Conngresos de Granada, Granada
<b>28/06/2022 - 01/07/2022</b>	25th International Symposium for High-Performance Thin-Layer Chromatography
All Day	Faculty of Chemistry and Chemical Technology, University of Ljubljana, Ljubljana
<b>28/06/2022 - 01/07/2022</b>	<b>26th International Symposium on Separation Sciences - ISSS 2022</b>
All Day	Faculty of Chemistry and Chemical Technology, University of Ljubljana, Ljubljana
<b>30/06/2022 - 01/07/2022</b>	Curiosity - A French-German Young Chemists Conference
All Day	Faculté de sciences Techniques de l'Université de Haute-Alsace Campus Illberg, bâtiment K, amphithéâtre Taglang,
<b>Jul 2022</b>	MULHOUSE

Date/Time	Event
<b>11/07/2022 - 13/07/2022</b>	European Conference of Research in Chemistry Education (ECRICE 2020)
All Day	Weizmann Institute of Science, Rehovot
<b>13/07/2022 - 14/07/2022</b>	<b>Total Food 2022: maximising value from the food chain</b>
All Day	Jubilee Conference Centre, Nottingham
<b>18/07/2022 - 22/07/2022</b>	Second International Conference on Noncovalent Interactions 2021-2022 - ICNI2021
All Day	University of Strasbourg, Esplanade Campus, Strasbourg, France, Strasbourg

## Aug 2022

Date/Time	Event
28/08/2022 - 01/09/2022	8th EuChemS Chemistry Congress (ECC8)
All Day	Lisbon Congress Center, Lisbon

#### Sep 2022

Date/Time	Event
<b>04/09/2022 - 06/09/2022</b>	<b>13th Spanish-Italian Symposium on Organic Chemistry</b>
All Day	El Seminari Centre Tarraconense, Tarragona
<b>05/09/2022 - 09/09/2022</b>	9th IUPAC International Conference on Green Chemistry - ICGC-9
All Day	Zappeion Megaron, Athens
<b>21/09/2022 - 23/09/2022</b>	<b>19. Ružička days</b>
All Day	Javna ustanova u kulturi Hrvatski dom Vukovar, Vukovar

#### Oct 2022

Date/Time	Event
<b>05/10/2022 - 07/10/2022</b>	<b>7 MS Food Day</b>
All Day	Camera di Commercio di Firenze, Florence
<b>12/10/2022 - 14/10/2022</b>	Chemical Research in Flanders - Chemistry Conference for Young Scientists 2022
All Day	Floréal, Blankenberge
23/10/2022 - 26/10/2022 All Day	31st International Symposium on the Chemistry of Natural Products and 11th International Congress on Biodiversity (ISCNP31 & ICOB11) Hotel Royal Continental and Centro Congressi Partenope, Naples

Date/Time

Event

Solutions in Chemistry 2022 08/11/2022 - 11/11/2022 All Day

Terme Sveti Martin, Call us Toplice Sveti Martin, Sveti Martin na Muri



## EuChemS Yearbook 2021 is out

Feb 14, 2022

Every year, the European Chemical Society (EuChemS) publishes a Yearbook to highlight major advancements of its chemistry community.

This annual report reflects on the impactful initiatives of EuChemS in policy areas, it looks back on the various meetings and events that were held throughout the year, as well as science communication accomplishments. It offers an insightful overview of EuChemS Professional Networks and their work. The Yearbook 2021 also proudly presents the winners of several EuChemS awards. This publication is a result of a collaborative work of a very many, coordinated by the Secretariat team, with the editorial written by Floris Rutjes, EuChemS President.

The EuChemS Yearbook 2021 is now available online!



#### **SFI-IRC Pathway Programme**



#### Background

Science Foundation Ireland (SFI) and the Irish Research Council (IRC) are pleased to launch the SFI-IRC Pathway Programme which will support talented postdoctoral researchers from all research disciplines to develop their track record and transition to become independent research leaders.

These awards will enable postdoctoral researchers to conduct independent research for a four-year period and will provide funding for a postgraduate student who will be primarily supervised by the applicant.

The programme welcomes research proposals from any discipline within STEM or AHSS. Applications of an interdisciplinary nature which draw together insights and approaches from one or more research disciplines will also be welcomed.

#### **Programme objectives**

To enable talented postdoctoral researchers to develop their track record and establish themselves as independent investigators, with the support of their research body.

To provide a mechanism for Irish higher education institutions to retain excellent early career researchers from all disciplines and support their development towards becoming research leaders of the future. To fund excellent research with potential impact across all disciplines.

To contribute to further development of the higher education system through knowledge creation, training and skill development.

To support early career researchers in securing non-Exchequer funding and develop their network through the European Research Area.

To increase the representation of female researchers in the higher education sector and promote alignment with international policies including research assessment, open science and equality, diversity and inclusion.

To contribute to a cohesive research ecosystem in Ireland and support SFI and the IRC in achieving their strategic objectives, as described in the strategic plan for each agency. Information webinar

An information webinar for potential applicants and associated research office staff will be hosted on Thursday 2 June 2022 at 12pm. Potential applicants should register to attend here. Last year's webinar can be viewed below:

> SFI IRC Pathway Programme Webinar 29 April 2020 SFI IRC Pathway Programme Webinar - YouTube

Find out more at: <u>SFI-IRC Pathway Programme</u> Or https://www.sfi.ie/funding/funding-calls/pathway

#### **Key Dates**

The 2022 SFI-IRC Pathway Programme will have two deadlines.

- Notification of Research Body's approved candidates: **22nd July 2022**, **13:00h** (**local time Dublin, Ireland**)
- Full-proposal deadline: 14th September 2022, 13:00h (local time Dublin, Ireland)



## <u>The Institute of Chemistry of Ireland</u> <u>Irish Young Chemists' Network (IYCN)</u>

After the ICI Postgraduate Chemistry Research Symposium held online in September 2020 was a success, an idea was put forward to establish an Irish Young Chemists' Network (IYCN) as part of the Institute of Chemistry of Ireland (ICI). This initiative was highly welcomed and encouraged by both the postgraduates in attendance of the online symposium and approved by the ICI Council Members during their Council meeting on the 1<sup>st</sup> October 2020.

The committee of the online research symposium was made up of postgraduate students from various institutions in Ireland. As this committee worked in great harmony together, and had already established connections while organising the symposium, it was suggested to keep this committee for the IYCN. The members were all happy and motivated to be part of the IYCN committee. Together, we have summarised some of the benefits of establishing the Irish Young Chemists' Network to include:

- 1) Community, network and connection of young chemists
- 2) More opportunities for collaboration between early stage researchers
- 3) Organisation of conferences and events for young chemists
- 4) Opportunity for postgraduate students to present and discuss their work
- 5) A platform to promote upcoming positions suited for young chemists

The committee feel strongly about the first benefit especially during these times. We feel that the mental health of young chemists, including postgraduate students, is critical and essential. A sense of community and closeness, particularly during moments like these, would surely be beneficial to their mental health. As the chair of the committee, I will work together with the wonderful team of postgraduate students to establish the IYCN, while liaising and updating the ICI Council periodically as well as continue to avail of their expertise and support.

#### Mark Kelada, B.Sc. MICI Ph.D.

ICI Young Chemist Representative and Chair of Irish Young Chemists' Network



Are you a chemist in Ireland aged between 18-35 years old? Want to be part of an exciting new network of young chemists and be part of a growing community? Join us today by emailing <u>youngchemists@instituteofchemistry.org</u> with your name, age, and where you study or work. If your institution is not listed below, you could even be part of our incredible committee.

Name	Position	Representation
Colm McKeever	Chairperson	MU
Jessica O'Neill	Secretary/Vice Chair	DCU
Joseph Byrne	Advisor (Non-Voting)	NUIG
Liam Fitzgerald	Treasurer	NUIG
Siobhán O'Flaherty	PRO	RCSI
Ciara Davis	PRO	TUS
Nicolás Rojas Sanabria Committee Member		UL
Cathal Kelly	Committee Member	QUB
Hong Ann Gan	Committee member	TUS
Sean Byrne	Committee member	UCD

New Committee 2022:



#### The Institute of Chemistry of Ireland's YOUNG CHEMISTS' NETWORK

On March 8<sup>th</sup> 2022, International Women's Day, the Young Chemist's Network assembled a panel consisting of inspiring women from a broad range of chemical disciplines. During the 90 minutes, panellists all gave brief presentations on their journeys through STEM as well as personal anecdotes which varied massively, showing the many different pathways that can be taken throughout academia.

#### ciaracia



Young Chemist's Network Vice chair and Secretary Jessica O'Neill kicked off the event with a welcome to all in attendance. Following the introduction, Dr. Michelle Browne gave a presentation on her research journey of electrochemistry from Dublin City University to now beginning her own research group based in Berlin, Germany. Following Dr. Browne was Dr. Clare Mahon whose story was entirely different. Beginning in Newcastle, travelling to Australia, panicking about postdoc positions and returning to Durham, Dr. Mahon's story gave a lot of hope to postgraduates coming to the end of their PhD journeys that things will work out.

Dr. Roisin O'Flaherty gave another insight with the industrial experience she gained after her PhD in NIBRT and then taking a risk to return to Maynooth for an Assistant Lecturing position. Final, Dr. Susan Fetics, a founding member of Women in Research Ireland, gave us an overview of her journey from a bachelor's in chemistry and French, to moving to France then Ireland, leaving the lab for a more science communications role.



Following the presentations, there was a panel discussion where participants were invited to ask questions. Topics ranged from how to get through tough patches of PhDs/ postdocs to how do you balance being a mother and having a career. Panellists had open and honest discussions which the participants which lead to some amazing advice and thoughts to ponder for everyone in attendance.

To close the event, Niamh O'Dwyer from Berkley recruitment gave a brief presentation on the importance of having a tailored CV, of knowing the market and how recruitment agencies should most certainly be your friend.

Some take away messages from the event were;

- be brave and take a chance
- remember your "why", even when the times get tough
- mentors and support systems are vital to success

Thank you to our panellists and all those in attendance for making it such a successful event.

Ciara Davis



Credit | ETUC

## Institute of Chemistry of Ireland Statement in Support of the People of Ukraine

The Institute of Chemistry of Ireland, the national body representing all chemists in Ireland, is deeply saddened at and fervently condemns the military invasion by Russia of Ukraine. The Institute stands in solidarity with the people of Ukraine including the members of the National Academy of Sciences of Ukraine and wider educational and scientific communities.





## **European Young Chemists' Award**

The aim of the European Young Chemists' Award (EYCA) is to showcase and recognize the excellent research being carried out by young scientists working in the chemical sciences. In particular the award is intended to honour and encourage younger chemists whose current research displays a high level of excellence and distinction. It seeks to recognize and reward younger chemists of exceptional ability who show promise for substantial future achievements in chemistry-related research fields.

The European Young Chemists' Awards (EYCA), which are sponsored by the Società Chimica Italiana (SCI) and the European Chemical Society (EuChemS), are given every two years during the <u>EuChemS Chemistry Congress</u>.

## EYCA 2022

The call for the European Young Chemists' Award (EYCA) is currently open. You have until Thursday 30 June 2022 (20:00 CEST) to submit a nomination:



# mya

# One reaction station with limitless possibilities

- 4 independent zones
- Magnetic and overhead stirring
- -30 °C to +180 °C
- 2 ml to 400 ml
- Software control







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## MSMLG 2022 - July 12th - July 15th 2022 Register now @ the Early Bird Rate

Reconnect with your colleagues at the MSMLG 2022 conference, Dublin, Ireland. Registration is now open with Early Bird reduced rates available until 14th April 2022.

Along with the conference registration you can book your accommodation, social events and tours.

Visit the conference website <u>msmlg2022.org</u> for further details.

## **REGISTER NOW**

## Call for Oral Abstracts Deadline 25th March 2022 Call for Poster Abstracts Deadline extended to April 2022

A gentle reminder that our Call for Abstracts will close on 25th March 2022. The oral and poster presentation sessions are an opportunity to share research, learn new concepts, network and exchange ideas, and stay current on relevant information. Research presented should pertain to the theme of the conference: "Sensors, Molecular Logic Gates, Imaging". The deadline for oral abstract submissions is 25th March 2022 after which date the oral abstracts will go for review, poster abstract submission will close in April 2022.

**Click here for futher information on our Call for Abstracts** 

## Speaker Announcement coming soon ......

#### We look forward to welcoming you to Dublin at the 7th International Conference on Molecular Sensors and Molecular Logic Gates!

#### Follow us on social media to stay up to date



Welcome to the official website of the 7<sup>th</sup> International Conference on Molecular Sensors and Molecular Logic Gates (MSMLG 2022).

MSMLG 2022 will take place in the Radisson Blu Hotel, Dublin, Ireland from Tuesday 12<sup>th</sup> July 2022 to Friday 15<sup>th</sup> July 2022.

MSMLG 2022 will provide a venue for sharing ideas and experiences together with opportunities for researchers in the fields of chemosensors and molecular machines to meet in person.

Dublin offers a rich cultural heritage that brims with history and art, complemented by an impressive range of restaurants, cafés, and shops. Supported by a solid reputation for education and innovation, the city has become the centre for many of Europe's leading institutions.

Ireland's scenic coastlines and picturesque mountains encompass Dublin, providing visitors both modern and ancient experiences for a memorable adventure.

Feicimid i mBaile Átha Cliath 2022! (See you in Dublin 2022)



#### **Professor Thorfinnur Gunnlaugsson** *Local Host Trinity College Dublin, Ireland*

#### MSMLG 2022 Registration & Honorary Symposium: Prof A.P. de Silva

Through the online registration form you will have the opportunity to book your conference registration, accommodation, social events, optional tours all through the one online form. For any queries regarding registration, socials, tours and accommodation, please email registration@msmlg2022.org. Subject to availability delegates can re-access their booking and add items at a later date. Further information on modifying your booking is included in your confirmation email.

MSMLG 2022 REGISTRATION FEES	EARLY BIRD REGISTRATION	LATE REGISTRATION
	Available until 29th June 2022	Available from 30th June 2022
Academic Fee	€545.00	€625.00
Industry Participant	€675.00	€755.00
Student Fee	€375.00	€455.00
Thursday 14th July at 14:00 – Professor A.P. de Silva Honorary Symposium	€80.00	€80.00

#### **Register here:** <u>Registration – MSMLG 2022</u>

# Irish University & 3<sup>rd</sup> Level Chemistry News

Note:

The source material for the following section is provided by the relevant educational institutions. I will be endeavouring to improve this section of ICN by seeking timely updated feeds from the institutions.

I have reached out to heads of chemical sciences departments but the response has been poor. This is likely due to the pressure on everyone in chemistry departments. I ask Heads of Chemistry Schools/Departments to check their junk mail boxes and mark my email:

editor@chemistryireland.org as safe or never block sender!

Lot of goals and good achievements are being attained but we need to hear about them.

I can only include your good stories if you send them to me as they happen and I can coordinate them for inclusion in the next Issue of ICN which will be June 2022. These news items don't have to be long, even a paragraph can be useful and photos of high achievers or accomplishments and events are welcome.








Newest TU Name unveiled – ATLANTIC TECHNOLOGICAL UNIVERSITY GMIT, IT Sligo and LYIT (CUA) to become:

### **Atlantic Technological University** in Spring 2022

The Minister for Further and Higher Education, Research, Innovation and Science Simon Harris has today (Tuesday 23 November 2021) announced the name of the TU in the west and north-west as Atlantic Technological University (ATU).

"Atlantic" conveys power, strength, inspiration, creation, vast horizons – distinctive geography, rich history and shared heritage. This is a hugely ambitious name for a TU with an international reach without borders on the edge of Europe, spanning thousands of kilometres of coastline including the Wild Atlantic Way, a gateway to the rest of the world.

The name was chosen following an independent process of engagement by marketing and brand consultant company McCann (Dublin) who conducted surveys and online consultation with staff, students and stakeholders across the region and nationally.



Minister Simon Harris says: "I am pleased to be able to announce the name of Ireland's fourth technological university and that, subject to the relevant legislative processes being completed, the date of IRISH CHEMICAL NEWS ISSUE NO.2 MAY/ JUNE 2022

establishment of the Atlantic Technological University shall be 1 April 2022. This means that students of the current three Institutes who graduate in this academic year of 2021/2022 and henceforth in the west and north-west will do so with university qualifications."

Commenting on the final choice, David Wall, Design Director, McCann, says: "The name Atlantic Technological University reflects the deep connections in the region and the ability and ambition to impact at a national and international scale. It expresses a sense of place, incorporating aspiration, scale and geography. It speaks to our unique perspective as an island in the Atlantic Ocean that makes waves on an international stage. The new TU's name was chosen through extensive research and consultation with students, staff, and stakeholders across industry and education."

Over 3,000 students, staff and external stakeholders were surveyed by the company as part of the naming process, including public bodies, government agencies, professional bodies, community, alumni and schools' guidance counsellors.

Following extensive consultation, a shortlist of names was produced and discussed with the Department of Higher and Further Education and Minister Harris resulting in the chosen name – Atlantic Technological University.

Commenting on the name, the three CUA Presidents, Dr Orla Flynn (GMIT), Dr Brendan McCormack (IT Sligo) and Paul Hannigan (LYIT) said: "We are delighted that Minister Simon Harris has announced that Atlantic Technological University will be the name for our TU. Our university will significantly contribute to the transformation of the educational landscape of this region, driving innovation, research and development and propelling the region on to an international stage."

The three institutes – GMIT, LYIT and IT Sligo – situated on the western and northwestern seaboard stretching from North Donegal to South Galway, will see their eight locations become ATU campuses from 1 April 2022.





### **University of Limerick Chemistry Ranking**

### **Top scientists**

Position in the ranking is based on each scientist's h-index using data compiled from Microsoft Graph by December 6th 2021.

This ranking lists all top researchers from the Chemistry discipline and affiliated with University of Limerick. There are a total of 4 researchers included with 1 of them also being included in the global ranking. The total sum for the h-index values for top scientists in University of Limerick is 259 with a mean value for the h-index of 64.75. The total sum of publications for top scientists in University of Limerick is 1,047 with the mean value for publications per scientist of 261.75.

World National	Scholar	H-index	Citations	Publications
426 1	Michael J. Zaworotko University of Limerick, Ireland	102	48,966	448
4922 13	<b>Julian R.H. Ross</b> University of Limerick, Ireland	60	14,524	203
6346 17	<b>Gavin Walker</b> University of Limerick, Ireland	56	11,976	171
12669 36	<b>Åke C. Rasmuson</b> University of Limerick, Ireland	41	6,457	225

Our research was coordinated by Imed Bouchrika, PhD, a computer scientist with a well-established record of collaboration on a number of international research projects with different partners from the academic community. His role was to make sure all data remained unbiased, accurate, and up-to-date.

We list only scientists having Microsoft Academic Graph H-Index  $\geq$  40 within the area of Chemistry. If you or other scholars are not listed, we appreciate if you can <u>contact us</u>.



### The 73rd Irish Universities Chemistry Research Colloquium Preliminary Notice

The Irish Universities Chemistry Research Colloquium is run annually under the aegis of the Institute of Chemistry of Ireland.

**University College Dublin** will host the **73<sup>rd</sup> Colloquium** this year on the **15-16<sup>th</sup> June** as the first full face-to-face meeting of chemists on the Island since the Covid pandemic.

It will be hosted by the UCD School of Chemistry in the O'Brien Centre for Science.



Further details are coming soon. Check UCD and the Institute's web sites:

UCD School of Chemistry

Institute of Chemistry of Ireland (chemistryireland.org)



### **SEFS Student Nominated Staff Awards 2021**



Dr. Dave Otway, Dr. Tim O'Sullivan and Dr. Ian O'Connor from the School of Chemistry have been honoured in the SEFS Student Nominated Staff Awards for 2021.

Annually, SEFS ask all undergraduate students to participate in a survey asking them to nominate a SEFS staff member who went above and beyond to assist students. The categories students were asked to participate in were:

Academic Staff Member

Technical Staff Member

Professional Services Staff Member

Undergraduate Demonstrator

Congratulations to the full list of award winners. The awards ceremony took place on Tuesday March 17th.

Category	Staff	Area	
Academic	Winner: David Otway	School of Chemistry	
	Runner-Up: Tim O'Sullivan	School of Chemistry	
	Runner-Up: Jens Walter	School of Microbiology	
Technical	Winner: Carmel Shortiss	School of Microbiology	
	Runner-Up: Ian O'Connor	School of Chemistry	
Professional Services	Winner: Mary McSweeney	School of Biological, Earth and Environmental Sciences	
	Winner: Yvonne Brennan	School of Biochemistry and Cell Biology	
Undergraduate Demonstrator	Winner: Jane Dooley	Department of Physics	



### **Chemical Sciences Research**

#### Overview

The School of Chemical Sciences houses a suite of state-of-the-art research equipment including high resolution electron microscopy and a range of both mass and magnetic resonance spectrometers. It is one of the most successful Chemistry Schools in Ireland for attracting large-scale research funding, with our researchers having significant roles within a number of recently established, nationally significant research centres, including pharmaceutical science, biomedical diagnostics, biofermentation process analysis, separation science, and marine monitoring.

#### **Research Themes**

The School of Chemical Sciences is a research intensive department with three primary themes (T1 - T3) that span key areas of research of national and international significance. These include climate and environmental research, nanomaterials and devices, and therapeutics and diagnostics. Underpinning these three themes lies core academic expertise in the areas of synthetic, medicinal, physical, nanomaterials, bioinorganic, and analytical chemistry. To learn more about our activities and the researchers involved in each theme click on the images below.



#### T1: Climate Action: Energy, Water & Sustainability

The School of Chemical Science hosts an array of environmental research relating to climate, water, soil, atmospheric science, chemical ecology, green technology and pollution. Much research is based on analytical method development and the development of intelligent analysis tools to monitor and improve our environment. For example, novel materials are developed for the extraction and enrichment of analytes and the removal of pollutants from industrial waste water streams and sensors are designed and deployed to monitor marine and freshwater conditions. Technology to detect emerging contaminants in

air, water and soil such as phthalates are developed by multiple research groups within the School. An umbrella for much is this research is provided by the Water Institute (https://dcuwater.ie/). Marine and terrestrial ecosystem health is investigated through innovative approaches such as the combination of analytical chemistry with state of the art geographical surveys. This technological approach is employed to study areas such as soil and pollinator health. We study the atmosphere through aerosol characterisation and investigations of the contents of the air we breathe. Ongoing research seeks to breakdown greenhouse gases such as  $CO_2$  for use and we develop green technology that enables industry to be more sustainable. Carbon is essential for life and has many forms in nature. We study carbon in soil, water and coastal sediments and employ novel approaches to investigate subjects such as past environments on Earth, the recycling of waste and the search for extra-terrestrial life.

#### **T2: Advanced Materials & Devices**

The SCS supports a wealth of research in the area of advanced materials and their integration into devices designed for environmental and health diagnostic applications. Bioinspired material design and supramolecular chemistry are strong themes within the School where diverse materials science is applied for example to design responsive biointerfaces for sensor and drug delivery platforms, catalytic materials for energy production and luminescent probes for high precision cellular targeting and imaging. The SCS plays a key role in the National Centre for Sensor Research (www.ncsr.ie) at DCU which brings together advanced materials science research activity together with other Schools with the objective of meeting sensor design challenges such as integration of sensing interfaces with functions such as fluidic handling, engineering architectures and properties in novel materials for biosensor and bioelectronic applications, as well as meeting device sensitivity challenges related to analyte detection in marine water for example and early detection of disease biomarkers in blood.

Broader than this, the SCS hosts funded materials chemistry research programmes centred around topics including the engineering of nano- and micro-patterns of soft polymers with responsive properties, the synthesis and photochemistry of materials with antimicrobial properties, conjugated polymers as hydrogen evolution catalysts, the design of carbon nano-onions for catalytic and sensing applications, and electrode material design for wireless electrochemiluminescence and cell stimulation.

#### **T3:** Therapeutics & Diagnostics

The School of Chemical Science hosts an array of active research in the fields of Therapeutics and Diagnostics. In the area of nanotechnology and imaging, our department has expertise in developing precision targeted probes for sensing of proteins, metabolites, structure and (super resolution) imaging in live cells and tissues. This expertise provides insights in metabolism, cell health, disease and therapy biocompatable platforms for surface enhanced Raman studies of protein, cells and exosomes; and metal enhanced fluorescence. The department also focuses on nanomaterials chemistry for biomedical applications. This work primarily focuses on the synthesis of imaging probes for cancer cells and bio-inspired functionalization of nano-onions for drug delivery.

Our School has state-of-art expertise in photocatalytic materials to target antimicrobial resistance and in the generation of renewable fuels. This work is centred on bimetallic photocatalyst synthesis, photophysics of ruthenium compounds, and understanding the mechanisms for photocatalyzed hydrogen generation. Principal investigators in the department are also working to develop new therapeutics for the treatment of multiple sclerosis. In this research programme, green synthetic technologies and the development of new energy efficient continuous flow photochemical reactors for application in chemical synthesis are applied.

The department has extensive experience in inorganic and medicinal chemistry research which extends to metallodrug / metallopharmaecutial design, artificial gene editing, therapeutic oligonucleotide drug development, and in understanding and uncovering new metallodrug-DNA interactions.

In this research theme, the department has active computational chemistry research that focuses on modelling the stability and properties of pharmaceutical solid forms and the development and application of new DFT approaches (e.g. PBE+MBD). This research is applied to polymorphism and structures of molecular crystals and also mechanical properties of API solid forms.

# New South East Technological University will be formally established in May 2022



Waterford Institute of Technology





### **Prof Veronica Campbell designated as South East Technological University's first President**

28 April 2022



The Minister for Further and Higher Education, Research, Innovation and Science, Simon Harris yesterday designated Prof Veronica Campbell to be appointed first President of South East Technological University (SETU).

The Minister for Further and Higher Education, Research, Innovation and Science, Simon Harris yesterday designated Prof Veronica Campbell to be appointed first President of South East Technological University (SETU).

Prof Campbell's appointment as SETU President will be put forward for ratification by the new university's governing body at its first meeting on establishment day this Sunday, 1 May 2022.

Chairperson Designate of the Governing Body of SETU, Prof Patrick Prendergast warmly welcomed Prof Campbell's appointment. "This is a truly exciting time for the south east of Ireland. This Sunday we will

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have achieved our long-standing ambition to deliver a university for and of the region. And today I'm particularly delighted to welcome Prof Veronica Campbell as first President of what I know will be an ambitious and innovative technological university.

"Prof Campbell comes to us with years of experience in senior academic and management roles in higher education in Ireland and abroad. She will bring an energy, vitality and leadership to the role and drive our ambition to be a leading European technological university."

Prof Veronica Campbell holds a degree in Pharmacology from the University of Edinburgh and a PhD in Neuropharmacology from the University of London. She was awarded a Health Research Board postdoctoral fellowship in 1996 and was appointed to an academic post in the Department of Physiology, School of Medicine at Trinity College Dublin in 1998. Prof Campbell has extensive undergraduate and postgraduate teaching experience and a productive research record in cell biology, pharmacology and tissue engineering.

She has held several senior leadership roles in Trinity College, including Dean of Graduate Studies and Bursar & Director of Strategic Innovation; in the latter role from 2015 to 2021 Prof Campbell oversaw the commencement of a €300M capital project portfolio in the university.

Prof Campbell currently serves on the Board of the Atlantic Institute, based in Oxford University, and was the inaugural chair of the Global Brain Health Institute of Trinity College and UCSF. She is a former President of the Royal Academy of Medicine in Ireland (Biomedical Sciences Section).

On Sunday, 1 May 2022, South East Technological University (SETU) will be formally established. SETU will officially celebrate its launch in September in a ceremony to mark the university's first academic year and the first intake of university students presided over by our TU's first President, Prof Campbell. This will be a celebration to include staff and students, our stakeholders and collaborators, higher education colleagues and all our supporters from across the region and wider networks.



# Ministers Harris and Foley announce investment in 4 TU Dublin projects to help public understanding of STEM

#### The funding is provided via the SFI Discover Programme

1 June 2022

Minister for Further and Higher Education, Research, Innovation and Science Simon Harris, and Minister for Education Norma Foley TD have announced an investment in four TU Dublin projects to improve public understanding of science, technology, engineering and maths (STEM).

The SFI Discover Programme funding of  $\notin$ 400,000 will encourage diversity and inclusion in STEM, while also targeting a wide range of ages, including young children, teens and adults.

#### Announcing the funding, Minister Harris TD said:

"I am delighted to announce today the 47 projects receiving funding through the Science Foundation Ireland (SFI) Discover Programme.

"These projects will have an invaluable impact, starting conversations about the role of STEM in society and inspiring our young people to explore careers in these areas.

"Through initiatives such as the SFI Discover Programme, we must support the public to have access to, and understand, the issues that impact our collective future, and the role science and technology can play in providing solutions. I wish all the recipients every success in the rollout of their projects." Speaking of the projects co-funded by the Department of Education, **Minister Foley** said: "We are pleased to collaborate with the Department of Further and Higher Education, Research, Innovation and Science by supporting five projects that will receive funding through the SFI Discover Programme.

"These projects are designed to grow and encourage participation in STEM education and public engagement, inspiring our young people to explore STEM roles in the future. I want to congratulate all of the individuals and teams involved in their work to date on these projects." The projects funded by TU Dublin are:

### **CS\_LINC - Bridging the gap to Formal Computer Science Education (Co-funded by the** <u>**Department of Education</u>**)</u>

#### Project Lead: Dr Keith Quille

CS<sub>LINC</sub> will provide formal Computer Science (CS) curricula through equitable online modules that provide long-term exposure to CS. As part of the Leaving Certificate Computer Science (LCCS) <u>framework</u>, the Department of Education and Skills identified that building capacity for Computer Science amongst teachers and students was a significant barrier to the future success of the subject. Using a suite of free targeted supports, CS<sub>LINC</sub> is building student and teacher capacity for progression into LCCS and for Youth Reach Post Leaving Certificate courses.

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CS<sub>LINC</sub> is an online student learning environment for Computer Science consisting of several modules built upon international best practices with varying collaborators, tailored to Irish second-level students. It is free to use and mobile-friendly, so schools don't need a fully equipped computer lab to use the platform. Each module consists of lesson plans, PowerPoint presentations, videos, homework and solutions for teachers, providing a full suite of online tools to deliver successful introductory Transition Year, Junior Cycle and Youth Reach Computer Science courses. There is also an automated assessment where students take a pre-created quiz that is graded automatically, and successful students will receive a certificate of completion from TU Dublin for each module they pass.

#### Fiosracht in the Classroom - The STEMPATHY Journey Project Lead: Dr Gerard Ryder and Lucy McAuley

Fiosracht in the Classroom (FiC) provides an immersive experience of STEM delivered through a unique journey in which students and teachers in primary school learn about the relevance of science and technology in their world. This is the STEMpathy Journey, a student-centred, cross-curricula, design thinking process with five distinct stages: DEFINE, EMPATHY, IDEATE, PROTOTYPE and SHARE. Children use compassion, storytelling, creativity, art and communication skills to develop innovative solutions to everyday problems. Students showcase their work at the end of their journey and become ambassadors for STEM who excite and engage their community on how STEM can enhance society. Fiosracht in the Classroom has been piloted in a number of schools in Lucan and Tallaght and identified a number of barriers to widespread adoption of the programme. This project will develop a teacher training programme and a community of practice to support teachers as they guide their students on the journey and provide a mechanism for network development and process evolution.

#### TRY FIVE (Biology, Engineering, Chemistry, Electronics & Microscopy) Project Lead: Riona Fitzgerald

The Try Five STEM Project aims to provide pupils in DEIS schools with hands-on experience of STEM activities to improve their understanding of STEM, its applications to everyday life, and in their future careers. To do this, TRY FIVE will deliver 60 workshops to 250 fourth class students across five different STEM-related areas (Biology, Engineering, Chemistry, Electronics and Microscopy). The SFI Discover funding will be used to determine the project's success and establish if participants experienced a shift in attitude towards STEM subjects in terms of confidence gained, increased knowledge and understanding of their potential, and improved skill levels.

#### Happy Maths, fighting Maths Anxiety with Game-based Learning Project Lead: Dr Pierpaolo Dondio

Happy Maths is a programme for primary school students, teachers, and parents to raise awareness about Maths Anxiety and how game-based learning can mitigate its negative effect. Maths Anxiety is "a debilitating negative emotional reaction towards mathematics", affecting one in six students. It is more severe in girls than boys, thereby worsening the existing problem of gender inequality in STEM education.

Happy Maths has two aspects. One is for pupils, consisting of a 5-week-programme where they engage with educational digital games for Maths. The aim is not only to increase their Maths cognitive abilities but specifically to use the power of games to engage disadvantaged and anxious pupils to mitigate the negative effects of Maths Anxiety. The second aspect is for teachers and parents and includes workshops for teachers to facilitate their independent adoption of game-based learning in the classroom. The uniqueness of Happy Maths is that the games were entirely developed by TU Dublin researchers. In the first half of 2022, the Happy Maths project visited about 40 classrooms in County Dublin, Meath and Kildare, and more than 1000 students had already participated.

Read more about the announcement here.



### **Post Graduate Awards 2022**



Prof. Frances Heaney and Dr. Diego Montagner pictured with the BOC postgraduate awardee Mr. Conor Wynne

The Department of Chemistry is delighted to congratulate three of our postgraduate students on their recent awards. The awards consisted of the annual BOC award which is presented to a 3rd or 4th year PhD student who has demonstrated excellence during their PhD studies. In addition postgraduate awards were were presented to recognise the important contributions that the postgraduate students make to the department. These include the following:

Chemistry Postgraduate Research Award Chemistry Postgraduate Teaching Award



Mr. Conor Wynne, who is part of Dr Rob Elmes' team received the BOC Award. The Chemistry Postgraduate Research Award was presented to Mr. Carl Fogarty who is part of Dr Elisa Fadda'a team. The Chemistry Postgraduate Teaching Award was presented to Ms Caytlin Boylan, a member of Prof John Lowry's research group.

Congratulations to all.



### **TUS: Midlands Midwest**

### **Our Story**

(Merger of AIT & LIT)

With over 14,000 students on six campuses in Ireland's Midwest and Midlands, TUS is one of Ireland's newest and most unique Technological Universities. Through applied learning and fresh thinking, our focus is on meeting the evolving needs of society and industry, within our region and beyond.

Find out how shared values and a belief in the power of applied learning laid the foundations for TUS

### TUS – shared values and proactive thinking

At TUS we have a clear focus on meeting the evolving needs of society and industry through applied learning and innovative thinking. By putting the individual needs of our students front-and-centre, we prioritise accessibility and opportunity for all. When we combine this student-first philosophy with next-generation thinking, we can help drive our region forward through education, research, and commercial collaboration.

#### **Our Story**

TUS is a multi-campus university spread across six colleges throughout Ireland's Midwest and Midlands region. With principal campuses at Limerick and Athlone, we benefit from an already strong and vibrant history of education and learning in the wider region, and look forward to playing our part in sustaining and enhancing this identity for generations to come.

By providing a healthy supply of high-quality graduates and an additional focal point for growth and innovation, we can help regional development take a big step forward. And for our nation, a technological university in the heart of Ireland adds a new dimension to education in our country, demonstrating a commitment to shared values like inclusivity, accessibility, and supportiveness.

Our continuous focus on partnership, innovation and staying agile shows we understand the importance of working with key stakeholders across industry and society. And with more than 14,000 students enrolling in hundreds of courses every year across four counties, our story has only just begun.

#### More Information at: Home - TUS



### **DkIT Articulates Vision To Join a Multi-Campus Regional Technological University By 2023**

23 April 2021



A new vision statement published today by Dundalk Institute of Technology (DkIT) outlines the Institute's clear ambition and strategic intent to achieve Technological University (TU) status by 2023, which will involve a Joint Application with a TU under Section 38 of the Technological Universities Act 2018.

The statement was shared with all staff at a consultative briefing today and has been ratified by the DkIT Governing Body. It promotes a unified agreed approach in delivering on the strategic goal and its unequivocal commitment to achieving TU designation by becoming a campus of a multi-campus Regional TU.

The statement provides an overarching vision for all stakeholders as the institute embarks on this new evolutionary period. It identifies the benefits of becoming part of a TU, demonstrating a commitment to becoming part of a single cohesive, integrated and unitary multi-campus TU. It also outlines DkIT's strong position in respect of TU metrics performance, financial sustainability and as a driver for regional economic growth, making it an attractive partner.

Speaking today, DkIT President, Michael Mulvey, PhD, said,

"As an institute we have a clear vision to become part of a Technological University within the lifetime of the Strategic Plan 2020-2022. Over recent years, we have consistently espoused the belief that our region would gain significantly from being a TU campus from an economic, social and cultural perspective. Our vision statement released today helps articulate what a campus of a multi-campus regional TU will look like for DKIT and it outlines some of the key shared values and attributes we will seek in a partnering with a TU.

We welcome the continued support from the HEA and the Governing Body and we look forward to continuing our engagement with potential partners in the sector to realise our ambition to become a campus of a multi-campus regional TU, serving North Leinster South Ulster."

#### Mr Paddy Malone, Chair of the DkIT Governing Body added,

"We welcome the publication of the institute's vision, noting that the GB played an integral part in its development, which is a critical step in ensuring that its ambition to become a campus of a multi-campus regional Technological University here in Dundalk soon becomes a reality. As a Governing Body, we are committed to fully supporting the institute to achieve its ambition of technological university status – something which we recognise is of fundamental importance to DkIT leveraging the M1 Corridor, Cavan and Monaghan and ensuring it reaches its potential for the benefit of students, staff and the wider community."

At the briefing with staff, the institute reflected on the significant progress that has occurred to date in relation to achieving TU designation. The institute has already attained two of the three requisite quantitative metrics to meet eligibility requirements to become part of a TU, which is a highly positive attribute that it can offer potential TU partners. These metrics include:

• **30%** of all DkIT students now participate in work placement as part of their academic

careers (achieved in 2020/21)

• 90.7% of core academic staff have a Masters Qualification and 46.75% have a PhD or

Professional Qualification (achieved in 2020/21)

• 4% of students enrolled in Masters and PhD research programmes (expected to be reached in

#### academic year 2021/2022)

In 2020, the HEA agreed to support a progression pathway to facilitate DkIT's TU ambitions. This included the appointment of Dr Ruaidhri Neavyn as an advisor to the Governing Body, President and Management of the Institute. In addition, DkIT has been successful in accessing Technological University Transformation Funding (TUTF) and it has established a new TUTF Steering Committee comprised of staff, students and wider stakeholders which has helped accelerate plans, as well as establishing a Governing Body Technological University Oversight Committee.

Speaking today, Dr Ruaidhri Neavyn, HEA Advisor added,

"The HEA recognises the important contribution DkIT has made to the development of its region. We are committed to doing as much as possible within existing legislative and funding frameworks to support the institute's TU ambitions. The institute has set out a realistic plan and we are supportive of its vision and ambition to be a campus of a dynamic multi-campus regional TU."







### CCE Academic Appointed as Associate Editor of Leading Sustainable Chemistry Journal

Dr Andrew Marr, Senior Lecturer at the School of Chemistry and Chemical Engineering, has been appointed Associate Editor of the leading journal ACS Sustainable Chemistry & Engineering.



Dr Andrew Marr has been appointed Associate Editor of the ACS Sustainable Chemistry & Engineering journal.

Published by the American Chemical Society, the journal publishes articles which are focused on the ongoing drive to increase sustainability in a range of areas. The journal is widely renowned, with an impact factor of 8.198 in 2020.

Dr Marr's role as Associate Editor includes managing the editorial process for manuscripts in the editor's area of expertise, providing guidance to assist the development of the journal, and providing advice on how the journal can best serve the research community.

Speaking of his appointment, Dr Marr commented:

"I am delighted to be appointed as an Associate Editor, as this is one of my favourite journals. This is an ideal opportunity to contribute to the global community of green & sustainable chemists and chemical engineers."

Professor Steven Bell, Head of the School of Chemistry and Chemical Engineering, added:

"I'd like to congratulate Andy on this significant achievement on behalf of the whole School. This is recognition from the community of Andy's depth of knowledge and expertise in what is a hugely important area, not just for the School, where Sustainability is a major theme, but for the future of the whole discipline."



# Scientists create luminescent gels with multitude of applications from counterfeiting to bio-sensing

#### 31 May

Trinity scientists have taken inspiration from nature to create luminescent, self-healing gels with a suite of potential applications ranging from bank note counterfeiting to next-gen bio-sensing and imaging.

Crucially, the scientists have been able to introduce guanosine (a molecule that plays many important metabolic roles in our cells) into these gels, and add other molecules that can do exciting things from a materials and biological sciences perspective. One such addition to these gels is that of lanthanide ions, which possess unique properties including luminescence, magnetism and the ability to speed up specific reactions. The study was <u>published</u> in the recent edition of the high-impact *Cell Press* journal *Chem*.

Guanosine gels exhibit chirality (left-handed helicity in this case) and the scientists focused on transferring that characteristic to the lanthanide elements of the gels once those ions had been added.

Although that may seem like just one more simple step in the chemical recipe, it is a leap that opens doors to a multitude of new applications as it means these gels can accurately signal varying intensities of whatever they are designed to sense.

From a medical perspective that could mean accurately detecting the presence—and amount—of a biomarker of interest, for example. But the possibilities are so plentiful that the team must now take time to assess which direction to take their research next.

Oxana Kotova, Research Fellow in Trinity's School of Chemistry and AMBER, the SFI Centre for Advanced Materials and BioEngineering Research, is first author of the published study.

**Dr Kotova**, who is based in the School of Chemistry, located in the Trinity Biomedical Sciences Institute (TBSI), said:

We are interested in developing supramolecular hydrogels like this as they open so many doors to new applications in various fields from biological to material sciences. By transferring chirality onto the lanthanide elements of this gel, we have been able to modify the chiral luminescence response of the latter, which can aid future understanding of recently discovered lanthanide biological functions as well as help the development of future generation sensors and imaging agents. We think it is fascinating that such options arise from a new material that was itself created by taking inspiration from biology.

**Thorfinnur Gunnlaugsson, Professor of Chemistry in Trinity's School of Chemistry and AMBER**, and based in TBSI, is the senior author of the research article. He added:

The idea that Oxana had here was to use bio-inspired DNA building blocks to generate luminescent responsive soft-material that not only is emissive under light irradiation, but also self-healing, which itself can lead to various applications, such as in responsive ink printing. Furthermore, the material presented in this Chem article, gives rise to the chiral-based emission upon irradiation of visible light. This means that using a technique called circular polarised luminescence (CPL), we can observe either the 'right or the left handed' (e.g. the polarised) emission from the material. The use of this spectroscopic technique is fast becoming apparent and its use in chemical and biological research is finding its niche. This has significant consequences for the potential applications of lanthanide based bio-inspired soft material, such as for monitoring biological processes, in live cellular imaging, and in drug delivery, to name just a few. The CPL technique is also important means of developing 'responsive' counterfeiting inks for use in printing of bank notes, labels, etc. Hence, the opportunities here are vast for future developments, and we are excited to be part of this important finding, which was only made possible with the coming together of leading research groups with strong expertise.

This research was funded and supported through research funding from Science Foundation Ireland (SFI, Principal investigator funding) and through the SFI-funded AMBER Centre, which both lead authors are members of.

The work is an outcome of an on-going collaboration between research groups from different disciplines and universities initially started with the synthesis of organic ligand by Dr. Ciaran O'Reilly (Department of Clinical Medicine, School of Medicine, TBSI). This ligand was then used to functionalise guanosine hydrogels and bind to lanthanide elements by Dr. Oxana Kotova.

While the principle luminescent properties were all studied in Trinity, the circularly polarised luminescence studies were performed by Dr. Lewis E. Mackenzie and Professor Robert Pal in the Department of Chemistry, Durham University, United Kingdom. The morphology of the gels was investigated by researchers within Professor Thorfinnur Gunnlaugsson's group in the School of Chemistry and Advanced Microscopy Laboratories in Trinity. The rheological properties of these luminescent gels were then examined through collaboration with Dr. Sebastian T. Barwich and Prof. Matthias E. Möbius from the School of Physics in Trinity, who are also members of the SFI funded AMBER Centre.

#### **More information**

The paper: *Lanthanide luminescence from supramolecular hydrogels consisting of bio-conjugated picolinic-acid-based guanosine quadruplexes* can be viewed <u>here</u>.



Kerry based researcher, Dr Joanna Tierney from the Dept of Biological and Pharmaceutical Sciences and Shannon ABC, Munster Technology University (MTU) Kerry Campus was presented with the MTU Commercial Invention of Year 2021 at this year's virtual ceremony. <sup>30 May</sup>



The MTU Invention of the Year awards is an annual event that takes place as part of Innovation and Enterprise month at MTU. The awards recognise and acknowledge the work and effort that staff have put into their invention declarations during 2021 and to encourage researchers to engage in the research commercialisation process. MTU researchers submitted 20 invention disclosure forms (IDFs) to the Innovation and Enterprise Office during this time period. The IDFs were judged by an external panel - Dr Declan Weldon, Director of Innovation and Engagement from University of Glasgow and Dr Paul Dillon, Director of Technology Transfer Office, from University of Limerick. Each submission was judged based on several criteria: scientific merit, innovative factor, development stage, potential benefit to society, marketability and patentability.

Dr Tierney's work on the control of coccidiosis in poultry, funded by an Enterprise Ireland Commercialisation Fund, earned her the award. Coccidiosis is caused by Eimeria protozoan parasites and is an important disease in poultry and neonates in animal farming. It causes diarrhoea, weight loss, emaciation, and in extreme cases, death. The invention employs natural, anti-parasitic, anti-microbial, immune-modulating and anti-oxidant activities as an alternative to the current industry treatments in use today for coccidiosis control.

Speaking about the award, Dr Tierney said "I'm delighted to receive this award, and I'm grateful to Enterprise Ireland, Science Foundation Ireland and MTU for their support over the last few years. I'd like to thank my colleagues at Shannon Applied Biotechnology Centre, the Department of Biological and Pharmaceutical Sciences, and the research office team in MTU. I would like to acknowledge and thank the people who I've worked with over the years on this project; Drs Michelle Ryan, Joanna Przyborska and David Kelly. Our work on developing an alternative coccidiosis control solution is critically important as poultry is set to become the world's most consumed meat protein and poultry producers face increased pressure to control this parasite disease which contributes to significant economic loss as reflected in poor weight gains and reduced feed conversion."

The Commercial Invention of Year award was presented to Dr Joanna Tierney recently by the President of MTU, Professor Maggie Cusack. Another award was presented at the ceremony for MTU Technical Invention of the Year 2021. This was awarded to the CAPPA (Centre for Advanced Photonics and Process Analysis) project, PIXCAN.





15 April 2022

#### Article on lectin-inhibitors published in ChemMedChem

Karolina and Joe's review article on "Structural considerations for building synthetic glycoconjugates as inhibitors for *Pseudomonas aeruginosa* lectins" has been published by *ChemMedChem*. The article is available here: https://doi.org/10.1002/cmdc.202200081



*Pseudomonas aeruginosa* is a pathogenic bacterium, responsible for a large portion of nosocomial infections globally and designated as critical priority by the World Health Organisation. Its characteristic carbohydrate-binding proteins LecA and LecB, which play a role in biofilm-formation and lung-infection, can be targeted by glycoconjugates. In the review, we present the wide range of inhibitors for these proteins (136 references), highlighting structural features and which impact binding affinity and/or therapeutic effects, including carbohydrate selection; linker length and rigidity; and scaffold topology, particularly for multivalent candidates. We also discuss emerging therapeutic strategies, which build on targeting of LecA and LecB, such as anti-biofilm activity, anti-adhesion and drug-delivery, with promising prospects for medicinal chemistry.

This article would be a good entry-point for any researchers considering tackling *P. aeruginosa* as a target organism, particularly if they want to build lectin-targeting ligands building on the existing consensus in the field on the best structural features to ensure high lectin affinity.

Thanks to Science Foundation Ireland for funding this research.

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### Scope

*PCCP* (*Physical Chemistry Chemical Physics*) is an international journal for the publication of cutting-edge original work in physical chemistry, chemical physics and biophysical chemistry. To be suitable for publication in *PCCP*, articles must include significant new physical insights; this is the prime criterion that referees and the Editors will judge against when evaluating submissions.

The journal has a broad scope which includes spectroscopy, dynamics, kinetics, statistical mechanics, thermodynamics, electrochemistry, catalysis, surface science, quantum mechanics and theoretical developments play an important part in the journal. Interdisciplinary research areas such as polymers and soft matter, materials, nanoscience, surfaces/interfaces, and biophysical chemistry are especially welcomed whenever they include a physico-chemical approach.

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## **Royal Irish Academy**

### Admittance Day 2022

19 May 2022



May 19<sup>th</sup> the Royal Irish Academy celebrated **Admittance Day** when 24 of our 29 newly elected Members were officially admitted to the Academy for their exceptional contributions to the sciences, humanities and social sciences, as well as to public service.

Newly elected Members include Hannah McGee, deputy-chair of the National Research Ethics Committee for Covid-19; psychologist Orla Muldoon, a regular op-ed contributor to *The Irish Times*; historian and pre-eminent authority on Catholic renewal Tadhg Ó hAnnracháin; Siobhán Mullally, UN Special Rapporteur on Trafficking in Persons; Virginia Teehan, Chief Executive of the Heritage Council; Marie Donnelly, Chair of the Climate Change Advisory Council; and Linda Doyle, 45th Provost of Trinity College Dublin.

Dr Mary Canning, President of the Royal Irish Academy, said: 'We are immensely proud of these 29 new Members who we are recognising today for their scholarly achievements, their research and international distinction or for significant contributions to Irish society. As new Members of the Academy, they will contribute to and strengthen our capacity to provide expert advice on Higher Education and Research policy.'

The 29 new Members of the Royal Irish Academy are:

Geraldine Boylan (University College Cork); Katherine Browne (University College Dublin); Mary Cannon (Royal College of Surgeons in Ireland, University of Medicine and Health Sciences); Karen Corrigan (Newcastle University); Mary Cosgrove (Trinity College Dublin); Rónadh Cox\* (Williams College); Marie Donnelly\* (Climate Change Advisory Council); Gary Donohoe (NUI Galway); Fiona Doohan (University College Dublin); Linda Doyle\* (Trinity College Dublin); Mary Doyle (Trinity Long Room Hub); Gladys Ganiel (Queen's University Belfast); Andreas Hess (University College Dublin); David Jones (Queen's University Belfast); Patricia Kearney (University College Cork); Mairead Kiely (University College Cork); JoAnne Mancini (Maynooth University); Hannah McGee (Royal College of Surgeons in Ireland, University of Medicine and Health Sciences); Niamh Moloney\* (London School of Economics); Orla Muldoon (University of Limerick); Siobhán Mullally (NUI Galway); Tadhg Ó hAnnracháin (University College Dublin); James P O'Gara\* (NUI Galway); Stefan Oscarson (University College Dublin); Ann Rigney (Utrecht University); Jane Roberts (University of London); David Stifter (Maynooth University); Virginia Teehan (Heritage Council of Ireland); Patrick Wyse Jackson (Trinity College Dublin) \* Cannot attend today's ceremony

There are 656 Members of the Royal Irish Academy including: Nobel Laureates William C. Campbell and John O'Keefe; Louise Richardson, Vice-Chancellor of the University of Oxford; Frances Ruane, economist; Philip Lane, European Central Bank; Fabiola Gianotti, Director General CERN; Brigid Laffan, Irish political scientist and Director of the Robert Schuman Centre for Advanced Studies; and Geraldine Byrne-Nason, Irelands Permanent Representative to the UN.

The Academy has been honouring Ireland's leading contributors to the world of learning since its establishment in 1785 and those elected by their peers are entitled to use the designation 'MRIA' after their name. Full citations are available in the <u>Admittance Day booklet(link is external</u>) at this link.

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### The Kathleen Lonsdale RIA Chemistry Prize

**The Kathleen Lonsdale RIA Chemistry Prize**, formally known as the Young Chemist Prize, was established at the Academy in 2000. Since its inauguration, the Royal Irish Academy works each year with the expert members of the Physical, Chemistry and Mathematical committee to select a winner based on **the most outstanding Irish PhD thesis in the general area of the chemical sciences.** 

The prize, kindly sponsored by Henkel, includes an **award of €2,000**. The winner will also be nominated by the Physical, Chemical and Mathematical Sciences Committee to compete amongst the top young chemists in the world in the **IUPAC-SOLVAY International Award for Young Chemists** 

Dr Priyanka Ganguly wins Kathleen Lonsdale RIA Chemistry Prize 2022





Dr Priyanka Ganguly, a recent PhD graduate of the Institute of Technology Sligo, has been awarded the 2022 Kathleen Lonsdale RIA Chemistry Prize for the best chemistry PhD thesis in Ireland. This prestigious prize is named in honour of the famous Irish x-ray crystallographer Kathleen Lonsdale and announced today to mark her birthday.

Dr Priyanka Ganguly, a recent PhD graduate of the Institute of Technology Sligo, has been awarded the 2022 Kathleen Lonsdale RIA Chemistry Prize for the best chemistry PhD thesis in Ireland. This prestigious prize is named in honour of the famous Irish x-ray crystallographer Kathleen Lonsdale and announced today to mark her birthday.

Dr Priyanka Ganguly's winning PhD research was work towards solving two fundamental challenges of the 21st century: sustainable energy production and environmental remediation of pharmaceutical effluents and antimicrobial disinfection. Her experimental work included the synthesis of novel nanomaterials and exploring their use as photocatalysts for hydrogen generation, degradation reactions and antimicrobial disinfection under visible light.

Dr Ganguly is currently working as a Marie Curie Early-Stage Researcher at the University of Glasgow. She described her reaction to the news that she had been selected for the Kathleen Lonsdale RIA Chemistry Prize 2022:

"I am extremely delighted to be the awardee from such a prestigious institution. Being recognised with such awards helps you to gain confidence to do better in upcoming years. Moreover, challenging situations of pandemics have made me realise the importance of science we do and the progress that we make each day for a better future. It is an extremely humbling experience to be recognised by such a prestigious institution as the Royal Irish Academy, as it recognises all the hard work being done to date."

IRISH CHEMICAL NEWS ISSUE NO.2 MAY/ JUNE 2022

Professor Christine O'Connor, TU Dublin, chair of the assessment panel for the prize, commended the quality of this year's competition entries:

"This years' Kathleen Lonsdale Prize applicants representing Universities/ Institutes across Ireland have been of an extremely high standard. To have such a high calibre of applicants following what has been a very disruptive time in their postgraduate research due to the pandemic, displays resilience and determination of both the Researchers and their Supervisors. The applicants demonstrated how their research aims to address global challenges and dissemination of the outputs in such high impact journals and scientific fora demonstrates Ireland as being world class in Chemical Sciences research." Dr Ganguly will receive the winner's certificate and the €2,000 prize at a special ceremony of the Royal Irish Academy later this year. She will also be nominated by the Royal Irish Academy to represent Ireland in the 2022 IUPAC-Solvay International Award for Young Chemists. The Kathleen Lonsdale RIA Chemistry Prize is kindly supported by Henkel.



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### **Chemistry and related Science around the World**

### **Chemistry and Related Technology**

**Environmental Protection: Scientists Supposedly Solve Silver Snafu** 1 March 2022 Environmental Protection: Scientists Supposedly Solve Silver Snafu | Chemical Processing

### **Striving To Settle the Debate Over Liquid Water's Structure** 2 March

<u>Striving To Settle the Debate Over Liquid Water's Structure | Technology Networks</u> doi:<u>10.1103/PhysRevLett.128.086002</u>

## New Nature-Inspired Concepts for Efficiently Turning CO2 Into Clean, Sustainable Fuels

1 March <u>New Nature-Inspired Concepts for Efficiently Turning CO2 Into Clean, Sustainable Fuels (scitechdaily.com)</u>

#### A "Greener" Way To Clean Wastewater Treatment Filters With Reusable Nanoparticle Catalysts

2 March <u>A "Greener" Way To Clean Wastewater Treatment Filters With Reusable Nanoparticle Catalysts (scitechdaily.com)</u>

## Ukraine: what is the dangerous 'vacuum bomb' weapon Russia has been accused of using? (Chemical weapon by any other name)

2 March Ukraine: what is the dangerous 'vacuum bomb' weapon Russia has been accused of using? (theconversation.com)

### How the Kobe earthquake could change the way we fight wildfires

How the Kobe earthquake could change the way we fight wildfires | Euronews

### Marie Maynard Daly was a trailblazing biochemist, but her full story may be lost

2 March Trailblazing biochemist Marie Maynard Daly's full story may be lost | Science News

### Enantioselective Synthesis of Versatile Stereogenic-at-P(V) Building Blocks via Hydrogen-Bond-Donor Catalysis | Catalysis | ChemRxiv | Cambridge Open Engage

3 February

Enantioselective Synthesis of Versatile Stereogenic-at-P(V) Building Blocks via Hydrogen-Bond-Donor Catalysis | Catalysis | ChemRxiv | Cambridge Open Engage

### **Trailblazing biochemist Marie Maynard Daly's full story may be lost | Science News** 2 March

https://www.sciencenews.org/article/marie-maynard-daly-biochemistry-chemistry-history

#### Gene editing gets safer thanks to redesigned Cas9 protein

2 March Gene editing gets safer thanks to redesigned Cas9 protein (phys.org) DOI: 10.1038/s41586-022-04470-1

#### **Environmental Protection: Scientists Supposedly Solve Silver Snafu**

1 March Environmental Protection: Scientists Supposedly Solve Silver Snafu | Chemical Processing

#### Heralding a New Era of RNA Therapeutics

3 March Heralding a New Era of RNA Therapeutics | Technology Networks

## One-step electrodeposition of a polypyrrole/NiO nanocomposite as a supercapacitor electrode | Scientific Reports

4 March <u>One-step electrodeposition of a polypyrrole/NiO nanocomposite as a supercapacitor electrode | Scientific Reports</u> <u>(nature.com)</u> DOI https://doi.org/10.1038/s41598-022-07483-y

## Traditional and sustainable approaches for the construction of C–C bonds by harnessing C–H arylation | Nature Communications

28 February https://www.nature.com/articles/s41467-022-28707-9 DOI https://doi.org/10.1038/s41467-022-28707-9

#### A new way to control atomic interactions

28 February https://phys.org/news/2022-02-atomic-interactions.html DOI: 10.1038/s41586-021-04156-0

#### Atom by atom: Building precise smaller nanoparticles with templates

4 March Atom by atom: Building precise smaller nanoparticles with templates (phys.org) DOI: 10.1002/anie.202114353

### **The Significance of Female-Derived Cell Models in Biomedical Research**

The Significance of Female-Derived Cell Models in Biomedical Research (synthego.com)

### **'I thought I had forgotten this horror': Ukrainian scientists stand in defiance** 2 March

<u>'I thought I had forgotten this horror': Ukrainian scientists stand in defiance (nature.com)</u> doi: https://doi.org/10.1038/d41586-022-00621-6

#### The State of Phage Therapy

3 March The State of Phage Therapy (pharmtech.com)

## Engineered assembly of water-dispersible nanocatalysts enables low-cost and green CO2 capture | Nature Communications

10 March https://www.nature.com/articles/s41467-022-28869-6 DOI https://doi.org/10.1038/s41467-022-28869-6

#### Mildred Dresselhaus: a giant of nanoscience - Physics World

8 March Mildred Dresselhaus: a giant of nanoscience – Physics World

## No Thanksgiving for bacteria or fungus - Tryptophan blockers offer new way to kill bad guys

10 March

No Thanksgiving for bacteria or fungus | News (ucr.edu) and

Imaging active site chemistry and protonation states: NMR crystallography of the tryptophan synthase  $\alpha$ -aminoacrylate intermediate

7 January <u>Imaging active site chemistry and protonation states: NMR crystallography of the tryptophan synthase α-aminoacrylate intermediate | PNAS</u> Doi <u>https://doi.org/10.1073/pnas.2109235119</u>

#### **Comet 67P emits ancient molecular oxygen from its nucleus** 10 March Comet 67P emits ancient molecular oxygen from its nucleus | Cornell Chronicle

#### The Future of Scientific Conferences | Technology Networks

7 March The Future of Scientific Conferences | Technology Networks

## Zero Wasted Electricity: Working To Revolutionize the Way We Live With Superconductivity

11 March

Zero Wasted Electricity: Working To Revolutionize the Way We Live With Superconductivity (scitechdaily.com) DOI: 10.1007/s10948-021-06117-0

## Enhanced photoelectrocatalytic degradation of diclofenac sodium using a system of Ag-BiVO4/BiOI anode and Ag-BiOI cathode | Scientific Reports

10 March Enhanced photoelectrocatalytic degradation of diclofenac sodium using a system of Ag-BiVO4/BiOI anode and Ag-BiOI cathode | Scientific Reports (nature.com) DOI https://doi.org/10.1038/s41598-022-08213-0

### Even More Complex Organic Molecules Have Been Found in a Protoplanetary Disc. Was Life Inevitable? - Universe Today

10 March

<u>Even More Complex Organic Molecules Have Been Found in a Protoplanetary Disc. Was Life Inevitable? -</u> <u>Universe Today</u>

### **New catalyst opens possibilities for carbon dioxide in fuel** | **The Stanford Daily** 10 March https://stanforddaily.com/2022/03/10/new-catalyst-opens-possibilities-for-carbon-dioxide-in-fuel

## Discovery of a new catalyst for highly active and selective carbon dioxide hydrogenation to methanol

1 March https://phys.org/news/2022-03-discovery-catalyst-highly-carbon-dioxide.html DOI: 10.1016/S1872-2067(21)63907-4

#### Chemists suggest using polymeric ionic liquids in supercapacitors

11 March <u>Chemists suggest using polymeric ionic liquids in supercapacitors (phys.org)</u> DOI: 10.1039/D1CP04221A

# Combinatorial synthesis of heteroepitaxial, multi-cation, thin-films via pulsed laser deposition coupled with in-situ, chemical and structural characterization | Scientific Reports

7 March https://www.nature.com/articles/s41598-022-06955-5

#### Want to promote diversity in science? Offer better support.

9 March https://www.nature.com/articles/d41586-022-00694-3 doi: https://doi.org/10.1038/d41586-022-00694-3

## After More Than 20 Years, Scientists Have Finally Solved the Full-Length Structure of a Janus Kinase

13 March After More Than 20 Years, Scientists Have Finally Solved the Full-Length Structure of a Janus Kinase (scitechdaily.com) DOI: 10.1126/science.abn8933

## **Building-Block Solar Cells: Computer Algorithm Searches for New Materials for Better Organic Solar Cells**

13 March

Building-Block Solar Cells: Computer Algorithm Searches for New Materials for Better Organic Solar Cells (scitechdaily.com) and

#### **Chemical Design Rules for Non-Fullerene Acceptors in Organic Solar Cells** 8 October 2021

<u>Chemical Design Rules for Non-Fullerene Acceptors in Organic Solar Cells - Markina - 2021 - Advanced Energy</u> <u>Materials - Wiley Online Library</u> DOI: 10.1002/aenm.202102363

## Ukraine war: grim spectre of chemical and biological weapons raises fears of Putin's dirty arsenal

11 March

#### Physicists Startled To Discover a New Way To Shape a Material's Atomic Structure With Light

12 March

https://scitechdaily.com/physicists-startled-to-discover-a-new-way-to-shape-a-materials-atomic-structure-with-light DOI: 10.1103/PhysRevX.12.011029

## **Onyx Boox now endorsing Connected Papers, the advanced visualization tool for academic research - Good e-Reader**

9 March

https://goodereader.com/blog/e-paper/onyx-boox-now-endorsing-connected-papers-the-advanced-visualizationtool-for-academic-research

#### Ukrainian researchers pressure journals to boycott Russian authors

14 March <u>Ukrainian researchers pressure journals to boycott Russian authors (nature.com)</u> doi: https://doi.org/10.1038/d41586-022-00718-y

#### Open science, done wrong, will compound inequities

14 March <u>Open science, done wrong, will compound inequities (nature.com)</u> doi: https://doi.org/10.1038/d41586-022-00724-0

#### Chemical reaction design goes virtual

14 March <u>Chemical reaction design goes virtual | Hokkaido University (hokudai.ac.jp)</u> **Great Oxygenation Event: MIT Scientists' New Hypothesis for One of the Grand Mysteries of Science** 14 March Great Oxygenation Event: MIT Scientists' New Hypothesis for One of the Grand Mysteries of Science

Great Oxygenation Event: MIT Scientists' New Hypothesis for One of the Grand Mysteries of Science (scitechdaily.com) DOI: 10.1038/s41467-022-28996-0

## In situ photodeposition of platinum clusters on a covalent organic framework for photocatalytic hydrogen production | Nature Communications

15 March https://www.nature.com/articles/s41467-022-29076-z DOI https://doi.org/10.1038/s41467-022-29076-z

#### Royal Society of Chemistry report says racism 'pervasive' - BBC News

16 March Royal Society of Chemistry report says racism 'pervasive' - BBC News

#### **Poly(ethylene oxide)-Based Electrolytes for Solid-State Potassium Metal Batteries with a Prussian Blue Positive Electrode | ACS Applied Polymer Materials** 14 March

https://pubs.acs.org/doi/10.1021/acsapm.2c00014 https://doi.org/10.1021/acsapm.2c00014

## Nanostructure Combines Copper, Gold and Silver To Give Carbon Capture and Utilization a Boost

16 March Nanostructure Combines Copper, Gold and Silver To Give Carbon Capture and Utilization a Boost (scitechdaily.com) DOI: 10.1007/s12274-022-4234-5

## To Keep Students in STEM fields, Let's Weed Out the Weed-Out Math Classes - Scientific American

15 March To Keep Students in STEM fields, Let's Weed Out the Weed-Out Math Classes - Scientific American

## New explanation emerges for robust superconductivity in three-layer graphene – Physics World

15 March https://physicsworld.com/a/new-explanation-emerges-for-robust-superconductivity-in-three-layer-graphene

#### **Tool Takes Aim At "Forever Chemicals"**

16 March Tool Takes Aim At "Forever Chemicals" | Chemical Processing

#### New paradigm in atmospheric gas sensing and molecular identification

17 March New paradigm in atmospheric gas sensing and molecular identification (phys.org) DOI: 10.1021/acsami.1c19138

## In situ infrared nanospectroscopy of the local processes at the Li/polymer electrolyte interface | Nature Communications

17 March https://www.nature.com/articles/s41467-022-29103-z DOI https://doi.org/10.1038/s41467-022-29103-z

#### A versatile hydrogel network-repairing strategy

15 March https://phys.org/news/2022-03-versatile-hydrogel-network-repairing-strategy.html DOI: 10.1126/sciadv.abl5066 DOI: 10.1038/nature11409

#### **Printed Electrodes and Sensors Possible With Graphene Ink**

16 March <a href="https://spectrum.ieee.org/printed-electronics-graphene-emulsion">https://spectrum.ieee.org/printed-electronics-graphene-emulsion</a>

## Non-oxidized bare copper nanoparticles with surface excess electrons in air | Nature Nanotechnology

10 February <u>https://www.nature.com/articles/s41565-021-01070-</u> <u>4?utm\_source=nnano\_etoc&utm\_medium=email&utm\_campaign=toc\_41565\_17\_3&utm\_content=20220318</u> DOI https://doi.org/10.1038/s41565-021-01070-4

#### How to grow cement | Nature Biotechnology

16 March <u>https://www.nature.com/articles/s41587-022-01264-</u> <u>8?utm\_source=nbt\_etoc&utm\_medium=email&utm\_campaign=toc\_41587\_40\_3&utm\_content=20220318</u>

#### New technique to view polyethylene creation

16 March https://phys.org/news/2022-03-technique-view-polyethylene-creation.html DOI: 10.1126/science.abi4407 DOI: 10.1126/science.abo2194

#### Researchers discover new form of ice

18 March https://phys.org/news/2022-03-ice.html DOI: 10.1103/PhysRevB.105.104109

### **Cationic-palladium catalyzed regio- and stereoselective syn-1,2dicarbofunctionalization of unsymmetrical internal alkynes** | **Nature Communications** 16 March

https://www.nature.com/articles/s41467-022-28949-7 DOI https://doi.org/10.1038/s41467-022-28949-7

#### Zentropy: New Theory of Entropy May Solve Materials Design Issues

19 March Zentropy: New Theory of Entropy May Solve Materials Design Issues (scitechdaily.com) DOI: 10.1007/s11669-022-00942-z

#### Groundbreaking X-Ray Lens Provides Incredible Glimpse Into the Nanoworld

14 March <a href="https://scitechdaily.com/groundbreaking-x-ray-lens-provides-incredible-glimpse-into-the-nanoworld">https://scitechdaily.com/groundbreaking-x-ray-lens-provides-incredible-glimpse-into-the-nanoworld</a>

#### Light elements make a difference in noble metal catalysis

17 March Light elements make a difference in noble metal catalysis (phys.org) DOI: 10.1016/S1872-2067(21)63899-8

## Physicists find direct evidence of strong electron correlation in a 2D material for the first time | MIT News | Massachusetts Institute of Technology

17 March https://news.mit.edu/2022/electron-correlation-2d-graphene-0317

#### Engineering the boundary between 2D and 3D materials

26 February 2021 Engineering the boundary between 2D and 3D materials | MIT News | Massachusetts Institute of Technology

#### Atomic scale insights on the growth of BiFeO3 nanoparticles

19 March Atomic scale insights on the growth of BiFeO3 nanoparticles | Scientific Reports (nature.com)

### **Novel 'Trojan horse' drug delivery system using protein-based microdroplets** 16 March
#### New Enzyme Has Remarkable Capacity To Help Break Down Chemical Building Block of PET Plastic

21 March <u>New Enzyme Has Remarkable Capacity To Help Break Down Chemical Building Block of PET Plastic</u> (scitechdaily.com)

#### Bottom-Up Synthesis of 8-Connected Three-Dimensional Covalent Organic Frameworks for Highly Efficient Ethylene/Ethane Separation | Journal of the American Chemical Society

21 March https://pubs.acs.org/doi/10.1021/jacs.2c01058 https://doi.org/10.1021/jacs.2c01058

### A completely precious metal–free alkaline fuel cell with enhanced performance using a carbon-coated nickel anode | PNAS

21 March https://www.pnas.org/doi/10.1073/pnas.2119883119 https://doi.org/10.1073/pnas.2119883119

### Unique Ingredient – Originally Designed to Embalm Human Bodies – Used To Strengthen Bamboo

23 March DOI: 10.1016/j.compstruct.2021.115123

#### **Oxidation-proof copper could replace gold in chips • The Register**

22 March Oxidation-proof copper could replace gold in chips • The Register

#### Iron Oxide- and Copper Oxide-Decorated Chemically Reduced Graphene Oxide Composite as a Novel Electrode for Hybrid Supercapacitors | Energy & Fuels 22 March

https://pubs.acs.org/doi/10.1021/acs.energyfuels.1c04234 https://doi.org/10.1021/acs.energyfuels.1c04234

### Electrochemical biosensor for interference-free detection of organophosphorus pesticides

21 March https://phys.org/news/2022-03-electrochemical-biosensor-interference-free-organophosphorus-pesticides.html DOI: 10.1016/j.bios.2022.114111

# **Recycled plastic bottles leach more chemicals into drinks, review finds | Plastics | The Guardian**

18 March https://www.theguardian.com/environment/2022/mar/18/recycled-plastic-bottles-leach-more-chemicals-into-drinks-review-finds

#### Molecular Photochemistry: Rapid Spin-Flip in Colloidal Nanocrystals To Generate Molecular Triplets

24 March

Molecular Photochemistry: Rapid Spin-Flip in Colloidal Nanocrystals To Generate Molecular Triplets (scitechdaily.com)

# Leap Forward in Genetic Sequencing Will Lead to Improved Personalized Medicine and Understanding of Evolution

25 March Leap Forward in Genetic Sequencing Will Lead to Improved Personalized Medicine and Understanding of Evolution (scitechdaily.com) DOI: 10.1126/sciadv.abl3522

#### Sweeteners may be linked to increased cancer risk – new research

24 March <u>Sweeteners may be linked to increased cancer risk – new research (theconversation.com)</u> and <u>Controversial New Study Links Artificial Sweeteners to Cancer Yet Again</u> 25 March <u>Controversial New Study Links Artificial Sweeteners to Cancer Yet Again (sciencealert.com)</u>

### The science of sugar: why we're hardwired to love it and what eating too much does to your brain – podcast (Includes link to podcast)

20 January <u>The science of sugar: why we're hardwired to love it and what eating too much does to your brain – podcast</u> (theconversation.com)

#### How dangerous is ammonia?

21 March https://www.dw.com/en/how-dangerous-is-ammonia/a-61202910

#### €1.8m Investment for DCU spin-out Pilot Photonics

24 March https://www.rte.ie/news/business/2022/0324/1288137-pilot-photonics-funding

#### Revealed: the dangerous chemicals in your food wrappers | PFAS | The Guardian

24 March Revealed: the dangerous chemicals in your food wrappers | PFAS | The Guardian

### It's Official, Microplastics Were Found Circulating in Human Blood For The First Time

25 March

It's Official, Microplastics Were Found Circulating in Human Blood For The First Time (sciencealert.com)

#### **Carbon-coated nickel enables fuel cell free of precious metals | Cornell Chronicle**

23 March https://news.cornell.edu/stories/2022/03/carbon-coated-nickel-enables-fuel-cell-free-precious-metals

#### Breaking down plastic into its constituent parts

24 March Breaking down plastic into its constituent parts (phys.org)

#### Interior of Protons Exhibit Maximum Quantum Entanglement – May Share Common Physics With Black Holes

25 March Interior of Protons Exhibit Maximum Quantum Entanglement – May Share Common Physics With Black Holes (scitechdaily.com) DOI: 10.1140/epjc/s10052-022-10056-y

#### Boron clusters as broadband membrane carriers

23 March Boron clusters as broadband membrane carriers | Nature DOI https://doi.org/10.1038/s41586-022-04413-w

#### Lettuce Engineered To Produce Hormone for Astronauts | Technology Networks

24 March Lettuce Engineered To Produce Hormone for Astronauts | Technology Networks

### Non-Hormonal Pill Could Expand Men's Birth Control Options | Technology

Networks 23 March

Non-Hormonal Pill Could Expand Men's Birth Control Options | Technology Networks

#### New Male Birth Control Pill Effectively Prevents Pregnancy – Without Side Effects

25 March New Male Birth Control Pill Effectively Prevents Pregnancy – Without Side Effects (scitechdaily.com)

#### Deep-Sea Microbe Provides Rich Source of Anticancer Molecule | Technology

Networks 22 March Deep-Sea Microbe Provides Rich Source of Anticancer Molecule | Technology Networks doi: 10.1038/s41589-022-00993-w

#### A better way to separate gases | MIT News | Massachusetts Institute of Technology

24 March https://news.mit.edu/2022/membrane-separate-gases-0325

### Scientists build circuit that generates clean, limitless power from graphene 24 March

Scientists build circuit that generates clean, limitless power from graphene (thebrighterside.news) and Physicists Build Circuit That Generates Clean, Limitless Power From Graphene | University of Arkansas (uark.edu)

### How creative chemistry and collaboration synthesized a better drug strategy for Enterin | Fierce Biotech

28 March <u>https://www.fiercebiotech.com/sponsored/how-creative-chemistry-and-collaboration-synthesized-better-drug-strategy-enterin</u>

### Two Zirconium Metal–Organic Cages with S4 and D2d Symmetry: Construction and Detection of Antibiotics | Crystal Growth & Design

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25 March https://pubs.acs.org/doi/10.1021/acs.cgd.2c00243 https://doi.org/10.1021/acs.cgd.2c00243

#### Light derails electrons through graphene

24 March https://phys.org/news/2022-03-derails-electrons-graphene.html DOI: 10.1126/science.abl4266

#### A new class of materials for nanoscale patterning | Penn Today

23 March <u>https://penntoday.upenn.edu/news/new-class-materials-nanoscale-patterning</u>

#### Three-quarters of UK researchers ready to quit academia

25 March Three-quarters of UK researchers ready to quit academia | News | Chemistry World

#### Russian Scientists Grapple with an Uncertain Future | The Scientist Magazine(R)

25 March

Russian Scientists Grapple with an Uncertain Future | The Scientist Magazine® (the-scientist.com)

### Restoration of antibacterial activity of inactive antibiotics via combined treatment with a cyanographene/Ag nanohybrid

25 March Restoration of antibacterial activity of inactive antibiotics via combined treatment with a cyanographene/Ag nanohybrid | Scientific Reports (nature.com) DOI https://doi.org/10.1038/s41598-022-09294-7

#### No More Ice Cream Crystals Thanks to Cellulose

22 March No More Ice Cream Crystals Thanks to Cellulose | Technology Networks

#### How Much of a Health Risk Are Micro- and Nanoplastics in Food?

24 March <u>How Much of a Health Risk Are Micro- and Nanoplastics in Food? | Technology Networks</u> doi: <u>10.1007/s12403-022-00470-8</u>

#### **Urgent Need To Find Less Toxic Alternatives to Flame Retardants and Plasticizers** 29 March

Urgent Need To Find Less Toxic Alternatives to Flame Retardants and Plasticizers | Technology Networks doi:10.1038/s43017-022-00277-w

#### The race to upcycle CO2 into fuels, concrete and more

29 March <u>The race to upcycle CO2 into fuels, concrete and more (nature.com)</u> doi: https://doi.org/10.1038/d41586-022-00807-y

### Study improves the understanding of superconductivity in magic-angle twisted trilayer graphene

29 March <u>https://phys.org/news/2022-03-superconductivity-magic-angle-trilayer-graphene.html</u>

#### DOI: 10.1038/s41567-022-01515-0

### Visualizing the invisible: A new model to aid interpretation of atomic resolution molecular images

28 March

Visualizing the invisible: A new model to aid interpretation of atomic resolution molecular images (phys.org) DOI: 10.1073/pnas.2114432119

### **Researchers develop reactor that refines waste carbon into chemicals while generating hydrogen – GeekWire**

27 March

 $\underline{https://www.geekwire.com/2022/researchers-develop-reactor-that-refines-waste-carbon-into-chemicals-while-generating-hydrogen$ 

### Scientists develop method to recycle plastic bottles into aviation fuel using less energy 4 June 2021

Scientists develop method to recycle plastic bottles into aviation fuel using less energy - GeekWire

# Enhanced photonics devices based on low temperature plasma-deposited dichlorosilane-based ultra-silicon-rich nitride (Si8N) | Scientific Reports <sup>28</sup> March

https://www.nature.com/articles/s41598-022-09227-4 DOI https://doi.org/10.1038/s41598-022-09227-4

### **Tracking real-time atomic movement between crystal grains in metals** 22 March

https://phys.org/news/2022-03-tracking-real-time-atomic-movement-crystal.html DOI: 10.1126/science.abm2612

#### **Powerful New Method for Generating Protein Drugs**

28 March <u>Powerful New Method for Generating Protein Drugs | Technology Networks</u> doi: <u>10.1038/s41586-022-04654-9</u>

#### **Time for Proteomics To Shine**

17 March Time for Proteomics To Shine | Technology Networks

#### Unprecedented videos show RNA switching 'on' and 'off'

28 March https://phys.org/news/2022-03-unprecedented-videos-rna.html DOI: 10.1093/nar/gkac102 DOI: 10.1016/j.molcel.2020.12.017

#### Watch "What Happens During a Quantum Jump?" on YouTube

12 January 2021 https://youtu.be/j5HyMNNSGqQ

### Synthetic Antibiotics Capable of Killing "Superbugs" Could Save Millions of Lives 29 April

Liverpool scientists develop synthetic antibiotics that could save millions of lives - Articles - Faculty of Health and Life Sciences - University of Liverpool

#### A New Paradigm for Mass Spectral Identifications

2 March <u>A New Paradigm for Mass Spectral Identifications (chromatographyonline.com)</u>

#### **Building the Pharma 4.0 foundation**

13 August 2021 Building the Pharma 4.0 foundation (pharmamanufacturing.com)

#### **Stop Explosion Propagation**

30 March 2022 (57) Stop Explosion Propagation - YouTube

#### Theory on Transfer of Light Energy Refuted

31 March <u>Theory on Transfer of Light Energy Refuted | Technology Networks</u> doi:10.1021/acs.joc.1c02682

### Effect of preparation methods of CeO2 on the properties and performance of Ni/CeO2 in CO2 reforming of CH4 | Scientific Reports

29 March https://www.nature.com/articles/s41598-022-09291-w DOI https://doi.org/10.1038/s41598-022-09291-w

### Amine Organocatalysis of Remote, Chemoselective C(sp3)–H Hydroxylation | ACS Catalysis

28 March https://pubs.acs.org/doi/10.1021/acscatal.2c00392 https://doi.org/10.1021/acscatal.2c00392

#### Structure-guided design enables development of a hyperpolarized molecular probe for the detection of aminopeptidase N activity in vivo

30 March https://www.science.org/doi/10.1126/sciadv.abj2667 https://doi.org/10.1126/sciadv.abj2667

#### Society opens up electrochemical research

30 March Society opens up electrochemical research – Physics World

### **On-surface synthesis of triangulene trimers via dehydration reaction | Nature Communications**

31 March <u>On-surface synthesis of triangulene trimers via dehydration reaction | Nature Communications</u> DOI https://doi.org/10.1038/s41467-022-29371-9

### Dichotomy of platinum(II) and gold(III) carbene intermediates switching from N- to O-selectivity | Nature Communications

#### Turning off the plastic tap | Opinion | Chemistry World

30 March <a href="https://www.chemistryworld.com/opinion/turning-off-the-plastic-tap/4015455.article">https://www.chemistryworld.com/opinion/turning-off-the-plastic-tap/4015455.article</a>

### Aberdeen scientists to study converting CO2 to hydrocarbons through plasma electrocatalysis

31 March <a href="https://worldoil.com/news/2022/3/31/aberdeen-scientists-to-study-converting-co2-to-hydrocarbons-through-plasma-electrocatalysis">https://worldoil.com/news/2022/3/31/aberdeen-scientists-to-study-converting-co2-to-hydrocarbons-through-plasma-electrocatalysis</a>

#### New and Improved Cherry Flavor Thanks to the Petunia Flower

30 March <u>New and Improved Cherry Flavor Thanks to the Petunia Flower (scitechdaily.com)</u> DOI: 10.1038/s41467-022-28978-2

#### Plasmonic catalyst smashes record for reducing vital chemical feedstock | Research | Chemistry World

31 March https://www.chemistryworld.com/news/plasmonic-catalyst-smashes-record-for-reducing-vital-chemicalfeedstock/4015458.article DOI: <u>10.1038/s41565-022-01087-3</u>

#### 2021 Top 25 Chemistry and Materials Sciences Articles

29 March 2021 Top 25 Chemistry and Materials Sciences Articles (nature.com)

#### **Plastics removal**

26 March https://phys.org/news/2022-03-chemists-cook-microplastics-okra.html

#### Researchers create a sea of nano-sized gold stars

30 March https://phys.org/news/2022-03-sea-nano-sized-gold-stars.html DOI: 10.1002/anie.202201980

### Detection of volatile organic compounds using mid-infrared silicon nitride waveguide sensors | Scientific Reports

2 April https://www.nature.com/articles/s41598-022-09597-9 DOI https://doi.org/10.1038/s41598-022-09597-9

# Trinity College to scale back €1bn tech-friendly innovation campus due to lack of government backing - Independent.ie

31 March

 $\label{eq:https://www.independent.ie/business/technology/trinity-college-to-scale-back-1bn-tech-friendly-innovation-campus-due-to-lack-of-government-backing-41508338.html$ 

#### **Powerful New Method for Generating Protein Drugs | Technology Networks** 28 March <u>Powerful New Method for Generating Protein Drugs | Technology Networks</u> doi: 10.1038/s41586-022-04654-9

# Synthetic Antibiotics Capable of Killing "Superbugs" Could Save Millions of Lives | Technology Networks

30 March <u>Synthetic Antibiotics Capable of Killing "Superbugs" Could Save Millions of Lives | Technology Networks</u> **Ultrathin film delivers photoelectrons at high quantum efficiency 30 Mar 2022** 30 March

Ultrathin film delivers photoelectrons at high quantum efficiency - Physics World

### **'Impossible' chemistry may reveal origins of life on Earth** 4 April

'Impossible' chemistry may reveal origins of life on Earth (nationalgeographic.com)

# Atomic coordination dictates vibrational characteristics and thermal conductivity in amorphous carbon | npj Computational Materials

4 April https://www.nature.com/articles/s41524-022-00741-7 DOI https://doi.org/10.1038/s41524-022-00741-7

### A million times faster: DNA nanotechnology could speed up pharmaceutical development while minimizing costs

4 April https://phys.org/news/2022-04-million-faster-dna-nanotechnology-pharmaceutical.html DOI: 10.1038/s41557-022-00912-5

#### Co-creating for a greener tomorrow

4 April Catalysing change in sustainable chemical synthesis | Sponsored | Chemistry World

# Stereoselective intermolecular radical cascade reactions of tryptophans or v-alkenyl- $\alpha$ -amino acids with acrylamides via photoredox catalysis | Nature Communications

1 April https://www.nature.com/articles/s41467-022-29464-5 DOI https://doi.org/10.1038/s41467-022-29464-5

#### Photonic materials: from fundamentals to applications | SpringerLink

1 April https://link.springer.com/article/10.1140/epjs/s11734-022-00541-6 DOI https://doi.org/10.1140/epjs/s11734-022-00541-6

#### **Ultra-Fast Synthesis of Single-Crystalline Three-Dimensional Covalent Organic Frameworks and Their Applications in Polarized Optics | Chemistry of Materials** 3 April 2022

https://pubs.acs.org/doi/10.1021/acs.chemmater.1c02382 https://doi.org/10.1021/acs.chemmater.1c02382

### Enantioselective functionalization at the C4 position of pyridinium salts through NHC catalysis | Nature Communications

1 April https://www.nature.com/articles/s41467-022-29462-7 DOI https://doi.org/10.1038/s41467-022-29462-7

#### SeXX and Immunity event raises crucial questions for society | MIT News | Massachusetts Institute of Technology

4 April 2022 https://news.mit.edu/2022/sexx-and-immunity-event-raises-questions-for-society-0404

### Climeworks Raises \$650 Million in Largest Round for Carbon Capture Technology – Bloomberg

5 April <u>Climeworks Raises \$650 Million in Largest Round for Carbon Capture Technology - Bloomberg</u>

#### **Breaking Through Barriers to Continuous Manufacturing**

3 April Breaking Through Barriers to Continuous Manufacturing (pharmtech.com)

#### Magnetic UiO-66 functionalized with 4,4′ -diamino-2,2′ -stilbenedisulfonic as a highly recoverable acid catalyst for the synthesis of 4H-chromenes in green solvent | Scientific Reports

1 April https://www.nature.com/articles/s41598-022-09337-z DOI https://doi.org/10.1038/s41598-022-09337-z and just to clarify: UiO-66 structure: <u>UiO-66 - novoMOF</u> and UiO-67 Structure: <u>UiO-67 - novoMOF</u>

# Photo-induced trifunctionalization of bromostyrenes via remote radical migration reactions of tetracoordinate boron species | Nature Communications

4 April https://www.nature.com/articles/s41467-022-29466-3 DOI https://doi.org/10.1038/s41467-022-29466-3

#### Hydrogen Abstraction by Alkoxyl Radicals: Computational Studies of Thermodynamic and Polarity Effects on Reactivities and Selectivities | Journal of the American Chemical Society

5 April https://pubs.acs.org/doi/10.1021/jacs.2c00389 https://doi.org/10.1021/jacs.2c00389

#### Proposal to ban 'forever chemicals' in firefighting foams throughout the EU 23 February All news - ECHA (europa.eu)

Lab turns hard-to-process plastic waste into carbon-capture master 5 April

Lab turns hard-to-process plastic waste into carbon-capture master (phys.org) DOI: 10.1021/acsnano.2c00955

#### **Microplastics Found in Human Bloodstream for First Time**

25 March <u>Microplastics Found in Human Bloodstream for First Time | Technology Networks</u> doi:10.1016/j.envint.2022.107199

### Harmful PFAS Chemicals Found in Food Wrappers at Major Fast-Food Restaurants and Grocery Stores

28 March Harmful PFAS Chemicals Found in Food Wrappers at Major Fast-Food Restaurants and Grocery Stores | Technology Networks

### **Will Russia use chemical weapons in Ukraine? Researchers evaluate the risks** 5 April

Will Russia use chemical weapons in Ukraine? Researchers evaluate the risks (nature.com) doi: https://doi.org/10.1038/d41586-022-00948-0

### **Superionic states formation in group III oxides irradiated with ultrafast lasers** 5 August

Superionic states formation in group III oxides irradiated with ultrafast lasers | Scientific Reports (nature.com) DOI https://doi.org/10.1038/s41598-022-09681-0

# Doubly linked chiral phenanthrene oligomers for homogeneously $\pi$ -extended helicenes with large effective conjugation length | Nature Communications 4 April

https://www.nature.com/articles/s41467-022-29108-8 DOI https://doi.org/10.1038/s41467-022-29108-8

#### The Chemical Origins of Life: What Is Life? And Will We Find It on Other Planets?

16 June 2021 <a href="https://scitechdaily.com/the-chemical-origins-of-life-what-is-life-and-will-we-find-it-on-other-planets/amp">https://scitechdaily.com/the-chemical-origins-of-life-what-is-life-and-will-we-find-it-on-other-planets/amp</a>

#### **Reconstructed covalent organic frameworks | Nature**

6 April https://www.nature.com/articles/s41586-022-04443-4 DOI https://doi.org/10.1038/s41586-022-04443-4

### Atomic-scale visualization of chiral charge density wave superlattices and their reversible switching | Nature Communications

5 April https://www.nature.com/articles/s41467-022-29548-2 DOI https://doi.org/10.1038/s41467-022-29548-2

### New studies demonstrate advancements in nanotechnology and their impact across multiple areas of human health

7 April

New studies demonstrate advancements in nanotechnology and their impact across multiple areas of human health (phys.org)

Primordial Helium, Left Over From the Big Bang, is Leaking Out of the Earth

IRISH CHEMICAL NEWS ISSUE NO.2 MAY/ JUNE 2022

#### Microplastics found in lung tissue from live human beings for the first time

8 April https://phys.org/news/2022-04-microplastics-lung-tissue-human.html

### Producing ammonia through electrochemical processes could reduce carbon dioxide emissions

8 April

Producing ammonia through electrochemical processes could reduce carbon dioxide emissions (phys.org) DOI: 10.1038/s41598-021-04640-7

#### MIT Researchers Propose a New Way To Create Synthesizable Molecules

7 April https://scitechdaily.com/mit-researchers-propose-a-new-way-to-create-synthesizable-molecules

# Freestanding non-covalent thin films of the propeller-shaped polycyclic aromatic hydrocarbon decacyclene | Nature Communications

8 April https://www.nature.com/articles/s41467-022-29429-8 DOI https://doi.org/10.1038/s41467-022-29429-8

#### One on one with Alison Wendlandt

8 April https://cen.acs.org/synthesis/catalysis/One-on-one-with-Alison-Wendlandt/100/i12

#### A new technique to detect collisions between single atom-ion pairs

8 April https://phys.org/news/2022-04-technique-collisions-atom-ion-pairs.html

### Experimental modelling studies on the removal of dyes and heavy metal ions using ZnFe2O4 nanoparticles | Scientific Reports

9 April https://www.nature.com/articles/s41598-022-10036-y DOI https://doi.org/10.1038/s41598-022-10036-y

### Tiny labmade motors could one day suck pollutants from the air and harvest precious metals | Science | AAAS

6 April <u>https://www.science.org/content/article/tiny-labmade-motors-could-one-day-suck-pollutants-air-and-harvest-precious-metals</u> doi: 10.1126/science.abq4138

### Encapsulation within a coordination cage modulates the reactivity of redox-active dyes

30 March Encapsulation within a coordination cage modulates the reactivity of redox-active dyes | Communications Chemistry (nature.com) DO Ihttps://doi.org/10.1038/s42004-022-00658-8

### Size-control in the synthesis of oxo-bridged phosphazane macrocycles via a modular addition approach

22 February 2021 Size-control in the synthesis of oxo-bridged phosphazane macrocycles via a modular addition approach | Communications Chemistry (nature.com) DOI https://doi.org/10.1038/s42004-021-00455-9

#### Celebrating Women in Chemistry & More

8 March Celebrating Women in Chemistry (nature.com)

#### Amid the Terror of War, Efforts to Keep Science Alive in Ukraine

28 March Amid the Terror of War, Efforts to Keep Science Alive in Ukraine | The Scientist Magazine® (the-scientist.com)

#### Down the sustainability road

Pharma's road towards a greener future may deliver widespread growth 8 April Down the sustainability road (pharmamanufacturing.com)

### **Time Crystals: "Back to Basics" Approach Helps Unravel New Phase of Matter** 2 October 2021

Time Crystals: "Back to Basics" Approach Helps Unravel New Phase of Matter (scitechdaily.com) DOI: 10.1103/PhysRevB.104.094308

#### What Is a Time Crystal?

What Is a Time Crystal? (sciencealert.com)

#### Time Crystals: A New Form Of Matter That Could Change Everything!

9 November 2018 Time Crystals: A New Form Of Matter That Could Change Everything (resonancescience.org)

#### Time Crystals: new states of matter, by Frank Wilczek (Video)

28 May 2017 <u>Time Crystals: new states of matter, by Frank Wilczek - Bing video</u>

#### Time Crystals! (Short video)

15 March 2017 <u>Time Crystals! - Bing video</u> https://www.bing.com/videos/search?q=what+is+a+time+crystal+state+of+matter&qpvt=what+is+a+time+crystal+ state+of+matter&view=detail&mid=EC6FF7CCFB53E3B894D6EC6FF7CCFB53E3B894D6&&FORM=VRDGA R&ru=%2Fvideos%2Fsearch%3Fq%3Dwhat%2Bis%2Ba%2Btime%2Bcrystal%2Bstate%2Bof%2Bmatter%26qpvt %3Dwhat%2Bis%2Ba%2Btime%2Bcrystal%2Bstate%2Bof%2Bmatter%26FORM%3DVDRE

# It's Official: Time Crystals Are a New State of Matter, And Now We Can Create Them

9 March 2017 It's Official: Time Crystals Are a New State of Matter, And Now We Can Create Them (sciencealert.com)

#### Organic semiconductor-based nanoparticles with long-lasting reactive charges

IRISH CHEMICAL NEWS ISSUE NO.2 MAY/ JUNE 2022

11 April https://techxplore.com/news/2022-04-semiconductor-based-nanoparticles-long-lasting-reactive.html DOI: 10.1038/s41560-022-00990-2 DOI: 10.1038/s41563-019-0591-1

#### Amorphous-to-Crystalline Transformation: General Synthesis of Hollow Structured Covalent Organic Frameworks with High Crystallinity | Journal of the American Chemical Society

5 April https://pubs.acs.org/doi/10.1021/jacs.2c02089 https://doi.org/10.1021/jacs.2c02089

#### Using electrochemistry techniques to design catalysts for sustainable fuels 6 April

Using electrochemistry techniques to design catalysts for sustainable fuels (phys.org) DOI: 10.1038/s41929-021-00666-2

#### Molecular factories: The combination between nature and chemistry is functional 9 January 2020

Molecular factories: The combination between nature and chemistry is functional (phys.org) DOI: 10.1002/advs.201901923

### Clocking the Movement of Electrons Inside an Atom – Down to a Millionth of a Billionth of a Second

13 February 2021 https://scitechdaily.com/clocking-the-movement-of-electrons-inside-an-atom-down-to-a-millionth-of-a-billionth-ofa-second DOI: 10.1038/s41567-020-01111-0

#### Developing organic nitrogen fertiliser to enhance agriculture production

12 April Developing organic nitrogen fertiliser to enhance agriculture production (innovationnewsnetwork.com)

#### Establishing methods for ethical and sustainable lithium production

April? (Contains link to an ebook) Establishing methods for ethical and sustainable lithium production (innovationnewsnetwork.com)

### Some "Biodegradable" Plastics Perform No Better Than Traditional Plastics in the Ocean

13 April

Some "Biodegradable" Plastics Perform No Better Than Traditional Plastics in the Ocean | Technology Networks doi: 10.1016/j.marenvres.2022.105607

#### New Method Allows Scientists To Synthesize Crystals in Ways Not Found in Nature

13 April New Method Allows Scientists To Synthesize Crystals in Ways Not Found in Nature (scitechdaily.com) DOI: 10.1038/s41563-021-01170-5

#### Atomic-Resolution Imaging of Small Organic Molecules on Graphene | Nano Letters 12 April

https://pubs.acs.org/doi/10.1021/acs.nanolett.2c00213

#### Boosting the Ion Mobility in Solid Polymer Electrolytes Using Hollow Polymer Nanospheres as an Additive | ACS Applied Materials & Interfaces

12 April https://pubs.acs.org/doi/10.1021/acsami.2c00244 https://doi.org/10.1021/acsami.2c00244

#### Chemical reactions for the energy transition – MIT Department of Chemistry

4 April https://chemistry.mit.edu/chemistry-news/chemical-reactions-for-the-energy-transition

#### High Entropy Alloy Electrocatalytic Electrode toward Alkaline Glycerol Valorization Coupling with Acidic Hydrogen Production | Journal of the American Chemical Society

11 April https://pubs.acs.org/doi/10.1021/jacs.1c13740 https://doi.org/10.1021/jacs.1c13740

#### Atomic Level Look at Catalytic Converters Suggests Roots for Improvement 8 April

Atomic Level Look at Catalytic Converters Suggests Roots for Improvement | Technology Networks doi: <u>10.1021/acs.chemmater.1c03513</u>

#### **Ammonia Production Method Could Cut CO2 Emissions**

11 April <u>Ammonia Production Method Could Cut CO2 Emissions | Technology Networks</u> doi: <u>10.1038/s41598-021-04640-7</u>

#### Indian Team Solve Key Puzzle Of Universe: How Elements Became Heavier Than Iron

4 January 2022 Indian Team Solve Key Puzzle Of Universe: How Elements Became Heavier Than Iron (indiatimes.com)

#### A compact polymer–inorganic hybrid gas barrier nanolayer for flexible organic lightemitting diode displays | npj Flexible Electronics

13 April https://www.nature.com/articles/s41528-022-00154-y DOI https://doi.org/10.1038/s41528-022-00154-y

#### Predicting the most stable boron nitride structure with quantum simulations

14 April <u>Predicting the most stable boron nitride structure with quantum simulations (phys.org)</u> <u>DOI: 10.1021/acs.jpcc.1c10943</u>

#### Researchers find declining nitrogen availability in a nitrogen rich world

14 April https://phys.org/news/2022-04-declining-nitrogen-availability-rich-world.html DOI: 10.1126/science.abh3767. www.science.org/doi/10.1126/science.abh3767

#### **Enhanced Energy Storage Capacity of Graphene Supercapacitors via Solar Heating** 15 April Enhanced Energy Storage Capacity of Graphene Supercapacitors via Solar Heating (scitechdaily com)

Enhanced Energy Storage Capacity of Graphene Supercapacitors via Solar Heating (scitechdaily.com) DOI: 10.1039/D1TA09222G

# A Better Way To Separate Gases: New Kind of Membrane Works With 1/10 the Energy and Emissions

14 April A Better Way To Separate Gases: New Kind of Membrane Works With 1/10 the Energy and Emissions (scitechdaily.com) DOI: 10.1126/science.abl7163

#### **Electrifying Chemistry | Magazine**

16 June 2021 https://magazine.engineering.columbia.edu/spring-2021/electrifying-chemistry

#### DNA Origami-Templated Bimetallic Core–Shell Nanostructures for Enhanced Oxygen Evolution Reaction | The Journal of Physical Chemistry C

15 April https://pubs.acs.org/doi/10.1021/acs.jpcc.2c00007 https://doi.org/10.1021/acs.jpcc.2c00007

#### In situ dual doping for constructing efficient CO2-to-methanol electrocatalysts | Nature Communications

12 April https://www.nature.com/articles/s41467-022-29698-3 DOI https://doi.org/10.1038/s41467-022-29698-3

### **Developing Novel Electrochemical Reactions to Decarbonize Our Energy Systems** 23 October 20202

https://scitechdaily.com/developing-novel-electrochemical-reactions-to-decarbonize-our-energy-systems

#### Enantioselective Au(I)/Au(III) Redox Catalysis Enabled by Chiral (P,N)-Ligands | Journal of the American Chemical Society

18 April https://pubs.acs.org/doi/10.1021/jacs.2c02799 https://doi.org/10.1021/jacs.2c02799

# On the pseudo-hyperbolic behavior of charge transfer resistance–temperature dependence in corrosion behavior of Nickel based glass alloy | Scientific Reports 19 April

https://www.nature.com/articles/s41598-022-10462-y DOI https://doi.org/10.1038/s41598-022-10462-y

**Quantum simulations enable prediction of stable boron nitride structure** 14 April Quantum simulations enable prediction of stable boron nitride structure (innovationnewsnetwork.com)

# Predicting the lattice thermal conductivity of alloyed compounds from the perspective of configurational entropy | npj Computational Materials

21 April

Predicting the lattice thermal conductivity of alloyed compounds from the perspective of configurational entropy | npj Computational Materials (nature.com) DOI https://doi.org/10.1038/s41524-022-00771-1

#### NIST Study Shows Everyday Plastic Products Release Trillions of Microscopic Particles Into Water | NIST

20 April

NIST Study Shows Everyday Plastic Products Release Trillions of Microscopic Particles Into Water | NIST DOI: 10.1021/acs.est.1c06768

### **Energy crisis lifeline as Oxford experts find sapphire could help 'improve efficiency'** 21 April

Energy crisis lifeline as Oxford experts find sapphire could help 'improve efficiency' | Science | News | Express.co.uk

#### A Foresight into the European Chemical Industry of 2050

8 January 2021 https://blog.agchemigroup.eu/a-foresight-into-the-european-chemical-industry-of-2050

#### The Global Chemical Industry: Does it Really Have to be Such a Struggle?

30 April 2020 <u>https://www.frost.com/frost-perspectives/the-global-chemical-industry-does-it-really-have-to-be-such-a-struggle</u>

#### Extremely sensitive nano-sensors can detect trace amounts of molecules

19 April https://phys.org/news/2022-04-extremely-sensitive-nano-sensors-amounts-molecules.html DOI: 10.1002/adfm.202200148

#### Instant Long Duration Energy Storage: Just Add Carbon Dioxide

22 April <u>https://cleantechnica.com/2022/04/22/instant-long-duration-energy-storage-just-add-carbon-dioxide</u>

# Bridging microscopy with molecular dynamics and quantum simulations: an atomAI based pipeline | npj Computational Materials

20 April https://www.nature.com/articles/s41524-022-00733-7 DOI https://doi.org/10.1038/s41524-022-00733-7

### Hydrogen Molecule Turned Into a Quantum Sensor – With Unprecedented Time and Spatial Resolutions

23 April https://scitechdaily.com/hydrogen-molecule-turned-into-a-quantum-sensor-with-unprecedented-time-and-spatialresolutions DOI: 10.1126/science.abn9220

### Steering the structure and selectivity of CO2 electroreduction catalysts by potential pulses | Nature Catalysis

21 April https://www.nature.com/articles/s41929-022-00760-z DOI https://doi.org/10.1038/s41929-022-00760-z

#### Open questions on emergence in chemistry

7 April <u>Open questions on emergence in chemistry | Communications Chemistry (nature.com)</u> DOI https://doi.org/10.1038/s42004-022-00667-7

### Steering the structure and selectivity of CO2 electroreduction catalysts by potential pulses | Nature Catalysis

21 April https://www.nature.com/articles/s41929-022-00760-z DOI https://doi.org/10.1038/s41929-022-00760-z

#### Nano state: tiny and now everywhere, how big a problem are nanoparticles? | Pollution | The Guardian

25 April <u>https://www.theguardian.com/environment/2022/apr/25/nano-state-tiny-and-now-everywhere-how-big-a-problem-are-nanoparticles</u>

# Enhanced interfacial interaction between modified cellulose nanocrystals and epoxidized natural rubber via ultraviolet irradiation | Scientific Reports

23 April https://www.nature.com/articles/s41598-022-10558-5 DOI https://doi.org/10.1038/s41598-022-10558-5

#### Adapting your operating model to the next normal: The next big move in chemicals

24 February 2021 Adapting the chemicals operating model to the next normal | McKinsey

#### Chemicals and capital markets: Growing sustainably

22 April Sustainable chemicals in capital markets | McKinsey

#### How to handle a supervisor's sudden departure

25 April <u>How to handle a supervisor's sudden departure (nature.com)</u> doi: https://doi.org/10.1038/d41586-022-01116-0

### Van der Waals integration of high-k perovskite oxides and two-dimensional semiconductors | Nature Electronics

25 April https://www.nature.com/articles/s41928-022-00753-7 DOI https://doi.org/10.1038/s41928-022-00753-7

# Insights into the activity of single-atom Fe-N-C catalysts for oxygen reduction reaction | Nature Communications

19 April https://www.nature.com/articles/s41467-022-29797-1 DOI https://doi.org/10.1038/s41467-022-29797-1

#### Enzyme Has Potential To Reduce Reliance on Non-Renewable Agricultural Fertilizers

13 April

Enzyme Has Potential To Reduce Reliance on Non-Renewable Agricultural Fertilizers | Technology Networks doi:10.1073/pnas.2118122119

#### Learning Chemical Networks Give Life a Chiral Twist – Symmetry Breaking To Optimize Energy Harvesting

26 April Learning Chemical Networks Give Life a Chiral Twist – Symmetry Breaking To Optimize Energy Harvesting (scitechdaily.com) DOI: 10.1038/s41467-022-29952-8

# Synergistic use of siderophores and weak organic ligands during zinc transport in the rhizosphere controlled by pH and ion strength gradients | Scientific Reports

26 April https://www.nature.com/articles/s41598-022-10493-5 DOI https://doi.org/10.1038/s41598-022-10493-5

### Electronic structure study of kagome metals bolsters understanding of correlated phenomena

25 April Electronic structure study of kagome metals bolsters understanding of correlated phenomena (phys.org) DOI: 10.1038/s41467-022-29828-x

#### University or technological university – what's in a name?

26 April University or technological university – what's in a name? (irishtimes.com)

#### The 2021 Nobel Prize in Chemistry - Periodic Table of Videos

9 October 2021 <u>The 2021 Nobel Prize in Chemistry - Periodic Table of Videos - YouTube</u> https://www.youtube.com/watch?v=MYOsCjbNOkI

#### **Microplastics in Seawater May Harbor Parasites**

26 April Microplastics in Seawater May Harbor Parasites | The Scientist Magazine® (the-scientist.com)

#### Catalytic synthesis of phenols with nitrous oxide | Nature

27 April https://www.nature.com/articles/s41586-022-04516-4 DOI https://doi.org/10.1038/s41586-022-04516-4

#### **Improved Silver Coating for Medical Devices Kills Bacteria To Prevent Infection** 27 April

Improved Silver Coating for Medical Devices Kills Bacteria To Prevent Infection (scitechdaily.com) DOI: 10.1021/acscentsci.1c01556

#### Computer-designed repurposing of chemical wastes into drugs | Nature

27 April https://www.nature.com/articles/s41586-022-04503-9 DOI https://doi.org/10.1038/s41586-022-04503-9

#### Chemicals in everyday products are spurring obesity – EHN

25 April <u>https://www.ehn.org/chemicals-in-everyday-products-are-spurring-obesity-warns-a-new-review-2657191067/endocrine-disrupting-chemicals</u>

#### Good Formulas for Chemical Industry Clients by Toby Horne on Ingenuity

1 June 2021 https://ingenuity.siemens.com/2021/06/good-formulas-for-chemical-industry-clients

### New molecule sets stage for nickel as a 'greener' photocatalyst, reveals key steps in reaction process

26 April <u>https://phys.org/news/2022-04-molecule-stage-nickel-greener-photocatalyst.html</u> DOI: 10.1038/s41467-022-28948-8

#### Driving sustainable chemistry forward together

9 March 2021 https://www.basf.com/global/en/who-we-are/sustainability/whats-new/sustainability-news/2021/driving-sustainable-chemistry-forward-together.html

# Unlocking bimetallic active sites via a desalination strategy for photocatalytic reduction of atmospheric carbon dioxide | Nature Communications

20 April https://www.nature.com/articles/s41467-022-29671-0 DOI https://doi.org/10.1038/s41467-022-29671-0

#### Soft matter theorist: Profile Profile of Glenn H. Fredrickson

26 April <u>Profile of Glenn H. Fredrickson | PNAS</u> https://doi.org/10.1073/pnas.2205307119

#### NUI Galway to change its name amid confusion over its proper title

27 April NUI Galway to change its name amid confusion over its proper title (irishtimes.com)

### All of the bases in DNA and RNA have now been found in meteorites 26 April

All of the bases in DNA and RNA have now been found in meteorites | Science News doi: 10.1038/s41467-022-29612-x

### **Chemistry education must change to help the planet: here's how** 27 April

<u>Chemistry education must change to help the planet: here's how (nature.com)</u> doi: https://doi.org/10.1038/d41586-022-01109-z

#### Universality out of order | Nature Communications

Orders, rankings, and hierarchies on one side, universal statistical laws on the other... 29 April

Universality out of order | Nature Communications DOI https://doi.org/10.1038/s41467-022-29955-5

#### Long-awaited accelerator ready to explore origins of elements

#### 29 April https://www.nature.com/articles/d41586-022-00711-5 doi: https://doi.org/10.1038/d41586-022-00711-5

### **Doping of carbon nanotubes by halogenated solvents** | **Scientific Reports** 29 April

Doping of carbon nanotubes by halogenated solvents | Scientific Reports (nature.com) DOI https://doi.org/10.1038/s41598-022-11162-3

#### New Pumpkin-Shaped Atomic Nucleus Radiates Protons at Record-Setting Rate

1 May <u>https://scitechdaily.com/new-pumpkin-shaped-atomic-nucleus-radiates-protons-at-record-setting-rate</u> DOI: 10.1103/PhysRevLett.128.112501

#### Versatile acid solvents for pristine carbon nanotube assembly

27 April https://www.science.org/doi/10.1126/sciadv.abm3285 DOI: 10.1126/sciadv.abm3285

#### Parasites Can Ride Sea-Faring Microplastics, Possibly Contaminating Ocean Life And Us

30 April Parasites Can Ride Sea-Faring Microplastics, Possibly Contaminating Ocean Life And Us (sciencealert.com)

#### **Controlling chemical mirror images**

29 April Controlling chemical mirror images (phys.org) DOI: 10.1103/PhysRevLett.128.173001

### Maximum reduction of energy losses in multicore MgB \$\$\_{2}\$\$ 2 wires by metastructured soft-ferromagnetic coatings | Scientific Reports

29 April https://www.nature.com/articles/s41598-022-10728-5 DOI https://doi.org/10.1038/s41598-022-10728-5

# Controlled synthesis of graphene oxide/silica hybrid nanocomposites for removal of aromatic pollutants in water | Scientific Reports

29 April https://www.nature.com/articles/s41598-022-10602-4 DOI https://doi.org/10.1038/s41598-022-10602-4

#### A clock beats inside the heart of every atom - Big Think

28 April A clock beats inside the heart of every atom - Big Think

#### A Unified Approach to Decarboxylative Halogenation of (Hetero)aryl Carboxylic Acids | Journal of the American Chemical Society

29 April A Unified Approach to Decarboxylative Halogenation of (Hetero)aryl Carboxylic Acids | Journal of the American Chemical Society (acs.org) https://doi.org/10.1021/jacs.2c02392

#### **Versatile acid solvents for pristine carbon nanotube assembly** 27 April Versatile acid solvents for pristine carbon nanotube assembly (science.org)

DOI: 10.1126/sciadv.abm3285

#### Team demonstrates rare form of electricity in ultra-thin material

27 April <u>https://phys.org/news/2022-04-team-rare-electricity-ultra-thin-material.html</u> DOI: 10.1038/s41699-022-00298-5

### An Experiment That Could Confirm the Fifth State of Matter in the Universe – And Change Physics As We Know It

29 April https://scitechdaily.com/an-experiment-that-could-confirm-the-fifth-state-of-matter-in-the-universe-and-changephysics-as-we-know-it DOI: 10.1063/5.0087175

#### An Alternative To Storing Carbon Deep Underground: Nanotubes

30 April

https://www.forbes.com/sites/ianpalmer/2022/04/30/an-alternative-to-storing-carbon-deep-underground-carbon-nanotubes/?sh=6c017e682be8

#### Utilization of the peroxidase-like activity of silver nanoparticles nanozyme on Ophenylenediamine/H2O2 system for fluorescence detection of mercury (II) ions | Scientific Reports

28 April

Utilization of the peroxidase-like activity of silver nanoparticles nanozyme on O-phenylenediamine/H2O2 system for fluorescence detection of mercury (II) ions | Scientific Reports (nature.com) DOI https://doi.org/10.1038/s41598-022-10779-8

#### Carbon-free cement: Breakthrough, DCVC put \$55 million into Brimstone

28 April https://www.cnbc.com/2022/04/28/carbon\_free\_cement\_breakthrough\_c

 $\underline{https://www.cnbc.com/2022/04/28/carbon-free-cement-breakthrough-dcvc-put-55-million-into-brimstone.html}$ 

# 'A worldwide public health threat': Rob Bilott on his 20-year fight against forever chemicals | PFAS | The Guardian

1 May

https://www.theguardian.com/environment/2022/may/01/pfas-forever-chemicals-rob-bilott-lawyer-interview

### Heat flow shown to be more efficient when temperature is oscillating than when static 27 April

https://phys.org/news/2022-04-shown-efficient-temperature-oscillating-static.html DOI: 10.1103/PhysRevLett.128.134502

#### Controlling heat flow in a solid by switching crystal structure dimensionality

25 April https://phys.org/news/2022-04-solid-crystal-dimensionality.html DOI: 10.1002/aelm.202200024

#### 'Red-letter day' as southeast gets its first university

1 May

'Red-letter day' as southeast gets its first university (rte.ie)

#### Intermolecular diastereoselective annulation of azaarenes into fused N-heterocycles by Ru(II) reductive catalysis | Nature Communications 2 May

https://www.nature.com/articles/s41467-022-29985-z DOI https://doi.org/10.1038/s41467-022-29985-z

# Covalent organic frameworks with high quantum efficiency in sacrificial photocatalytic hydrogen evolution | Nature Communications

29 April https://www.nature.com/articles/s41467-022-30035-x DOI https://doi.org/10.1038/s41467-022-30035-x

#### **Using Sound To Control Enzymatic Reactions**

2 May <u>Using Sound To Control Enzymatic Reactions (scitechdaily.com)</u> DOI: 10.1038/s41467-022-30124-x

# Fire-retardant effect of titania-polyurea coating and additional enhancement via aromatic diamine and modified melamine polyphosphate | npj Materials Degradation <sup>2</sup> May

https://www.nature.com/articles/s41529-022-00248-y DOI https://doi.org/10.1038/s41529-022-00248-y

#### UCD spin-out PlasmaBound secures €2.35m for its sustainability tech 3 May UCD spin-out PlasmaBound secures €2.35m for its sustainability tech (siliconrepublic.com)

### **Entropy production could be a key guide to predicting how a reaction product forms** 3 May

Beyond the transition state | Opinion | Chemistry World

### **Cheaper, Faster New Way To Continuously Produce Amines – Chemical Building Blocks Used in Many Products**

4 May Cheaper, Faster New Way To Continuously Produce Amines – Chemical Building Blocks Used in Many Products (scitechdaily.com) DOI: 10.1038/s41467-022-30175-0

# $\label{eq:constraint} \begin{array}{l} \text{Dihydroquinazolinones as adaptative $C(sp3)$ handles in arylations and alkylations via dual catalytic $C-C$ bond-functionalization | Nature Communications \\ \end{array}$

3 May https://www.nature.com/articles/s41467-022-29984-0 DOI https://doi.org/10.1038/s41467-022-29984-0

#### **Metamaterial significantly enhances chiral nanoparticle signals** 3 May

https://phys.org/news/2022-05-metamaterial-significantly-chiral-nanoparticle.html DOI: 10.1021/acsphotonics.1c00882

### **Organocatalytic stereoselective cyanosilylation of small ketones** | **Nature** 4 May

https://www.nature.com/articles/s41586-022-04531-5

DOI https://doi.org/10.1038/s41586-022-04531-5

### **Cheaper, Faster New Way To Continuously Produce Amines – Chemical Building Blocks Used in Many Products**

4 May Cheaper, Faster New Way To Continuously Produce Amines – Chemical Building Blocks Used in Many Products (scitechdaily.com) DOI: 10.1038/s41467-022-30175-0

#### 2021 Top 25 Chemistry and Materials Sciences Articles

29 March 2021 Top 25 Chemistry and Materials Sciences Articles (nature.com)

# The development of Friedländer heteroannulation through a single electron transfer and energy transfer pathway using methylene blue (MB+) $\,$

4 May

The development of Friedländer heteroannulation through a single electron transfer and energy transfer pathway using methylene blue (MB+) | Scientific Reports (nature.com) DOI https://doi.org/10.1038/s41598-022-11349-8

#### Rapid access to polycyclic N-heteroarenes from unactivated, simple azines via a basepromoted Minisci-type annulation | Nature Communications

3 May https://www.nature.com/articles/s41467-022-30086-0 DOI https://doi.org/10.1038/s41467-022-30086-0

### **Supercomputing and neutrons crack code to uranium compound's signature vibes** 5 May

https://phys.org/news/2022-05-supercomputing-neutrons-code-uranium-compound.html DOI: 10.1021/acs.jpcc.1c05747

# Topography inversion in scanning tunneling microscopy of single-atom-thick materials from penetrating substrate states | Scientific Reports

5 May https://www.nature.com/articles/s41598-022-10870-0

### Researchers unravel the active phase in catalytic carbon dioxide reduction to methanol

5 May

Researchers unravel the active phase in catalytic carbon dioxide reduction to methanol (phys.org) DOI: 10.1126/science.abj7747. www.science.org/doi/10.1126/science.abj7747

**'Metalens' could disrupt vacuum UV market** 5 May https://phys.org/news/2022-05-metalens-disrupt-vacuum-uv.html DOI: 10.1126/sciadv.abn5644

#### Catalytic site seeing (subscription)

5 May Catalytic site seeing | Nature Chemistry

#### A new age of 2.5D materials

6 May https://phys.org/news/2022-05-age-25d-materials.html DOI: 10.1080/14686996.2022.2062576

#### High-Speed X-Ray Lasers Reveal the Secret Crystal Structures of Small Molecules

8 May <u>High-Speed X-Ray Lasers Reveal the Secret Crystal Structures of Small Molecules (scitechdaily.com)</u> DOI: 10.1038/s41586-021-04218-3

#### Interdisciplinary toolkit is a blueprint for 'world-class' research

6 May SHAPE-ID: Shaping Interdisciplinary Practices in Europe (shapeid.eu)

#### Scientists synthesize new, ultra-hard material

6 May Scientists synthesize new, ultra-hard material (phys.org) DOI: 10.1016/j.carbon.2021.12.040

#### How three Ukrainian scientists are surviving Russia's brutal war

9 May <u>How three Ukrainian scientists are surviving Russia's brutal war (nature.com)</u> doi: https://doi.org/10.1038/d41586-022-01272-3

#### "Visualizing the Proton" – Physicists' Innovative Animation Depicts the Subatomic World in a New Way

9 May

https://scitechdaily.com/visualizing-the-proton-physicists-innovative-animation-depicts-the-subatomic-world-in-a-new-way

# $Catalytic a symmetric \ Tsuji-Trost \ \alpha-benzylation \ reaction \ of \ N-unprotected \ amino \ acids \ and \ benzyl \ alcohol \ derivatives \ | \ Nature \ Communications$

6 May <u>Catalytic asymmetric Tsuji–Trost α–benzylation reaction of N-unprotected amino acids and benzyl alcohol</u> <u>derivatives | Nature Communications</u> DOI https://doi.org/10.1038/s41467-022-30277-9

Doubly stereoconvergent construction of vicinal all-carbon quaternary and tertiary stereocenters by Cu/Mg-catalyzed propargylic substitution | Nature Communications 4 May

https://www.nature.com/articles/s41467-022-29986-y DOI https://doi.org/10.1038/s41467-022-29986-y

#### **Biopolymers: manufacturing's latest green hero?**

2 May Biopolymers: manufacturing's latest green hero? | CAS

#### Flame-retardant coating stops even wood from catching fire

#### Modern Alchemy Makes "Chameleon Metal" Behave Like Precious Catalysts | IFLScience

11 May Modern Alchemy Makes "Chameleon Metal" Behave Like Precious Catalysts | IFLScience

### Decarboxylative tandem C-N coupling with nitroarenes via SH2 mechanism | Nature Communications

4 May https://www.nature.com/articles/s41467-022-30176-z DOI https://doi.org/10.1038/s41467-022-30176-z

#### Cleopatra's Perfume Has Been Recreated By Scientists – And It's Spicy

9 May Cleopatra's Perfume Has Been Recreated By Scientists – And It's Spicy | IFLScience

### **Stop squandering data: make units of measurement machine-readable** 10 May

Stop squandering data: make units of measurement machine-readable (nature.com) doi: https://doi.org/10.1038/d41586-022-01233-w

### Prof Veronica Campbell designated as South East Technological University's first President

28 April <u>Prof Veronica Campbell designated as South East Technological University's first President | News | Waterford</u> <u>Institute of Technology (wit.ie)</u>

### Non-invasive imaging of atomic arrangement at the sub-angstrom scale in 2-D hybrid perovskites

11 May https://phys.org/news/2022-05-non-invasive-imaging-atomic-sub-angstrom-scale.html DOI: 10.1126/sciadv.abj0395 DOI: 10.1038/s41560-018-0324-8

#### As much pressure as Uranus' core: The first materials synthesis research and study in the terapascal range

11 May

As much pressure as Uranus' core: The first materials synthesis research and study in the terapascal range (phys.org) DOI: 10.1038/s41586-022-04550-2

#### A promising solution to improve the surface hydrophobicity of hydrophobic membranes

11 May

A promising solution to improve the surface hydrophobicity of hydrophobic membranes (phys.org) DOI: 10.1007/s11705-021-2098-y

### Patent-Pending Technology Converts "Waste" Carbon Into Valuable Chemicals and Useful Elements

11 May <u>Patent-Pending Technology Converts "Waste" Carbon Into Valuable Chemicals and Useful Elements</u> (scitechdaily.com) <u>DOI: 10.1016/j.apcatb.2020.119277</u>

#### The Origin of Life on Earth: A Paradigm Shift

13 May <u>The Origin of Life on Earth: A Paradigm Shift (scitechdaily.com)</u> DOI: 10.1038/s41586-022-04676-3

#### Titanium Dioxide (E171) - A practical example of UK divergence from EU law

11 May <u>Titanium Dioxide E171 A practical example of UK divergence from EU law (cms-lawnow.com)</u>

# **One-pot synthesis of Au-M@SiO2 (M = Rh, Pd, Ir, Pt) core-shell nanoparticles as highly efficient catalysts for the reduction of 4-nitrophenol | Scientific Reports** 10 May

One-pot synthesis of Au-M@SiO2 (M = Rh, Pd, Ir, Pt) core-shell nanoparticles as highly efficient catalysts for the reduction of 4-nitrophenol | Scientific Reports (nature.com) DOI https://doi.org/10.1038/s41598-022-11756-x

# Novel fabrication of hydrophobic/oleophilic human hair fiber for efficient oil/water separation through one-pot dip-coating synthesis route | Scientific Reports 10 May

https://www.nature.com/articles/s41598-022-11511-2 DOI https://doi.org/10.1038/s41598-022-11511-2

#### Mid-infrared-scanning cavity ring-down CH2F2 detection using electronically tuned Cr:ZnSe laser | Scientific Reports

12 May https://www.nature.com/articles/s41598-022-12019-5 DOI https://doi.org/10.1038/s41598-022-12019-5

### Thermal and mechanical characterization of nanoporous two-dimensional MoS2 membranes | Scientific Reports

11 May https://www.nature.com/articles/s41598-022-11883-5 DOI https://doi.org/10.1038/s41598-022-11883-5

#### Spintronics: How an atom-thin insulator helps transport spins

10 May Spintronics: How an atom-thin insulator helps transport spins (phys.org) DOI: 10.1021/acs.nanolett.1c04358

#### Caesium: A rare element with huge potential in innovative technologies 12 May Caesium: A rare element with huge potential in innovative technologies (innovationnewsnetwork.com)

**Construction of boron-stereogenic compounds via enantioselective Cu-catalyzed desymmetric B–H bond insertion reaction | Nature Communications** 12 May

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Construction of boron-stereogenic compounds via enantioselective Cu-catalyzed desymmetric B–H bond insertion reaction | Nature Communications

https://www.nature.com/articles/s41467-022-30287-7 DOI https://doi.org/10.1038/s41467-022-30287-7

# Achieving large thermal hysteresis in an anthracene-based manganese(II) complex via photo-induced electron transfer | Nature Communications

12 May https://www.nature.com/articles/s41467-022-30425-1 DOI https://doi.org/10.1038/s41467-022-30425-1

#### **Cobalt tops Critical Materials Risk Index - MINING.COM**

12 May <u>https://www.mining.com/cobalt-tops-critical-materials-risk-index</u>

### Organophotoredox-catalyzed semipinacol rearrangement via radical-polar crossover | Nature Communications

13 May https://www.nature.com/articles/s41467-022-30395-4 DOI https://doi.org/10.1038/s41467-022-30395-4

Sodium and water react, and quantum physics explains why - Big Think 11 May

https://bigthink.com/starts-with-a-bang/sodium-and-water-react

### Fluorine nanostructures can desalinate water 2,400 times faster than carbon nanotubes

12 May

Fluorine nanostructures can desalinate water 2,400 times faster than carbon nanotubes (interestingengineering.com)

### **On the Edge: New Magnetic Phenomenon Discovered With Industrial Potential** 15 May

On the Edge: New Magnetic Phenomenon Discovered With Industrial Potential (scitechdaily.com) DOI: 10.1021/acs.nanolett.1c04665

#### **Developing a Sustainable Source of Squalene**

11 May Developing a Sustainable Source of Squalene | Technology Networks

### **Converting CO2 to formic acid using an alumina-supported, iron-based compound** 16 May

https://phys.org/news/2022-05-co2-formic-acid-alumina-supported-iron-based.html DOI: 10.1002/anie.202204948

# Scientists Developed a Method for Synthesizing Titanium-Based Nanocomposite Coatings

5 May Scientists Developed a Method for Synthesizing Titanium-Based Nanocomposite Coatings (urfu.ru)

#### Enantioselective Total Synthesis of (+)-Pepluanol A | Organic Letters

11 May

Enantioselective Total Synthesis of (+)-Pepluanol A | Organic Letters (acs.org)

### Synthesis of Amino Acid $\alpha$ -Thioethers and Late-Stage Incorporation into Peptides | Organic Letters

16 May https://pubs.acs.org/doi/10.1021/acs.orglett.2c01297 https://doi.org/10.1021/acs.orglett.2c01297

### New theory promises to reshape how we think about polymer superstructures 16 May

New theory promises to reshape how we think about polymer superstructures (phys.org) DOI: 10.1038/s41467-022-30343-2

#### Scientists uncovered a fundamental property of magnetism - Tech Explorist

14 May https://www.techexplorist.com/fundamental-property-magnetism/47358 DOI: <u>10.1038/s41467-022-29854-9</u>

### Guest alignment and defect formation during pore filling in metal-organic framework films

16 May

https://phys.org/news/2022-05-guest-alignment-defect-formation-pore.html DOI: 10.1002/anie.202201725

#### Improved method to make branched polymers

16 May https://phys.org/news/2022-05-method-polymers.html DOI: 10.1016/j.chempr.2022.02.022

#### **Chemical Exposure of Pregnant Women Is Rising**

10 May <u>Chemical Exposure of Pregnant Women Is Rising | Technology Networks</u> doi:<u>10.1021/acs.est.1c08942</u>

#### One statistical analysis must not rule them all

17 May <u>One statistical analysis must not rule them all (nature.com)</u> doi: https://doi.org/10.1038/d41586-022-01332-8

#### Producing High-Quality Graphene Cheaply Using Carbon Monoxide

19 May <u>Producing High-Quality Graphene Cheaply Using Carbon Monoxide (scitechdaily.com)</u> <u>DOI: 10.1002/advs.202200217</u>

#### Organic polymeric scintillators excite the X-ray community

17 May https://phys.org/news/2022-05-polymeric-scintillators-x-ray.html DOI: 10.1117/1.AP.4.3.035002

### New material can 'capture toxic pollutants from air' (Prof Michael Zaworotko, Bernal Chair of Crystal Engineering, UL)

18 May https://phys.org/news/2022-05-material-capture-toxic-pollutants-air.html

#### Science foundation and research council to merge in major shake-up 18 May https://www.irishtimes.com/news/education/science-foundation-and-research-council-to-merge-in-major-shake-up-1.4881295

#### Seeing Inside the MOF "Sardine Can"

17 May Seeing Inside the MOF "Sardine Can" | Technology Networks doi:10.1002/anie.202201725

#### $Sulfox Fluor-enabled\ deoxy azidation\ of\ alcohols\ with\ NaN3\ |\ Nature\ Communications$

15 May https://www.nature.com/articles/s41467-022-30132-x DOI https://doi.org/10.1038/s41467-022-30132-x

### Environmental toxins are worsening obesity pandemic, say scientists | Pollution | The Guardian

19 Mav

 $\underline{https://www.theguardian.com/environment/2022/may/19/environmental-toxins-are-worsening-obesity-pandemic-say-scientists}$ 

#### Chiral emergence in multistep hierarchical assembly of achiral conjugated polymers | Nature Communications

18 May https://www.nature.com/articles/s41467-022-30420-6 DOI https://doi.org/10.1038/s41467-022-30420-6

### Black carbon aerosol number and mass concentration measurements by picosecond short-range elastic backscatter lidar | Scientific Reports

19 May https://www.nature.com/articles/s41598-022-11954-7 DOI https://doi.org/10.1038/s41598-022-11954-7

### Octahedral oxide glass network in ambient pressure neodymium titanate | Scientific Reports

18 May https://www.nature.com/articles/s41598-022-12342-x DOI https://doi.org/10.1038/s41598-022-12342-x

### A New Enzyme Found in Compost Just Set a Speed Record For Breaking Down Plastic

19 May

A New Enzyme Found in Compost Just Set a Speed Record For Breaking Down Plastic (sciencealert.com)

### Low-Cost Battery-Like Device Captures Carbon Dioxide While It Charges 20 May

Low-Cost Battery-Like Device Captures Carbon Dioxide While It Charges | Technology Networks doi:10.1039/D2NR00748G

#### New Polymer Membrane Tech Improves Carbon Capture Efficiency 20 May

<u>New Polymer Membrane Tech Improves Carbon Capture Efficiency (scitechdaily.com)</u> DOI: 10.1126/science.abj9351

#### Synthesis of a Möbius carbon nanobelt | Nature Synthesis

19 May https://www.nature.com/articles/s44160-022-00075-8 DOI https://doi.org/10.1038/s44160-022-00075-8

### Integrating charge mobility, stability and stretchability within conjugated polymer films for stretchable multifunctional sensors | Nature Communications

18 May https://www.nature.com/articles/s41467-022-30361-0 DOI https://doi.org/10.1038/s41467-022-30361-0

#### **Light-controlled reactions at the nanoscale** 19 May

https://phys.org/news/2022-05-light-controlled-reactions-nanoscale.html DOI: 10.1364/OPTICA.453915

### Universal mechanism to explain formation of carbon nanoparticles in interstellar and terrestrial environments

16 May https://phys.org/news/2022-05-universal-mechanism-formation-carbon-nanoparticles.html DOI: 10.1021/jacs.1c08230

### From radial to unidirectional water pumping in zeta-potential modulated Nafion nanostructures | Nature Communications

19 May https://www.nature.com/articles/s41467-022-30554-7 DOI https://doi.org/10.1038/s41467-022-30554-7

### Structural transition and re-emergence of iron's total electron spin in (Mg, Fe)O at ultrahigh pressure | Nature Communications

19 May Structural transition and re-emergence of iron's total electron spin in (Mg,Fe)O at ultrahigh pressure | Nature Communications DOI https://doi.org/10.1038/s41467-022-30100-5

#### Researchers develop new measurement method in molecular electronics

19 May https://phys.org/news/2022-05-method-molecular-electronics.html DOI: 10.1002/anie.202203830

#### Mixing laser beams and X-ray beams

20 May https://phys.org/news/2022-05-laser-x-ray.html DOI: 10.1126/sciadv.abn5127. www.science.org/doi/10.1126/sciadv.abn5127

### Full article: Academics' perceptions of research impact and engagement through interactions on social media platforms

18 May

https://www.tandfonline.com/doi/full/10.1080/17439884.2022.2065298 https://doi.org/10.1080/17439884.2022.2065298

**Spin keeps electrons in line in iron-based superconductor** 19 May https://phys.org/news/2022-05-electrons-line-iron-based-superconductor.html DOI: 10.1038/s41567-022-01603-1

### High current density electroreduction of CO2 into formate with tin oxide nanospheres | Scientific Reports

19 May https://www.nature.com/articles/s41598-022-11890-6 DOI https://doi.org/10.1038/s41598-022-11890-6

#### A new class of bilayer kagome lattice compounds with Dirac nodal lines and pressureinduced superconductivity | Nature Communications

19 May https://www.nature.com/articles/s41467-022-30442-0 DOI https://doi.org/10.1038/s41467-022-30442-0

#### Highly Ion-Permselective Porous Organic Cage Membranes with Hierarchical Channels | Journal of the American Chemical Society

19 May https://pubs.acs.org/doi/10.1021/jacs.2c00318 https://doi.org/10.1021/jacs.2c00318

### Partial oxidation of methane to methanol on boron nitride at near critical acetonitrile | Scientific Reports

20 May https://www.nature.com/articles/s41598-022-12639-x DOI https://doi.org/10.1038/s41598-022-12639-x

# A Chlorine-Based Redox Electrochemical Capacitor | ACS Applied Materials & Interfaces

17 May https://pubs.acs.org/doi/10.1021/acsami.2c03951 https://doi.org/10.1021/acsami.2c03951

Long-hypothesized 'next generation wonder material' created for first time 21 May https://phys.org/news/2022-05-long-hypothesized-material.html DOI: 10.1038/s44160-022-00068-7

### Exceptionally high work density of a ferroelectric dynamic organic crystal around room temperature | Nature Communications

20 May https://www.nature.com/articles/s41467-022-30541-y

#### **Everyday Plastic Products – Such As Coffee Cups – Release Trillions of Microscopic Particles Into Water** 22 May 2022

Everyday Plastic Products – Such As Coffee Cups – Release Trillions of Microscopic Particles Into Water (scitechdaily.com) DOI: 10.1021/acs.est.1c06768

#### **Tiny Microdrones Propelled by Light-Driven Nanomotors**

22 May <u>Tiny Microdrones Propelled by Light-Driven Nanomotors (scitechdaily.com)</u> DOI: 10.1038/s41565-022-01099-z

#### Researchers unveil a secret of stronger metals

20 May Researchers unveil a secret of stronger metals (phys.org) DOI: 10.1038/s41563-022-01250-0

#### Methane Everywhere | Science | AAAS

20 May <u>https://www.science.org/content/blog-post/methane-everywhere</u> and <u>https://doi.org/10.1029/202...</u>

#### €440m Merck expansion to create 370 new jobs in Cork

23 May €440m Merck expansion to create 370 new jobs in Cork (siliconrepublic.com)

#### New Process Revolutionizes Microfluidic Fabrication

23 May <u>New Process Revolutionizes Microfluidic Fabrication | Technology Networks</u> 10.1038/s41467-022-29956-4

#### **PFAS May Not Be Forever After All**

23 May <u>PFAS May Not Be Forever After All | Technology Networks</u> doi:10.1021/acs.est.1c07608

#### Making advanced electronics with water

19 May https://techxplore.com/news/2022-05-advanced-electronics.html DOI: 10.1002/adfm.202109442

#### Conducting decay spectroscopy experiments at TRIUMF

20 May Conducting decay spectroscopy experiments at TRIUMF (innovationnewsnetwork.com)

### **New Polymer Membrane Tech Improves Carbon Capture Efficiency** 20 May

<u>New Polymer Membrane Tech Improves Carbon Capture Efficiency (scitechdaily.com)</u> DOI: 10.1126/science.abj9351

#### How Three Mutations Work Together To Spur New COVID-19 Variants 23 May How Three Mutations Work Together To Spur New COVID-19 Variants (scitechdaily.com) DOI: 10.1021/acs.biochem.2c00132

### New calculations of solar spectrum resolve decade-long controversy about the sun's chemical composition

23 May https://phys.org/news/2022-05-solar-spectrum-decade-long-controversy-sun.html DOI: 10.1051/0004-6361/202142971

# Chitosan-EDTA-Cellulose network as a green, recyclable and multifunctional biopolymeric organocatalyst for the one-pot synthesis of 2-amino-4H-pyran derivatives

23 May

Chitosan-EDTA-Cellulose network as a green, recyclable and multifunctional biopolymeric organocatalyst for the one-pot synthesis of 2-amino-4H-pyran derivatives | Scientific Reports (nature.com) DOI https://doi.org/10.1038/s41598-022-10774-z

### Researchers demonstrate organic crystals can serve as energy converters for emerging technologies

20 May

Researchers demonstrate organic crystals can serve as energy converters for emerging technologies (phys.org)

#### Synthesis and macrocyclization-induced emission enhancement of benzothiadiazolebased macrocycle | Nature Communications

23 May https://www.nature.com/articles/s41467-022-30121-0 DOI https://doi.org/10.1038/s41467-022-30121-0

# Effective hole conductivity in nitrogen-doped CVD-graphene by singlet oxygen treatment under photoactivation conditions | Scientific Reports

24 May https://www.nature.com/articles/s41598-022-12696-2 DOI https://doi.org/10.1038/s41598-022-12696-2

### How Researchers Are Bringing Sustainability to Scientific Discovery | Technology Networks

20 May How Researchers Are Bringing Sustainability to Scientific Discovery | Technology Networks

#### **Release of Floral Fragrance Visualized | Technology Networks**

25 May <u>Release of Floral Fragrance Visualized | Technology Networks</u> doi:<u>10.3389/fpls.2022.835305</u>

# Mechanochemical synthesis of magnesium-based carbon nucleophiles in air and their use in organic synthesis | Nature Communications

18 November 2021 https://www.nature.com/articles/s41467-021-26962-w

### A general strategy for C(sp3)–H functionalization with nucleophiles using methyl radical as a hydrogen atom abstractor | Nature Communications

29 November 2021 https://www.nature.com/articles/s41467-021-27165-z DOI https://doi.org/10.1038/s41467-021-27165-z

### Nickel-catalyzed electrochemical carboxylation of unactivated aryl and alkyl halides with CO2 | Nature Communications

6 December 2021 https://www.nature.com/articles/s41467-021-27437-8 DOI https://doi.org/10.1038/s41467-021-27437-8

### Electrochemical ammonia synthesis via nitrate reduction on Fe single atom catalyst | Nature Communications

17 May 2021 https://www.nature.com/articles/s41467-021-23115-x DOI https://doi.org/10.1038/s41467-021-23115-x

# Coordination environment dependent selectivity of single-site-Cu enriched crystalline porous catalysts in CO2 reduction to CH4 | Nature Communications

4 November 2021 https://www.nature.com/articles/s41467-021-26724-8 DOI https://doi.org/10.1038/s41467-021-26724-8

### **Electrochemical C–N bond activation for deaminative reductive coupling of Katritzky salts | Nature Communications**

19 November 2021 https://www.nature.com/articles/s41467-021-27060-7 DOI https://doi.org/10.1038/s41467-021-27060-7

#### **Transition metal-doped Ni-rich layered cathode materials for durable Li-ion batteries** | Nature Communications

12 November 2021 https://www.nature.com/articles/s41467-021-26815-6 DOI https://doi.org/10.1038/s41467-021-26815-6

#### **Engineering single-atomic ruthenium catalytic sites on defective nickel-iron layered double hydroxide for overall water splitting | Nature Communications** 28 July 2021

https://www.nature.com/articles/s41467-021-24828-9 DOI https://doi.org/10.1038/s41467-021-24828-9

### Moving beyond bimetallic-alloy to single-atom dimer atomic-interface for all-pH hydrogen evolution | Nature Communications

19 November 2021 https://www.nature.com/articles/s41467-021-27145-3 DOI https://doi.org/10.1038/s41467-021-27145-3

#### Coating of a Novel Lithium-Containing Hybrid Oligomer Additive on Nickel-Rich LiNi0.8Co0.1Mn0.1O2 Cathode Materials for High-Stability and High-Safety Lithium-Ion Batteries | ACS Sustainable Chemistry & Engineering

24 May https://pubs.acs.org/doi/10.1021/acssuschemeng.2c01712 https://doi.org/10.1021/acssuschemeng.2c01712

#### Spongy material captures carbon dioxide in cavities

23 May Spongy material captures carbon dioxide in cavities | Cornell Chronicle

#### Upcycling end-of-life vehicle waste plastic into flash graphene

26 May

Upcycling end-of-life vehicle waste plastic into flash graphene | Communications Engineering (nature.com) DOI https://doi.org/10.1038/s44172-022-00006-7

### **3D Printing: Scientists can now grow wood in a lab without cutting a single tree** 26 May

<u>3D Printing: Scientists can now grow wood in a lab without cutting a single tree (interestingengineering.com)</u>

#### NovaUCD student entrepreneur programme kicks off - TechCentral.ie

25 May NovaUCD student entrepreneur programme kicks off - TechCentral.ie

# An Entirely New Kind of Highly Reactive Chemicals Has Been Found in The Atmosphere

24 May

https://www.sciencealert.com/an-entirely-new-class-of-highly-reactive-chemical-has-been-found-in-the-atmosphere DOI: 10.1126/science.abn60

# Intramolecular hydroxyl nucleophilic attack pathway by a polymeric water oxidation catalyst with single cobalt sites | Nature Catalysis

25 May Intramolecular hydroxyl nucleophilic attack pathway by a polymeric water oxidation catalyst with single cobalt sites | Nature Catalysis DOI https://doi.org/10.1038/s41929-022-00783-6

#### Sustainable and Efficient Manufacturing of Metal-Organic Framework-Based Polymer Nanocomposites by Reactive Extrusion | ACS Sustainable Chemistry & Engineering

20 May

Sustainable and Efficient Manufacturing of Metal-Organic Framework-Based Polymer Nanocomposites by Reactive Extrusion | ACS Sustainable Chemistry & Engineering https://doi.org/10.1021/acssuschemeng.2c01720

#### Sustainable and Efficient Manufacturing of Metal-Organic Framework-Based Polymer Nanocomposites by Reactive Extrusion

20 May

Sustainable and Efficient Manufacturing of Metal-Organic Framework-Based Polymer Nanocomposites by Reactive Extrusion | ACS Sustainable Chemistry & Engineering

#### Highly stretchable electroluminescent device based on copper nanowires electrode | Scientific Reports

27 May

Highly stretchable electroluminescent device based on copper nanowires electrode | Scientific Reports (nature.com) DOI https://doi.org/10.1038/s41598-022-13167-4

#### New route to build materials out of tiny particles

27 May New route to build materials out of tiny particles (phys.org) DOI: 10.1126/sciadv.abm0548.

### Toward customizable timber, grown in a lab | MIT News | Massachusetts Institute of Technology

25 May Toward customizable timber, grown in a lab | MIT News | Massachusetts Institute of Technology

# The electro-oxidation of primary alcohols via a coral-shaped cobalt metal–organic framework modified graphite electrode in neutral media | Scientific Reports 20 May

https://www.nature.com/articles/s41598-022-12200-w DOI https://doi.org/10.1038/s41598-022-12200-w

#### New light-powered catalysts could aid in manufacturing

27 May https://phys.org/news/2022-05-light-powered-catalysts-aid.html DOI: 10.1038/s41467-022-29811-6

#### Semiconductor makers inspire chemical investments

27 May <a href="https://cen.acs.org/materials/electronic-materials/Semiconductor-makers-inspire-chemical-investments/100/i19">https://cen.acs.org/materials/electronic-materials/Semiconductor-makers-inspire-chemical-investments/100/i19</a>

#### China drags down entire industrials metals complex - report - MINING.COM

27 May China drags down entire industrials metals complex – report - MINING.COM

#### Möbius Carbon Nanobelt: A Möbius Strip Constructed Solely of Carbon Atoms

28 May <u>Möbius Carbon Nanobelt: A Möbius Strip Constructed Solely of Carbon Atoms (scitechdaily.com)</u> DOI: 10.1038/s44160-022-00075-8

#### Shape and interaction decoupling for colloidal preassembly

27 May https://www.science.org/doi/10.1126/sciadv.abm0548 DOI: 10.1126/sciadv.abm05

#### Government legislation on radon gas testing likely Ireland

28 May Government legislation on radon gas testing likely (rte.ie)
# Electrochemical oxygen reduction to hydrogen peroxide at practical rates in strong acidic media | Nature Communications

24 May

https://www.nature.com/articles/s41467-022-30337-0 DOI https://doi.org/10.1038/s41467-022-30337-0

# Student dropout rates climb across several universities amid concern over low engagement – The Irish Times

28 May

Student dropout rates climb across several universities amid concern over low engagement – The Irish Times

#### **Topological Materials Are Everywhere – New Database Reveals Over 90,000** 23 May

<u>Topological Materials Are Everywhere – New Database Reveals Over 90,000 (scitechdaily.com)</u> DOI: 10.1126/science.abg9094

# **Magnetic fields generate intricate periodic trends** | **Research** | **Chemistry World** 24 May

https://www.chemistryworld.com/news/magnetic-fields-generate-intricate-periodic-trends/4015717.article

### Electropolymerization without an electric power supply

27 May

Electropolymerization without an electric power supply | Communications Chemistry (nature.com) DOI https://doi.org/10.1038/s42004-022-00682-8

### Is liquid metal a key to carbon capture? | Upstream Online

23 May Is liquid metal a key to carbon capture? | Upstream Online

### New Artificial Enzyme Shows Potential for New Renewable Energy Source 31 May

New Artificial Enzyme Shows Potential for New Renewable Energy Source (scitechdaily.com) DOI: 10.1038/s41467-022-30285-9

### Has the 'great resignation' hit academia?

31 May <u>Has the 'great resignation' hit academia? (nature.com)</u> doi: https://doi.org/10.1038/d41586-022-01512-6

### **Russian Academics Aim to Punish Colleagues Who Backed Ukraine Invasion** 27 May

Russian Academics Aim to Punish Colleagues Who Backed Ukraine Invasion - The New York Times (nytimes.com)

# BT Young Scientist & Technology Exhibition returns as live event for 2023 - TechCentral.ie

31 May BT Young Scientist & Technology Exhibition returns as live event for 2023 - TechCentral.ie

### Observation of an intermediate state during lithium intercalation of twisted bilayer MoS2 | Nature Communications

30 May

Observation of an intermediate state during lithium intercalation of twisted bilayer MoS2 | Nature Communications DOI https://doi.org/10.1038/s41467-022-30516-z

# A Major Science Journal Publisher Adds A Weird Notice To Every Paper. What's Behind This?

30 May

A Major Science Journal Publisher Adds A Weird Notice To Every Paper. What's Behind This? (forbes.com)

### **Carbon-Carbon Bond Formation: The Houk/Cai Synthesis of Artemisinin**

30 May

https://www.organic-chemistry.org/Highlights/2022/30May.shtm



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### Medicinal Chemistry, Chemical Biology & Life Sciences

**Early Development Medicinal Chemistry: Utilizing Data and Artificial Intelligence** 3 April Early Development Medicinal Chemistry: Utilizing Data and Artificial Intelligence (pharmtech.com)

### More Than Active Sites (evolution of medicinal chemistry)

4 April More Than Active Sites | Science | AAAS

# Improving the specificity of nucleic acid detection with endonuclease-actuated degradation | Communications Biology

31 March Improving the specificity of nucleic acid detection with endonuclease-actuated degradation | Communications Biology (nature.com) DOI https://doi.org/10.1038/s42003-022-03242-x

### "Secret Doors" on Human Proteins Could Open Up New Drug Opportunities

7 April <u>"Secret Doors" on Human Proteins Could Open Up New Drug Opportunities | Technology Networks</u> doi: 10.1038/s41586-022-04586-4.

### **Industry Insight - The Bright Future of mRNA**

1 April The Bright Future of mRNA | Technology Networks

# **Cryo-EM imaging of a key immune protein reveals previously unrecognized binding site**

6 April

https://www.news-medical.net/news/20220406/Cryo-EM-imaging-of-a-key-immune-protein-reveals-a-previouslyunrecognized-binding-site.aspx doi.org/10.1038/s41586-022-04559-7

# Design and optimization of metformin hydrophobic ion pairs for efficient encapsulation in polymeric drug carriers | Scientific Reports

6 April https://www.nature.com/articles/s41598-022-09384-6 DOI https://doi.org/10.1038/s41598-022-09384-6

# **Revolutionary DNA Nanotechnology Speeds Up Development of Vaccines by More Than One Million Times**

4 April <u>Revolutionary DNA Nanotechnology Speeds Up Development of Vaccines by More Than One Million Times</u> (scitechdaily.com) DOI: 10.1038/s41557-022-00912-5

# Chemical Compound Promotes Healthy Aging – Add Muscle, Strength and Energy While Losing Fat

7 April

<u>Chemical Compound Promotes Healthy Aging – Add Muscle, Strength and Energy While Losing Fat</u> (scitechdaily.com) <u>DOI: 10.1002/jcsm.12982</u>

### Peering into the structure of antibiotic resistance

7 April https://phys.org/news/2022-04-peering-antibiotic-resistance.html DOI: 10.1073/pnas.2123268119

### Chemical compound promotes healthy aging

7 April <u>https://medicalxpress.com/news/2022-04-chemical-compound-healthy-aging.html</u> DOI: 10.1002/jcsm.12982

# Researchers identified over 5,500 new viruses in the ocean, including a missing link in viral evolution

7 April <u>Researchers identified over 5,500 new viruses in the ocean, including a missing link in viral evolution</u> (theconversation.com)

### Black pepper: healthy or not?

8 April Black pepper: healthy or not? (theconversation.com)

### Snakebite antivenoms step into the future

10 April Snakebite antivenoms step into the future | Drug Discovery News

#### Semen Analysis Finds COVID-19 Alters Levels of Fertility-Related Proteins 8 April

Semen Analysis Finds COVID-19 Alters Levels of Fertility-Related Proteins | Technology Networks doi: 10.1021/acsomega.1c06551

### Abundant "Secret Doors" on Human Proteins Could Be Game-Changer for Drug Discovery

11 April Abundant "Secret Doors" on Human Proteins Could Be Game-Changer for Drug Discovery (scitechdaily.com) DOI: 10.1038/s41586-022-04586-4

### Inspiration and thinking in the design of large-scale functional proteins: Evolutionguided atomistic design

6 April <u>https://phys.org/news/2022-04-large-scale-functional-proteins-evolution-guided-atomistic.html</u> DOI: 10.34133/2022/9787581

### Artificial organelles based on hybrid protein nanoparticles

7 April https://phys.org/news/2022-04-artificial-organelles-based-hybrid-protein.html

### **Risks of Counterfeit Medications Are Rising: New Technology Could Spot Fakes** With a Smartphone App

13 April Chemistry News - SciTechDaily DOI: 10.1021/acscentsci.1c01233

# This 'Supercluster' From a Rare Soil Microbe Could Yield Some Amazing New Drugs

12 April This 'Supercluster' From a Rare Soil Microbe Could Yield Some Amazing New Drugs (sciencealert.com)

### Probing the Proteome With Engineered Nanoparticles | Technology Networks

7 April Probing the Proteome With Engineered Nanoparticles | Technology Networks

#### **E-Cigarettes May Modify Inflammatory State Across Multiple Organ Systems** 13 April

E-Cigarettes May Modify Inflammatory State Across Multiple Organ Systems | Technology Networks doi: 10.7554/eLife.67621

### What's next for AlphaFold and the AI protein-folding revolution

13 April <u>What's next for AlphaFold and the AI protein-folding revolution (nature.com)</u> doi: https://doi.org/10.1038/d41586-022-00997-5

### Structure of active human telomerase with telomere shelterin protein TPP1 | Nature

(May need subscription) 13 April <u>Structure of active human telomerase with telomere shelterin protein TPP1 | Nature</u> DOI https://doi.org/10.1038/s41586-022-04582-8

### Nanoparticles Could Enable a More Sensitive and Durable Rapid COVID-19 Test

14 April Nanoparticles Could Enable a More Sensitive and Durable Rapid COVID-19 Test | Technology Networks doi: 10.1021/acssensors.2c00100

#### **Probing the Proteome With Engineered Nanoparticles**

7 April Probing the Proteome With Engineered Nanoparticles | Technology Networks

### Drug Solutions Podcast: Drug Manufacturing Technology (Podcast)

5 April Drug Solutions Podcast: Drug Manufacturing Technology (pharmtech.com)

#### Predicting Toxicity in Drug Development (Plus extra)

2 February <u>Predicting Toxicity in Drug Development (pharmtech.com)</u>

#### The State of Phage Therapy (Plus extra)

3 March The State of Phage Therapy (pharmtech.com)

#### **Omega-3 Health Benefits: Why Are These Fatty Acids So Important?** 16 April

Omega-3 Health Benefits: Why Are These Fatty Acids So Important? (scitechdaily.com)

### New Engineered Bacteria Could Prevent Side Effects of Antibiotics

16 April <u>New Engineered Bacteria Could Prevent Side Effects of Antibiotics (scitechdaily.com)</u> DOI: 10.1038/s41551-022-00871-9

# Engineering and validation of a dual luciferase reporter system for quantitative and systematic assessment of regulatory sequences in Chinese hamster ovary cells | Scientific Reports

11 April

Engineering and validation of a dual luciferase reporter system for quantitative and systematic assessment of regulatory sequences in Chinese hamster ovary cells | Scientific Reports (nature.com) DOI https://doi.org/10.1038/s41598-022-09887-2

# Substance Derived From Licorice May Have Anti-Inflammatory and Anti-Cancer Effects

17 April

Substance Derived From Licorice May Have Anti-Inflammatory and Anti-Cancer Effects (scitechdaily.com) DOI: 10.1016/j.phrs.2022.106138

### The Bright Future of mRNA

1 April The Bright Future of mRNA | Technology Networks

### Drug discovery with explainable artificial intelligence

13 October 2020 Drug discovery with explainable artificial intelligence | Nature Machine Intelligence DOI https://doi.org/10.1038/s42256-020-00236-4

# New Drugs for Bad Bugs: From Rare Soil Microbe, a New Antibiotic Candidate for Drug-Resistant Infections

19 April New Drugs for Bad Bugs: From Rare Soil Microbe, a New Antibiotic Candidate for Drug-Resistant Infections (scitechdaily.com) DOI: 10.1073/pnas.2117941119

#### Semen Analysis Finds COVID-19 Alters Levels of Fertility-Related Proteins 8 April

Semen Analysis Finds COVID-19 Alters Levels of Fertility-Related Proteins | Technology Networks doi: <u>10.1021/acsomega.1c06551</u>

# Nanocapsule carrying a CRISPR-Cas9 editing tool used for noninvasive brain delivery and tumor cell targeting

21 April Nanocapsule carrying a CRISPR-Cas9 editing tool used for noninvasive brain delivery and tumor cell targeting (phys.org) DOI: 10.1126/sciadv.abm8011

### Learning Chemical Networks Give Life a Chiral Twist – Symmetry Breaking To Optimize Energy Harvesting

26 April

Learning Chemical Networks Give Life a Chiral Twist – Symmetry Breaking To Optimize Energy Harvesting (scitechdaily.com) DOI: 10.1038/s41467-022-29952-8

#### **Team Biosynthesizes Anticancer Compound Found in Australian Stinging Tree** 22 April

Team Biosynthesizes Anticancer Compound Found in Australian Stinging Tree | Technology Networks doi: 10.1021/jacs.2c00014

### **Microrobot collectives with reconfigurable morphologies, behaviors, and functions** 26 April

Microrobot collectives with reconfigurable morphologies, behaviors, and functions | Nature Communications DOI https://doi.org/10.1038/s41467-022-29882-5

### **Exploring the Evolution of Protein Translation**

22 April Exploring the Evolution of Protein Translation | Technology Networks doi: 10.3390/life12040573

# Allele-specific collateral and fitness effects determine the dynamics of fluoroquinolone resistance evolution

27 April Allele-specific collateral and fitness effects determine the dynamics of fluoroquinolone resistance evolution | PNAS https://doi.org/10.1073/pnas.2121768119

### **Identifying Risk Factors for Long COVID With Single-Cell Proteomics**

27 April Identifying Risk Factors for Long COVID With Single-Cell Proteomics | Technology Networks

### Antibiotics diminish babies' immune response to key vaccines

27 April Antibiotics diminish babies' immune response to key vaccines | Science News

# Structure of the active pharmaceutical ingredient bismuth subsalicylate (The secret of Pepto-Bismol)

2022

Structure of the active pharmaceutical ingredient bismuth subsalicylate | Nature Communications https://doi.org/10.1038/s41467-022-29566-0

### **Early Ukrainian Women Scientists: Part 1 – From Fossils to the Planets and Back** 27 April

Early Ukrainian Women Scientists: Part 1 – From Fossils to the Planets and Back - Absolutely Maybe (plos.org)

### How Paxlovid came to be: From the germ of an idea to a vital tool against Covid 28 April

How Paxlovid came to be: From idea to a vital tool against Covid (statnews.com) (30 day free sub to read)

### Chemical Markers Could "Unlock" Future Therapeutic Uses of mRNA

IRISH CHEMICAL NEWS ISSUE NO.2 MAY/ JUNE 2022

27 April <u>Chemical Markers Could "Unlock" Future Therapeutic Uses of mRNA | Technology Networks</u> doi: <u>10.1126/sciadv.abm8501</u>

# Plant Protein Kills Bacterial Cells – New Model for Antibacterial Mechanism Could Result in New Antibiotics

29 April <u>Plant Protein Kills Bacterial Cells – New Model for Antibacterial Mechanism Could Result in New Antibiotics</u> (scitechdaily.com) DOI: 10.1371/journal.pone.0258794

### **Biochemists Identify How Genome Organization Influences Cell Fate**

29 April Biochemists Identify How Genome Organization Influences Cell Fate (scitechdaily.com) DOI: 10.1038/s41467-022-29730-6

# Conserved and divergent chaperoning effects of Hsp60/10 chaperonins on protein folding landscapes | PNAS

29 April https://www.pnas.org/doi/10.1073/pnas.2118465119 https://doi.org/10.1073/pnas.2118465119

### New technique shows in detail where drug molecules hit their targets in the body 29 April

https://phys.org/news/2022-04-technique-drug-molecules-body.html DOI: 10.1016/j.cell.2022.03.040

# Methods for testing solubility of hydraulic calcium silicate cements for root-end filling | Scientific Reports

2 May https://www.nature.com/articles/s41598-022-11031z?utm\_source=srep\_etoc&utm\_medium=email&utm\_campaign=toc\_41598\_12\_1\_20220503&utm\_content=PS\_1 DOI https://doi.org/10.1038/s41598-022-11031-z

### How equal charges in enzymes control biochemical reactions

25 April https://phys.org/news/2022-04-equal-enzymes-biochemical-reactions.html DOI: 10.1038/s41929-022-00771-w

### **Endocrine Disruptor Exposure a Threat for Mother and Baby** 29 April

Endocrine Disruptor Exposure a Threat for Mother and Baby | Technology Networks doi:<u>10.1016/j.envres.2021.112435</u>

### Native Plants Used To Detox PFAS-Contaminated Water

3 May Native Plants Used To Detox PFAS-Contaminated Water | Technology Networks doi:10.1016/j.jhazmat.2022.128326

# **Bioinorganic Chemistry on Electrodes: Methods to Functional Modeling | Journal of the American Chemical Society**

3 May https://pubs.acs.org/doi/10.1021/jacs.2c01842 https://doi.org/10.1021/jacs.2c01842

### **Speeding Up Development for Traditional Biologics**

3 May Speeding Up Development for Traditional Biologics (pharmtech.com)

# Aptamer loaded superparamagnetic beads for selective capturing and gentle release of activated protein C

30 April Aptamer loaded superparamagnetic beads for selective capturing and gentle release of activated protein C | Scientific Reports (nature.com) DOI https://doi.org/10.1038/s41598-022-11198-5

### Failed Clinical Trial Leads to Scientific Breakthrough: Investigating Cancer Drug Toxicity Leads to Critical Discovery

4 May Failed Clinical Trial Leads to Scientific Breakthrough: Investigating Cancer Drug Toxicity Leads to Critical Discovery (scitechdaily.com) DOI: 10.1038/s41586-022-04685-2

# Nanotechnology Enables 3D Visualization of Crucial RNA Structures at Near-Atomic Resolution

5 May https://scitechdaily.com/nanotechnology-enables-3d-visualization-of-crucial-rna-structures-at-near-atomicresolution DOI: 10.1038/s41592-022-01455-w

### **A New Way To Produce Compounds for Pharmaceuticals and Natural Products** 4 May

A New Way To Produce Compounds for Pharmaceuticals and Natural Products | Technology Networks doi: <u>10.1126/science.abo0039</u>

### **Takeda stem cell facility puts Irish pharma at cutting edge of modern medicine** 6 May

https://www.irishtimes.com/business/health-pharma/takeda-stem-cell-facility-puts-irish-pharma-at-cutting-edge-ofmodern-medicine-1.4871211

# Weird Quantum Tunnelling Effect May Explain Spontaneous DNA Mutations | IFLScience

6 May

https://www.iflscience.com/health-and-medicine/weird-quantum-tunnelling-effect-may-explain-spontaneous-dnamutations

# Finding microbes that produce diverse chemistry | Nature Portfolio Microbiology Community

2 May

http://microbiologycommunity.nature.com/posts/finding-microbes-that-produce-diverse-chemistry and https://www.nature.com/articles/s41564-022-01110-2

# A double-layered liquid metal-based electrochemical sensing system on fabric as a wearable detector for glucose in sweat | Microsystems & Nanoengineering 7 May

https://www.nature.com/articles/s41378-022-00365-3 DOI https://doi.org/10.1038/s41378-022-00365-3

# Cu and Ni Co-sputtered heteroatomic thin film for enhanced nonenzymatic glucose detection

7 May

Cu and Ni Co-sputtered heteroatomic thin film for enhanced nonenzymatic glucose detection | Scientific Reports (nature.com)

DOI https://doi.org/10.1038/s41598-022-11563-4

# Nanoparticles are the future of medicine – researchers are experimenting with new ways to design tiny particle treatments for cancer

4 May

 $\frac{https://the conversation.com/nanoparticles-are-the-future-of-medicine-researchers-are-experimenting-with-new-ways-to-design-tiny-particle-treatments-for-cancer-180009$ 

### China expands control over genetic data used in scientific research

6 May

<u>China expands control over genetic data used in scientific research (nature.com)</u> doi: https://doi.org/10.1038/d41586-022-01230-z

### An open invitation to the Understudied Proteins Initiative

9 May <u>An open invitation to the Understudied Proteins Initiative | Nature Biotechnology</u> DOI https://doi.org/10.1038/s41587-022-01316-z

### Antimicrobial adhesive films by plasma-enabled polymerisation of m-cresol | Scientific Reports

9 May

Antimicrobial adhesive films by plasma-enabled polymerisation of m-cresol | Scientific Reports (nature.com) DOI https://doi.org/10.1038/s41598-022-11400-8

# Stress-induced protein disaggregation in the endoplasmic reticulum catalysed by BiP | Nature Communications

6 May https://www.nature.com/articles/s41467-022-30238-2

### Quantum biology explains DNA mutations

10 May Quantum biology in your DNA (cosmosmagazine.com)

### **Carbon Dots in Bioimaging, Biosensing and Therapeutics: A Comprehensive Review** - Wang - - Small Science - Wiley Online Library

8 May Carbon Dots in Bioimaging, Biosensing and Therapeutics: A Comprehensive Review - Wang - - Small Science -Wiley Online Library https://onlinelibrary.wiley.com/doi/10.1002/smsc.202200012

# **Revealed** mechanism underlying progression to severe COVID-19 in lungs; possible novel therapeutic targets

11 May 2022 <u>Revealed mechanism underlying progression to severe COVID-19 in lungs; possible novel therapeutic targets |</u> <u>AGÊNCIA FAPESP</u>

### Crystal study may resolve DNA mystery

9 May https://phys.org/news/2022-05-crystal-dna-mystery.html DOI: 10.1038/s41467-022-30005-3

# Molecular basis for cooperative binding and synergy of ATP-site and allosteric EGFR inhibitors | Nature Communications

9 May https://www.nature.com/articles/s41467-022-30258-y DOI https://doi.org/10.1038/s41467-022-30258-y

### Molecular architecture of the human caveolin-1 complex

11 May https://www.science.org/doi/10.1126/sciadv.abn7232 DOI: 10.1126/sciadv.abn7232

### Tracing the structural evolution of quasi-freestanding germanene on Ag(111) | Scientific Reports

9 May https://www.nature.com/articles/s41598-022-10943-0 DOI https://doi.org/10.1038/s41598-022-10943-0

### The structure of caveolin finally takes shape

11 May <u>The structure of caveolin finally takes shape (science.org)</u> DOI: 10.1126/sciadv.abq6985

### A smart ball sensor fabricated by laser kirigami of graphene for personalized longterm grip strength monitoring | npj Flexible Electronics

12 May https://www.nature.com/articles/s41528-022-00156-w DOI https://doi.org/10.1038/s41528-022-00156-w

#### **Screening Strategies Used in Drug Discovery**

29 September 2021 Screening Strategies Used in Drug Discovery | Technology Networks

# Laboratory mice are usually distressed and overweight, calling into question research findings

12 May Laboratory mice are usually distressed and overweight, calling into question research findings (theconversation.com)

### **Synthetic Biology: The \$3.6 Trillion Science Changing Life as We Know It** 10 May

https://www.visualcapitalist.com/synthetic-biology-3-6-trillion-change-life

# Establishment of H3K9-methylated heterochromatin and its functions in tissue differentiation and maintenance | Nature Reviews Molecular Cell Biology

13 May https://www.nature.com/articles/s41580-022-00483-w DOI https://doi.org/10.1038/s41580-022-00483-w

#### **Drug Solutions Podcast: Biologic Drug Development and Manufacturing (Podcast)** 4 May

Drug Solutions Podcast: Biologic Drug Development and Manufacturing (pharmtech.com)

### Crystal study may resolve DNA mystery

9 May Crystal study may resolve DNA mystery | Rice News | News and Media Relations | Rice University

# mRNA Unlocked: How Technology Convergence Is Driving the Next Wave | Fierce Biotech

16 May

https://www.fiercebiotech.com/sponsored/mrna-unlocked-how-technology-convergence-driving-next-wave

# Diabetes: Protein gel could help treat type 1 diabetes by preventing transplanted pancreatic cells from being rejected | New Scientist

13 May

Diabetes: Protein gel could help treat type 1 diabetes by preventing transplanted pancreatic cells from being rejected New Scientist

#### **Electrochemical Biosensor Detects Prostate Cancer | Technology Networks** 18 May

Electrochemical Biosensor Detects Prostate Cancer | Technology Networks doi: 10.1002/adma.202200981

### Logica: Transformative Drug Design (introduction to company proving Webinar)

Logica: Transformative Drug Design- AI Powered Drug Discovery | Charles River (criver.com)

Webinar:

# Extending the lifespan of artificial cell membranes from five days to almost two months

18 May

Extending the lifespan of artificial cell membranes from five days to almost two months (phys.org) DOI: 10.1038/s41467-022-28960-y

### **Texas A&M AgriLife describes new protein structures to aid rational drug design** 16 May

Texas A&M AgriLife describes new protein structures to aid rational drug design - AgriLife Today (tamu.edu)

# Can Quantum Mechanics Explain Why DNA Spontaneously Mutates? | Technology Networks

6 May

Can Quantum Mechanics Explain Why DNA Spontaneously Mutates? | Technology Networks doi: 10.1038/s42005-022-00881-8.

# Templated folding of the RTX domain of the bacterial toxin adenylate cyclase revealed by single molecule force spectroscopy | Nature Communications

19 May https://www.nature.com/articles/s41467-022-30448-8 DOI https://doi.org/10.1038/s41467-022-30448-8

### **Phosphoinositides as membrane organizers** | **Nature Reviews Molecular Cell Biology** 19 May

https://www.nature.com/articles/s41580-022-00490-x DOI https://doi.org/10.1038/s41580-022-00490-x

# Nanobiotics: New machine learning model predicts how nanoparticles interact with proteins

16 May https://phys.org/news/2022-05-nanobiotics-machine-nanoparticles-interact-proteins.html DOI: 10.1038/s43588-022-00229-w DOI: 10.1038/s43588-022-00230-3

### **Enzyme Electric Fields | Science | AAAS**

17 May https://www.science.org/content/blog-post/enzyme-electric-fields

### Ultrathin Fuel Cell Generates Electricity From Your Body's Own Sugar

22 May <u>Ultrathin Fuel Cell Generates Electricity From Your Body's Own Sugar (scitechdaily.com)</u> DOI: 10.1002/adma.202109075

# New hope for drugs to treat Alzheimer's after breakthrough by scientist at UCD - Independent.ie

23 May New hope for drugs to treat Alzheimer's after breakthrough by scientist at UCD - Independent.ie

# Zinc is a metal essential to life – scientists have discovered a protein that helps keep cells alive when zinc levels are low

17 May

Zinc is a metal essential to life – scientists have discovered a protein that helps keep cells alive when zinc levels are low (theconversation.com)

### EMA releases final guideline on antibacterial drug development

24 May EMA releases final guideline on antibacterial drug development | RAPS

### Why a Potent Banana Scent Stresses Out Male Mice

25 May

# A novel mechanism for the loss of mRNA activity in lipid nanoparticle delivery systems | Nature Communications

22 November2021 https://www.nature.com/articles/s41467-021-26926-0 DOI https://doi.org/10.1038/s41467-021-26926-0

# Proliferating coacervate droplets as the missing link between chemistry and biology in the origins of life | Nature Communications

24 September 2021 https://www.nature.com/articles/s41467-021-25530-6 DOI https://doi.org/10.1038/s41467-021-25530-6

# Gene editing enables rapid engineering of complex antibiotic assembly lines | Nature Communications

25 November 2021 https://www.nature.com/articles/s41467-021-27139-1 DOI https://doi.org/10.1038/s41467-021-27139-1

### Life's First Peptides May Have Grown on RNA Strands

24 May 2022 Life's First Peptides May Have Grown on RNA | Quanta Magazine

### Organoids: A new window into disease, development and discovery

7 November 2017 Organoids: A new window into disease, development and discovery | Harvard Stem Cell Institute (HSCI)

### **Key Applications of Organoids**

29 August 2019 Key Applications of Organoids (crownbio.com)

# Organoid technology in disease modelling, drug development, personalized treatment and regeneration medicine

5 December 2018

Organoid technology in disease modelling, drug development, personalized treatment and regeneration medicine | Experimental Hematology & Oncology | Full Text (biomedcentral.com)

#### **3D** printed protein-based robotic structures actuated by molecular motor assemblies | Nature Materials

26 May

<u>3D printed protein-based robotic structures actuated by molecular motor assemblies | Nature Materials</u> DOI https://doi.org/10.1038/s41563-022-01258-6

#### **First Potential Biomarker for Sudden Infant Death Syndrome Identified** 17 May

First Potential Biomarker for Sudden Infant Death Syndrome Identified | Technology Networks doi: 10.1016/j.ebiom.2022.104041

#### **Nanosensor Platform Could Advance Detection of Ovarian Cancer** 17 May

Nanosensor Platform Could Advance Detection of Ovarian Cancer | Technology Networks doi: Error! Hyperlink reference not valid.

### **Electrochemical Biosensor Detects Prostate Cancer**

18 May <u>Electrochemical Biosensor Detects Prostate Cancer | Technology Networks</u> doi: 10.1002/adma.202200981

# Molecular mechanism of the wake-promoting agent TAK-925 | Nature Communications

25 May <u>Molecular mechanism of the wake-promoting agent TAK-925 | Nature Communications</u> DOI https://doi.org/10.1038/s41467-022-30601-3

### Flagship startup launches claiming discovery of thousands of new proteins

(subscription?) 26 May Flagship startup launches claiming discovery of thousands of new proteins (statnews.com)

### New method allows easy, versatile synthesis of lactone molecules

27 May New method allows easy, versatile synthesis of lactone molecules (phys.org) DOI: 10.1126/science.abq3048

### Fruit fly experiments shed new light on dangers of plastic ingestion

24 May Fruit fly experiments shed new light on dangers of plastic ingestion (newatlas.com)

### **Sugar-Studded Protein Linked to Alzheimer's Disease - Neuroscience News** 27 May

Sugar-Studded Protein Linked to Alzheimer's Disease - Neuroscience News

### LEARNING FROM NATURE: BIOSYNTHESIS OF CYANOBACTERIN OPENS UP NEW CLASS OF NATURAL COMPOUNDS FOR APPLICATIONS IN MEDICINE AND AGRICULTURE

27 May

Learning from Nature: Biosynthesis of cyanobacterin opens up new class of natural compounds for applications in medicine and agriculture — TU Dresden — TU Dresden (tu-dresden.de)

# Drug Solutions Podcast: FDA Weighs in on Advancing the Science of Pharmaceutical Manufacturing

17 May

Drug Solutions Podcast: FDA Weighs in on Advancing the Science of Pharmaceutical Manufacturing (pharmtech.com)

#### **Nanofibrous materials affect the reaction of cytotoxicity assays | Scientific Reports** 31 May

Nanofibrous materials affect the reaction of cytotoxicity assays | Scientific Reports (nature.com) DOI https://doi.org/10.1038/s41598-022-13002-w

**Researchers discover how a workhorse protein keeps protein production on track** 31 May https://www.news-medical.net/news/20220531/Researchers-discover-how-a-workhorse-protein-keeps-proteinproduction-on-track.aspx doi.org/10.7554/eLife.76908

# **Frontiers | Molecular and Computational Strategies to Increase the Efficiency of CRISPR-Based Techniques | Plant Science**

31 May https://www.frontiersin.org/articles/10.3389/fpls.2022.868027/full

# Highly stable and tunable peptoid/hemin enzymatic mimetics with natural peroxidase-like activities | Nature Communications

31 May https://www.nature.com/articles/s41467-022-30285-9 DOI https://doi.org/10.1038/s41467-022-30285-9

### How digital helps a life sciences leader move at light speed

31 May The role of digital in vaccine development: An interview with Lidia Fonseca | McKinsey





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General Laboratory

- Analytical & Weighing Solutions
- Industrial & Vacuum Solutions
- Weighing and Mass Calibration
- Complete Service Solutions
- ISO 17025 INAB Accrediation



### Climate Change, Environment, Sustainability & Related Topics

### **Opinion: The EU must learn from its failed gas policy**

2 March Opinion: The EU must learn from its failed gas policy (energymonitor.ai)

### Climate change won't wait for future innovation — we need action now

28 February <u>Climate change won't wait for future innovation — we need action now (nature.com)</u> doi: https://doi.org/10.1038/d41586-022-00560-2

### Countries agree to end plastic pollution in ambitious global treaty

2 March Plastic pollution: Ambitious global treaty agreed in Nairobi | New Scientist

# New Technology for Storing Summer Heat To Use in Winter 3 March

New Technology for Storing Summer Heat To Use in Winter (scitechdaily.com)

### **Containing Methane Emissions**

16 August 2021 Containing Methane Emissions - Milken Institute Review (milkenreview.org)

### New study reveals small-scale renewable energy sources could cause power failures 2 March

<u>News - New study reveals small-scale renewable energy sources could cause power failures - University of Nottingham</u>

### If Buildings Renovation fails, the EU ETS pricing mechanism must change

3 March If Buildings Renovation fails, the EU ETS pricing mechanism must change - Energy Post

### Nuclear Disaster Vs. Green Hydrogen & Renewal Energy: Compare And Contrast 5 March

### Nuclear Disaster Vs. Green Hydrogen: Compare And Contrast (cleantechnica.com) and NUCLEAR VS RENEWABLES: WHAT'S BETTER FOR CLIMATE MITIGATION?

7 October 2020

Nuclear vs renewables: what's better for climate mitigation? - STEPS Centre (steps-centre.org)

### Government backs Trinity research projects on wind farms, transport alternatives

7 March Government backs Trinity research projects on wind farms, transport alternatives - TechCentral.ie

### **Research Team Advances Biological Alternative to Producing Common Petrochemical – CleanTechnica**

6 March <a href="https://cleantechnica.com/2022/03/05/research-team-advances-biological-alternative-to-producing-common-petrochemical">https://cleantechnica.com/2022/03/05/research-team-advances-biological-alternative-to-producing-common-petrochemical</a>

# Hybridizing PV, redox flow batteries and geothermal heat pumps – pv magazine International

7 March

https://www.pv-magazine.com/2022/03/07/hybridizing-pv-redox-flow-batteries-and-geothermal-heat-pumps

### Wind energy supplied 53% of electricity demand

7 March https://www.rte.ie/news/business/2022/0307/1284851-wind-energy-ireland

### **Radical Plan to Make Earth's Deepest Hole Could Unleash Limitless Energy**

9 March 2022 Radical Plan to Make Earth's Deepest Hole Could Unleash Limitless Energy (sciencealert.com)

### Humanity Just Produced The Biggest Increase in Global CO2 Emissions Ever Recorded

9 March Humanity Just Produced The Biggest Increase in Global CO2 Emissions Ever Recorded (sciencealert.com)

### 'Bloody hard – but possible': EU plots renewables and green hydrogen dash from Russian gas | Recharge

8 March

'Bloody hard – but possible': EU plots renewables and green hydrogen dash from Russian gas | Recharge (rechargenews.com)

### Relocation of agricultural land could greatly reduce carbon emissions

10 March Relocation of agricultural land could greatly reduce carbon emissions (innovationnewsnetwork.com)

#### **Farmland Relocation Could Turn Back the Carbon Emissions Clock** 11 March

Farmland Relocation Could Turn Back the Carbon Emissions Clock | Technology Networks doi:10.1038/s43247-022-00360-6 Nature original paper

### **Community Biomass: for energy independence, stable prices and local control** 11 March

Community Biomass: for energy independence, stable prices and local control - Energy Post and

### Kelp won't help: why seaweed may not be a silver bullet for carbon storage after all 11 March

https://theconversation.com/kelp-wont-help-why-seaweed-may-not-be-a-silver-bullet-for-carbon-storage-after-all-178018

# U.S. Climate Envoy John Kerry Visits NASA Ames to Discuss Climate and Innovation

13 March

U.S. Climate Envoy John Kerry Visits NASA Ames to Discuss Climate and Innovation (scitechdaily.com)

# Military Action in Radioactive Chernobyl Could Be Very Dangerous – For Both People and the Environment

13 March

<u>Military Action in Radioactive Chernobyl Could Be Very Dangerous – For Both People and the Environment</u> (scitechdaily.com)

### The US EPA May Extend the Use of Pesticides that Paralyze Bees | WIRED

12 March The EPA May Extend the Use of Pesticides that Paralyze Bees | WIRED

### How to store renewable energy

15 March How to store renewable energy | Live Science

### Empowering women is essential for an improved climate response

15 March Empowering women is essential for an improved climate response (innovationnewsnetwork.com)

### Scientists show large impact of controlling humidity on greenhouse gas emissions

15 March <u>https://phys.org/news/2022-03-scientists-large-impact-humidity-greenhouse.html</u> DOI: 10.1016/j.joule.2022.02.013

### Could super-sized heat pumps make gas boilers extinct? - BBC News

18 March https://www.bbc.com/news/science-environment-60772187

### What is Energy Security? And what it isn't

17 March What is Energy Security? And what it isn't - Energy Post

### Biomethane for decarbonising transport: the Swedish example

14 March Biomethane for decarbonising transport: the Swedish example - Energy Post

### Novel fidaxomicin antibiotics through site-selective catalysis

10 May 2021 Novel fidaxomicin antibiotics through site-selective catalysis | Communications Chemistry (nature.com) DOI https://doi.org/10.1038/s42004-021-00501-6

# Temporary nature-based carbon removal can lower peak warming in a well-below 2 °C scenario | Communications Earth & Environment

17 March https://www.nature.com/articles/s43247-022-00391-z DOI https://doi.org/10.1038/s43247-022-00391-z

### Study shows widespread physical and genomic adaptation to environment can occur

within weeks (Evolution drives adaption to climate change?) 17 March https://phys.org/news/2022-03-widespread-physical-genomic-environment-weeks.html DOI: 10.1126/science.abj7484

#### Whose Gas Will Europe Import Now? The Choice Matters 18 March

# Concentrating solar power with heat storage could compete with batteries – pv magazine International

18 March

 $\underline{https://www.pv-magazine.com/2022/03/18/concentrating-solar-power-with-heat-storage-could-compete-with-batteries} and$ 

#### The role of concentrated solar power with thermal energy storage in least-cost highly reliable electricity systems fully powered by variable renewable energy

The role of concentrated solar power with thermal energy storage in least-cost highly reliable electricity systems fully powered by variable renewable energy - ScienceDirect https://doi.org/10.1016/j.adapen.2022.100091

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### In a rush to replace Russian gas, the EU has damaged its own climate change strategy 18 arch

In a rush to replace Russian gas, the EU has damaged its own climate change strategy (theconversation.com)

### The enduring threat to the Arctic from Big Oil

21 March The enduring threat to the Arctic from Big Oil (energymonitor.ai)

# Here comes the 21st century's first big investment wave. Is your capital strategy ready?

18 March Here comes the 21st century's first big investment wave. Is your capital strategy ready? | McKinsey

### Planning regime for offshore wind farms is announced

21 March Planning regime for offshore wind farms is announced (rte.ie)

# Concrete fuels climate change – but there's a nature-friendly way to defend coasts from rising seas

22 March Concrete fuels climate change – but there's a nature-friendly way to defend coasts from rising seas (theconversation.com)

### Offshore wind plan can be 'Ardnacrusha x 100' for Ireland

21 March https://www.irishexaminer.com/news/arid-40833458.html

# **Relocating Farmland Could Increase Biodiversity and Turn Back Clock 20 Years on Carbon Emissions**

21 March Relocating Farmland Could Increase Biodiversity and Turn Back Clock 20 Years on Carbon Emissions (scitechdaily.com) DOI: 10.1038/s43247-022-00360-6

#### Methane-Eating Bacteria Convert Potent Greenhouse Gas Into Usable Fuel 22 March Methane-Eating Bacteria Convert Potent Greenhouse Gas Into Usable Fuel (scitechdaily.com)

### Reality check: what the path to a 1.5C world looks like

22 March <u>https://phys.org/news/2022-03-reality-path-15c-world.html</u>

### Cement and steel — nine steps to net zero

23 March <u>Cement and steel — nine steps to net zero (nature.com)</u> doi: https://doi.org/10.1038/d41586-022-00758-4

### Stop blaming the climate for disasters

10 January 2022 <u>Stop blaming the climate for disasters | Communications Earth & Environment (nature.com)</u> DOI https://doi.org/10.1038/s43247-021-00332-2

### Forward Thinking on sustainable and inclusive growth with Ron O'Hanley

23 March Forward Thinking on sustainable and inclusive growth with Ron O'Hanley | McKinsey

### Mainstream Renewable Power announces €575m investment

24 March <u>https://www.irishtimes.com/business/energy-and-resources/mainstream-renewable-power-announces-575m-investment-1.4835050</u>

### This Axial-Flux Motor With a PCB Stator Is Ripe for an Electrified World

26 March https://spectrum.ieee.org/axial-flux

### Hyundai Sonata hybrid is equipped with a solar roof – pv magazine International

25 March https://www.pv-magazine.com/2022/03/25/hyundai-sonata-hybrid-is-equipped-with-a-solar-roof

### Taking the first steps toward net-zero emissions

24 March Taking the first steps toward net-zero emissions | McKinsey

### The net-zero transition: What it would cost, what it could bring (Active links to access

report on sign up) ? March <u>The net-zero transition: Its cost and benefits | Sustainability | McKinsey & Company</u>

# Team achieves 30-fold enhancement of thermoelectric performance in polycrystalline tin selenide

28 March

Team achieves 30-fold enhancement of thermoelectric performance in polycrystalline tin selenide (phys.org) DOI: 10.1002/advs.202105958

# Temporary nature-based carbon removal can lower peak warming in a well-below 2 °C scenario

17 March

Temporary nature-based carbon removal can lower peak warming in a well-below 2 °C scenario | Communications Earth & Environment

# Microbes contribute to setting the ocean carbon flux by altering the fate of sinking particulates | Nature Communications

29 March <u>Microbes contribute to setting the ocean carbon flux by altering the fate of sinking particulates | Nature</u> <u>Communications</u> DOI https://doi.org/10.1038/s41467-022-29297-2

### The race to upcycle CO2 into fuels, concrete and more

29 March <u>The race to upcycle CO2 into fuels, concrete and more (nature.com)</u> doi: https://doi.org/10.1038/d41586-022-00807-y

# 'Between 25-35GW of long-duration energy storage will be installed globally by 2025': report

23 November 2021 'Between 25-35GW of long-duration energy storage will be installed globally by 2025': report | Recharge (rechargenews.com)

### Europe has a unique chance to phase out SF6 – the world's strongest polluter

29 March The EU has a chance to phase out SF6 - the world's strongest polluter (energymonitor.ai)

### **Opinion: EU leaders need to be ready to rethink electricity market design**

28 March Opinion: EU leaders need to be ready to rethink electricity market design (energymonitor.ai)

### Biogas made from farm waste could replace Russian fossil fuels in Germany |

#### Euronews

30 March Biogas made from farm waste could replace Russian fossil fuels in Germany | Euronews

### Concrete made with old tires proves itself in real-world setting

30 March Concrete made with old tires proves itself in real-world setting (newatlas.com)

### A Wave of Startups Is Tackling Cow Burps and Other Climate Issues | WIRED

31 March A Wave of Startups Is Tackling Cow Burps and Other Climate Issues | WIRED

# Switzerland's SpringStation Is A Sustainable Electricity Power Plant Run By You | aBlogtoWatch

1 April Switzerland's SpringStation Is A Sustainable Electricity Power Plant Run By You | aBlogtoWatch

### 2021 Top 25 Earth, Environmental, and Planetary Sciences Articles

29 March

2021 Top 25 Earth, Environmental, and Planetary Sciences Articles (nature.com)

#### **New polymer membrane tech improves efficiency of carbon dioxide capture** 1 April New polymer membrane tech improves efficiency of carbon dioxide capture (phys.org)

DOI: 10.1126/science.abj9351

#### Irish emissions from power-generation and industrial companies rose by 15% in 2021 3April

https://www.irishtimes.com/news/environment/irish-emissions-from-power-generation-and-industrial-companiesrose-by-15-in-2021-1.4843377

### Tropical forests have big climate benefits beyond carbon storage

1 April <u>Tropical forests have big climate benefits beyond carbon storage (nature.com)</u> doi: https://doi.org/10.1038/d41586-022-00934-6

**IPCC's starkest message yet: extreme steps needed to avert climate disaster** 5 April <u>IPCC's starkest message yet: extreme steps needed to avert climate disaster (nature.com)</u> doi: https://doi.org/10.1038/d41586-022-00951-5

### In-depth Q&A: The IPCC's sixth assessment on how to tackle climate change -

Carbon Brief (Large Article) 5 April

In-depth Q&A: The IPCC's sixth assessment on how to tackle climate change - Carbon Brief

#### Climate Change 2022: Mitigation of Climate Change (Very large report with links) April

Climate Change 2022: Mitigation of Climate Change (ipcc.ch)

### How researchers can help fight climate change in 2022 and beyond

5 April

How researchers can help fight climate change in 2022 and beyond (nature.com) doi: https://doi.org/10.1038/d41586-021-03817-4

# IPCC finds the world has its best chance yet to slash emissions – if it seizes the opportunity

4 April

IPCC finds the world has its best chance yet to slash emissions – if it seizes the opportunity (theconversation.com)

# IPCC says the tools to stop catastrophic climate change are in our hands. Here's how to use them

4 April

IPCC says the tools to stop catastrophic climate change are in our hands. Here's how to use them (theconversation.com)

### What the invasion of Ukraine means for the IPCC's latest climate change report

4 April

What the invasion of Ukraine means for the IPCC's latest climate change report (theconversation.com)

### New IPCC Report Shows We Can Still Ensure a 'Livable Future' if We Act Now

IRISH CHEMICAL NEWS ISSUE NO.2 MAY/ JUNE 2022

5 April

https://www.sciencealert.com/new-ipcc-report-shows-we-can-still-save-our-livable-future-if-we-act-now-here-show?utm\_source=ScienceAlert+-+Daily+Email+Updates&utm\_campaign=5862cd2573-MAILCHIMP\_EMAIL\_CAMPAIGN&utm\_medium=email&utm\_term=0\_fe5632fb09-5862cd2573-366021682

### **Climate change: IPCC scientists report five ways to save the planet - BBC News** 5 April

https://www.bbc.com/news/science-environment-60987614

# The evidence is clear: the time for action is now. We can halve emissions by 2030. — IPCC

4 April

https://www.ipcc.ch/2022/04/04/ipcc-ar6-wgiii-pressrelease

### **The EU can simultaneously end dependence on Russia and meet climate goals** 5 April

<u>The EU can simultaneously end dependence on Russia and meet climate goals (nature.com)</u> doi: https://doi.org/10.1038/d41586-022-00920-y

### The path to sustainable and inclusive growth

6 April What is sustainable and inclusive growth? | McKinsey

### **IPCC report: where to begin slashing emissions**

7 April IPCC report: where to begin slashing emissions (theconversation.com)

### How fast can we stop Earth from warming? | Space

29 March https://theconversation.com/how-fast-can-we-stop-earth-from-warming-178295

### Price volatility and greenwashing: do Gas and LNG make economic or climate sense?

- Energy Post

7 April https://energypost.eu/price-volatility-and-greenwashing-do-gas-and-lng-make-economic-or-climate-sense

# Hydrogen 'twice as powerful a greenhouse gas as thought before': UK government study | Recharge

8 April

 $\frac{https://www.rechargenews.com/energy-transition/hydrogen-twice-as-powerful-a-greenhouse-gas-as-thought-before-uk-government-study/2-1-1200115$ 

### It's Time to Ditch Performative Recycling

7 April <u>https://www.treehugger.com/recycled-plastic-bottles-leach-more-chemicals-5225036</u>

# Temporary Nature-Based Carbon Removal Can Help Protect Us From a Warming Planet

11 April

Temporary Nature-Based Carbon Removal Can Help Protect Us From a Warming Planet (scitechdaily.com) DOI: 10.1038/s43247-022-00391-z

# **Deforestation Impacts Go Far Beyond Carbon: Range of Biophysical Factors Are Changed**

11 April

Deforestation Impacts Go Far Beyond Carbon: Range of Biophysical Factors Are Changed (scitechdaily.com) DOI: 10.3389/ffgc.2022.756115

### We commercialized a methane capture technology in ten years — here's how 12 April

We commercialized a methane capture technology in ten years — here's how (nature.com) doi: https://doi.org/10.1038/d41586-022-00999-3

### **Importing Canadian Energy To Drastically Reduce Carbon Emissions**

12 April Importing Canadian Energy To Drastically Reduce Carbon Emissions (scitechdaily.com) DOI: 10.1016/j.enpol.2021.112369

# Climate Change Will Reshuffle Marine Ecosystems in Unexpected Ways – "Like Putting Marine Biodiversity in a Blender"

12 April Climate Change Will Reshuffle Marine Ecosystems in Unexpected Ways – "Like Putting Marine Biodiversity in a Blender" (scitechdaily.com) DOI: 10.1098/rspb.2021.2755

### Aviation policy alert: non-CO2 emissions have up to four times the climate impact 14 April

Aviation policy alert: non-CO2 emissions have up to four times the climate impact - Energy Post

# World's biggest Carbon Capture project: Shute Creek's "sell or vent" business model isn't working

11 April

<u>World's biggest Carbon Capture project: Shute Creek's "sell or vent" business model isn't working - Energy Post</u> Fossil Fuel divestment is premature: instead, enable investment to keep prices low, and tax consumption

12 April

Fossil Fuel divestment is premature: instead, enable investment to keep prices low, and tax consumption - Energy Post

### Pumped hydro resurfaces as a net-zero stalwart

11 April Pumped hydro resurfaces as a net zero stalwart (energymonitor.ai)

### Europe's rush for energy security through LNG risks fossil fuel lock-in

12 April Europe's rush for energy security through LNG risks fossil fuel lock-in (energymonitor.ai)

#### **'Thermal batteries' could efficiently store wind and solar power in a renewable grid** 13 April

<u>'Thermal batteries' could efficiently store wind and solar power in a renewable grid | Science | AAAS</u> doi: 10.1126/science.abq5215

### These Microbes Breathe Methane And Turn It Into Electricity in a Weird Living Battery

16 April

These Microbes Breathe Methane And Turn It Into Electricity in a Weird Living Battery (sciencealert.com)

# Ozone May Be Weakening One of the Earth's Most Important Cooling Mechanisms – Heating the Planet More Than We Realize

18 April DOI: 10.1038/s41558-022-01320-w

### IPCC's starkest message yet: extreme steps needed to avert climate disaster

5 April <u>IPCC's starkest message yet: extreme steps needed to avert climate disaster (nature.com)</u> doi: https://doi.org/10.1038/d41586-022-00951-5

### Delivering the climate technologies needed for net zero

April 18 Delivering climate technologies for net zero | McKinsey

### Outsprinting the energy crisis

21 April How European industry can respond to spiking energy prices | McKinsey

### How electric vehicles will shape the future and other articles

23 April How electric vehicles will shape the future | McKinsey & Company

### Reimagining engineering and project development to meet net-zero targets

6 April Voices on Infrastructure: Voices on Infrastructure: Reimagining engineering and project development to meet netzero targets | Operations | McKinsey & Company

### Plans for €350m offshore energy hub in Rosslare

22 April Plans for €350m offshore energy hub in Rosslare (rte.ie)

### Lower-level ozone could be causing increased ocean warming

22 April Lower-level ozone could be causing increased ocean warming (innovationnewsnetwork.com)

### Offshore wind energy capacity additions in Europe to break records in 2022

22 April Offshore wind energy capacity additions in Europe to break records in 2022 (innovationnewsnetwork.com)

# Tests of rubber granules used as artificial turf for football fields in terms of toxicity to human health and the environment

23 April <u>Tests of rubber granules used as artificial turf for football fields in terms of toxicity to human health and the</u> <u>environment | Scientific Reports (nature.com)</u> DOI https://doi.org/10.1038/s41598-022-10691-1

### **Global Energy Perspective 2022** (Flagship Report)

26 April Global Energy Perspective 2022 | McKinsey

# New method for long-term prediction of renewables generation in Europe – pv magazine International

25 April New method for long-term prediction of renewables generation in Europe – pv magazine International (pvmagazine.com)

### Global warming now pushing heat into territory humans cannot tolerate

20 May 2020 Global warming now pushing heat into territory humans cannot tolerate (theconversation.com)

### **Brilliant Planet plans cheap, gigaton-scale carbon capture using algae** 26 April

Brilliant Planet plans cheap, gigaton-scale carbon capture using algae (newatlas.com) https://newatlas.com/environment/brilliant-planet-algae-carbon-sequestration

### Net-zero steel in building and construction: The way forward

28 April Net-zero steel in building and construction: The way forward | McKinsey

# Brimstone to Produce the World's First Carbon-Negative Portland Cement | Business Wire

28 April https://www.businesswire.com/news/home/20220428005472/en/Brimstone-to-Produce-the-World%E2%80%99s-First-Carbon-Negative-Portland-Cement

### **Sea Levels Are Creeping Up, But Some Beaches Are Getting Bigger. Here's Why** 3 May

Sea Levels Are Creeping Up, But Some Beaches Are Getting Bigger. Here's Why (sciencealert.com)

# Fonterra says feeding cows seaweed could curb methane emissions - Farming Independent

2 May

https://www.independent.ie/business/farming/dairy/fonterra-says-feeding-cows-seaweed-could-curb-methaneemissions-41606518.html

### Ozone-destroying chemical is on the rise despite crackdown | Science | AAAS

2 May

Ozone-destroying chemical is on the rise despite crackdown | Science | AAAS

### Construction is underway on the world's largest offshore wind farm

3 May Construction is underway on the world's largest offshore wind farm (innovationnewsnetwork.com)

#### **"Microbial Protein" – Fungi-Based Meat Alternatives Can Help Save Earth's Forests** 4 May

"Microbial Protein" – Fungi-Based Meat Alternatives Can Help Save Earth's Forests (scitechdaily.com) DOI: 10.1038/s41586-022-04629-w

# 'Europe is never going to be capable of producing its own hydrogen in sufficient quantities': EU climate chief

4 May

'Europe is never going to be capable of producing its own hydrogen in sufficient quantities': EU climate chief | Recharge (rechargenews.com)

### Climate simulations: recognize the 'hot model' problem

4 May <u>Climate simulations: recognize the 'hot model' problem (nature.com)</u> doi: https://doi.org/10.1038/d41586-022-01192-2

# Hydrogen blending in gas grid would lead to 'limited CO2 benefits and a large increase in energy costs': Irena | Recharge

5 May Hydrogen blending in gas grid would lead to 'limited CO2 benefits and a large increase in energy costs': Irena | Recharge (rechargenews.com)

# Use of 'too hot' climate models exaggerates impacts of global warming | Science | AAAS

4 May

https://www.science.org/content/article/use-too-hot-climate-models-exaggerates-impacts-global-warming doi: 10.1126/science.abq8448

### Mapped: Solar and Wind Power by Country

4 May https://elements.visualcapitalist.com/mapped-solar-and-wind-power-by-country

# Plastic-Eating Enzyme Could Supercharge Recycling and Eliminate Billions of Tons of Landfill Waste

8 May Plastic-Eating Enzyme Could Supercharge Recycling and Eliminate Billions of Tons of Landfill Waste (scitechdaily.com) DOI: 10.1038/s41586-022-04599-z

### The birth of the carbon removal market

6 May The birth of the carbon removal market (energymonitor.ai)

### A common sunscreen ingredient turns toxic in the sea — anemones suggest why 6 May

<u>A common sunscreen ingredient turns toxic in the sea — anemones suggest why (nature.com)</u> doi: https://doi.org/10.1038/d41586-022-01271-4

#### **CCUS: Where is carbon capture working? – Energy Monitor** 28 April

https://www.energymonitor.ai/tech/carbon-removal/carbon-capture-where-is-it-working

### 'Fifty-fifty chance' temperatures will hit 1.5C

10 May 'Fifty-fifty chance' temperatures will hit 1.5C (rte.ie)

### Ireland has strongest April on record for generating wind energy

9 May https://www.thejournal.ie/april-wind-record-energy-5758978-May2022

# The effect of reducing per capita water and energy uses on renewable water resources in the water, food and energy nexus | Scientific Reports

9 May https://www.nature.com/articles/s41598-022-11595-w DOI https://doi.org/10.1038/s41598-022-11595-w

# EU plans 'massive' roll-out of Carbon Contracts for Difference subsidies for green hydrogen

11 May

EU plans 'massive' roll-out of Carbon Contracts for Difference subsidies for green hydrogen | Recharge (rechargenews.com)

### Energy islands: Pie in the sky or key to net zero?

10 May Energy islands: Pie in the sky or key to net zero? - Energy Monitor

#### **Better Understanding of Banana Browning Could Reduce Food Waste** 12 May

Better Understanding of Banana Browning Could Reduce Food Waste | Technology Networks doi:10.1088/1478-3975/ac664d

### Climate change: put water at the heart of solutions

10 May <u>Climate change: put water at the heart of solutions (nature.com)</u> doi: https://doi.org/10.1038/d41586-022-01273-2

### Decarbonizing the world's industries: A net-zero guide for nine key sectors

13 May Decarbonizing the world's industries: A net-zero guide for nine key sectors | Sustainability | McKinsey & Company

# $Offshore\ wind\ to\ methanol\ |\ Engie\ and\ partners\ to\ combine\ 1.85GW\ of\ green\ hydrogen\ with\ captured\ CO2\ |\ Recharge$

10 May

Offshore wind to methanol | Engie and partners to combine 1.85GW of green hydrogen with captured CO2 | Recharge (rechargenews.com)

### Surge in renewables capacity could reduce EU's dependence on Russian gas

11 May Surge in renewables capacity could reduce EU's dependence on Russian gas (irishtimes.com)

# Seven ways for the U.S. and Europe to enhance energy security and advance climate goals

9 May

Seven ways for the U.S. and Europe to enhance energy security and advance climate goals - Energy Post

# **Record Renewables additions for 2021 and 2022 despite supply bottlenecks prove Solar & Wind's resilience**

13 May

Record Renewables additions for 2021 and 2022 despite supply bottlenecks prove Solar & Wind's resilience -Energy Post

### Record number of polluters set CO2 emissions targets - BBC News

12 May Record number of polluters set CO2 emissions targets - BBC News

### **Decarbonizing the grid with 24/7 clean power purchase agreements | McKinsey** 11 May

https://www.mckinsey.com/industries/electric-power-and-natural-gas/our-insights/decarbonizing-the-grid-with-24-7-clean-power-purchase-agreements?cid=other-eml-alt-mip-mck&hdpid=75c51710-1680-46dc-9823cd8042ac7389&hctky=9170817&hlkid=82260ab063a94df58171a9687515a424

### World's first net-zero transatlantic flight set to take place next year | Politics News | Sky News

14 May 2022

World's first net-zero transatlantic flight set to take place next year | Politics News | Sky News

### 4,100 Feet Underground, Scientists Test a Unique Geothermal Energy System

12 May https://scitechdaily.com/4100-feet-underground-scientists-test-a-unique-geothermal-energy-system

### Video: Farm sequestering €37,000 worth of carbon/year - Agriland.ie

15 May

https://www.agriland.ie/farming-news/video-farm-sequestering-e37000-worth-of-carbon-year

### About us - learn more about NNE (Pharma Training)

https://www.nne.com/about-us

### Blue carbon: The potential of coastal and oceanic climate action

13 May Blue carbon: The potential of coastal and oceanic climate action | McKinsey

# Cutting Air Pollution Emissions Would Save 50,000 U.S. Lives and \$600 Billion Each Year

16 May

Cutting Air Pollution Emissions Would Save 50,000 U.S. Lives and \$600 Billion Each Year (scitechdaily.com) DOI: 10.1029/2022GH000603

### Can gravity batteries solve our energy storage problems? - BBC Future

17 May https://www.bbc.com/future/article/20220511-can-gravity-batteries-solve-our-energy-storage-problems

### 'Scalability is wind power's strength but also its Achilles heel – we need a fresh take' | Recharge

16 May

 $\underline{https://www.rechargenews.com/wind/scalability-is-wind-powers-strength-but-also-its-achilles-heel-we-need-a-fresh-take/2-1-1219579$ 

# Guest post: How 12 key industries can cut emissions in line with 1.5C - Carbon Brief $^{16\,\mathrm{May}}$

 $\underline{https://www.carbonbrief.org/guest-post-how-12-key-industries-can-cut-emissions-in-line-with-1-5c}$ 

# Existing oil, gas and coal extraction sites need to be closed down to stay within 1.5 C, findings show

17 May https://phys.org/news/2022-05-oil-gas-coal-sites.html DOI: 10.1088/1748-9326/ac6228

### Global CO2 concentration in atmosphere hit new high on May 2nd week: Report

18 May Global CO2 concentration in atmosphere hit new high in May 2nd week: Report (downtoearth.org.in)

### **Climate change could expand forests. But will they cool the planet?** | **Science** | **AAAS** 19 May

Climate change could expand forests. But will they cool the planet? | Science | AAAS

### Biden administration lays out plan for four carbon-capture facilities | Ars Technica

21 May Biden administration lays out plan for four carbon-capture facilities | Ars Technica

# This Concept Ship Uses Two Smaller Boats to Turn Plastic Into "Beyond Green" Hydrogen – autoevolution

20 May This Concept Ship Uses Two Smaller Boats to Turn Plastic Into "Beyond Green" Hydrogen - autoevolution

### "Greener than green": Waste-to-hydrogen ship could collect plastic from the ocean -Industry Europe

20 May

 $\underline{https://industryeurope.com/sectors/chemicals-biochemicals/this-ship-will-collect-plastic-waste-directly-from-the-ocean}$ 

### Energy Monitor: Opinion: REPowerEU cannot decide if it is a climate or fossil plan

20 May

Opinion: REPowerEU can't decide if it's a climate or fossil plan (energymonitor.ai)

# The net-zero transition in the wake of the war in Ukraine: A detour, a derailment, or a different path?

19 May The net-zero transition in the wake of the war in Ukraine: A detour, a derailment, or a different path? | McKinsey

# Plastic pollution: European farmland could be largest global reservoir of microplastics

23 May

Plastic pollution: European farmland could be largest global reservoir of microplastics (theconversation.com)

#### **Improving biodiversity protection through artificial intelligence** 24 March

Improving biodiversity protection through artificial intelligence | Nature Sustainability DOI https://doi.org/10.1038/s41893-022-00851-6

### Combatting carbon emissions: Is carbon capture the answer?

12 May Combatting carbon emissions: Is carbon capture the answer? | CAS

# **Carbon capture takes sponge-like form with new cost-effective method** 23 May

Carbon capture takes sponge-like form with new cost-effective method (phys.org) DOI: 10.1002/anie.202206718

# BECCS: the carbon capture technology the UK is relying on to reach net zero $17\ \mathrm{May}$

 $\underline{https://the conversation.com/beccs-the-carbon-capture-technology-the-uk-is-relying-on-to-reach-net-zero-182176}$ 

# Mitigating climate disruption in time: A self-consistent approach for avoiding both near-term and long-term global warming | PNAS

23 May https://www.pnas.org/doi/10.1073/pnas.2123536119 https://doi.org/10.1073/pnas.2123536119

# Experts Forecast Wind Power Plant of the Future — Taller, Cheaper – CleanTechnica

24 May Experts Forecast Wind Power Plant of the Future — Taller, Cheaper - CleanTechnica

### **Practical Power Beaming Gets Real**

21 May Practical Power Beaming Gets Real - IEEE Spectrum

### Is Carbon Management the Key to Reaching Net Zero?

23 May Is Carbon Management the Key to Reaching Net Zero? (powermag.com)

# Slashing Pollutants Other Than CO2 Just as Important To Give Earth a Chance | Technology Networks

25 May

<u>Slashing Pollutants Other Than CO2 Just as Important To Give Earth a Chance | Technology Networks</u> doi:<u>10.1073/pnas.2123536119</u>

### **Biologically produced Ethylene for plastics can become a carbon capture leader** 25 May

Biologically produced Ethylene for plastics can become a carbon capture leader - Energy Post

### New Study Says World Must Cut Short-Lived Climate Pollutants as Well as Carbon Dioxide to Meet Paris Agreement Goals - Inside Climate News <sup>23 May</sup>

New Study Says World Must Cut Short-Lived Climate Pollutants as Well as Carbon Dioxide to Meet Paris Agreement Goals - Inside Climate News

### **Spotlight on Davos: Driving industry transformation** (With active links to topics) 26 May

Spotlight on Davos: Driving industry transformation | McKinsey & Company

### Metal-lifespan analysis shows scale of waste

26 May <u>Metal-lifespan analysis shows scale of waste (nature.com)</u> doi: https://doi.org/10.1038/d41586-022-01467-8

### UL team develops way to capture cancer-causing toxin (Prof Michael Zaworotko)

27 May https://www.rte.ie/news/munster/2022/0527/1301609-scientists-limerick

#### Australian startup develops mine shaft gravity storage – pv magazine International 25 May

Australian startup develops mine shaft gravity storage - pv magazine International (pv-magazine.com)

# The 'carbon footprint' was co-opted by fossil fuel companies to shift climate blame – here's how it can serve us again

27 May

The 'carbon footprint' was co-opted by fossil fuel companies to shift climate blame – here's how it can serve us again (theconversation.com)

### World's fastest carbon capture system claims 99% efficiency in ambient air

29 May https://newatlas.com/environment/worlds-fastest-carbon-capture-system

### Analysis: China's CO2 emissions see longest sustained drop in a decade - Carbon Brief

30 May

Analysis: China's CO2 emissions see longest sustained drop in a decade - Carbon Brief

### **Underwater Drone Measures Ocean Carbon Levels**

30 May https://learningenglish.voanews.com/a/underwater-drone-measures-ocean-carbon-levels/6591253.html

### Fjords may emit as much methane as all the deep oceans globally

27 May Fjords may emit as much methane as all the deep oceans globally (phys.org) DOI: 10.1002/lol2.10259

### China's first salt cavern for compressed air energy storage goes online – pv magazine International

30 May <u>https://www.pv-magazine.com/2022/05/30/chinas-first-salt-cavern-for-compressed-air-energy-storage-comes-online</u>

### Planning permission granted for Arklow Bank Wind Park

30 May

Why hydrogen is not the answer to petrostates' woes 27 May Why hydrogen is not the answer to petrostates' woes (energymonitor.ai)

### Maersk: turning around an emissions super-tanker

27 May A net-zero Maersk: turning around an emissions super-tanker (energymonitor.ai)

# Converting From Fuel Oil To Heat Pumps Would Save The US 47% Of The Oil We Used To Import From Russia – CleanTechnica

31 May

Converting From Fuel Oil To Heat Pumps Would Save The US 47% Of The Oil We Used To Import From Russia -CleanTechnica
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O Agilent Technologies, Inc. 2018



IRISH CHEMICAL NEWS ISSUE NO.2 MAY/ JUNE 2022

### **Rechargeable Batteries & Technology**

#### **Battery-electric ''Infinity Train'' will charge itself using gravity** 1 March

Battery-electric "Infinity Train" will charge itself using gravity (newatlas.com)

### 'The cheapest way to ship green hydrogen is via e-methane — we will help wean Germany off Russian gas'

2 March <u>'The cheapest way to ship green hydrogen is via e-methane — we will help wean Germany off Russian gas'</u> <u>Recharge (rechargenews.com)</u>

#### Battery power: the hunt for stable renewable energy storage | Euronews

1 March Battery power: the hunt for stable renewable energy storage | Euronews

### **Clues to Better Batteries Emerge from Tracking Lithium | BNL Newsroom**

28 February Clues to Better Batteries Emerge from Tracking Lithium | BNL Newsroom

#### New Electrolyte Could Advance All Solid-State Batteries

4 March https://www.azonano.com/news.aspx?newsID=38782

#### Industrial salt makes a safer and more sustainable zinc battery

13 February <u>Industrial salt makes a safer and more sustainable zinc battery – Physics World</u> and DOI https://doi.org/10.1038/s41893-021-00800-9

### Australian researchers announce lithium-sulfur battery breakthrough – pv magazine International

7 March <a href="https://www.pv-magazine.com/2022/03/07/australian-researchers-announce-lithium-sulfur-battery-breakthrough">https://www.pv-magazine.com/2022/03/07/australian-researchers-announce-lithium-sulfur-battery-breakthrough</a>

#### Toward Solid-State Lithium-Ion Batteries That Pack Twice As Much Energy per Pound

8 March

Toward Solid-State Lithium-Ion Batteries That Pack Twice As Much Energy per Pound (scitechdaily.com) DOI: 10.1002/aenm.202102741

#### Are solid-state batteries safer than lithium-ion?

8 March Are solid-state batteries safer than lithium-ion? (cosmosmagazine.com)

### Electrochemical cell recharging by solvent separation and transfer processes | Scientific Reports

8 March

Electrochemical cell recharging by solvent separation and transfer processes | Scientific Reports (nature.com) DOI https://doi.org/10.1038/s41598-022-07573-x

### New, New Solid-State Battery News From MIT

9 March https://cleantechnica.com/2022/03/09/new-new-solid-state-battery-news-from-mit

### New Supercapacitor Outperforms Structural Energy Storage Devices

9 March https://www.azonano.com/news.aspx?newsID=38800 and https://www.sciencedirect.com/science/article/pii/S2542529322000529

#### When will long duration battery energy storage take off?

7 March https://www.energy-storage.news/when-will-long-duration-battery-energy-storage-take-off

#### Lithium developments: The past, present, and future

10 March Lithium developments: The past, present, and future (innovationnewsnetwork.com)

#### International Battery Metals: Exploring the evolution of lithium production (contains a link to ebook (12 pages))

International Battery Metals: Exploring the evolution of lithium production (innovationnewsnetwork.com)

#### Key technology trends in battery storage 2022-2030: Sungrow Q&A - Energy Storage News

10 March

Key technology trends in battery storage 2022-2030: Sungrow Q&A - Energy Storage News (energy-storage.news)

### Senec remotely switches off its residential batteries after explosion in Germany – pv

magazine International (Fire hazard of Li ion batteries)

10 March

https://www.pv-magazine.com/2022/03/10/senec-remotely-switches-off-its-residential-batteries-after-explosion-ingermany

### New Material Could Make Lithium-Ion Batteries Last Years Longer – ExtremeTech

9 March https://www.extremetech.com/mobile/332534-new-material-could-make-lithium-ion-batteries-last-years-longer

### Toward Solid-State Lithium-Ion Batteries That Pack Twice As Much Energy per Pound

8 March

https://scitechdaily.com/toward-solid-state-lithium-ion-batteries-that-pack-twice-as-much-energy-per-pound DOI: 10.1002/aenm.202102741

#### **Everything you need to know about metal-air batteries** | **Popular Science**

12 March Everything you need to know about metal-air batteries | Popular Science (popsci.com)

### **Poly(ethylene oxide)-Based Electrolytes for Solid-State Potassium Metal Batteries** with a Prussian Blue Positive Electrode

14 March

Poly(ethylene oxide)-Based Electrolytes for Solid-State Potassium Metal Batteries with a Prussian Blue Positive Electrode | ACS Applied Polymer Materials https://doi.org/10.1021/acsapm.2c00014

### High-energy and low-cost membrane-free chlorine flow battery | Nature Communications

11 March https://www.nature.com/articles/s41467-022-28880-x DOI https://doi.org/10.1038/s41467-022-28880-x

### Two-dimensional biphenylene: a promising anchoring material for lithium-sulfur batteries | Scientific Reports

17 March <u>Two-dimensional biphenylene: a promising anchoring material for lithium-sulfur batteries | Scientific Reports</u> (nature.com) DOI https://doi.org/10.1038/s41598-022-08478-5

### Iron electrolyte flow battery player ESS Inc expands into Europe - Energy Storage News

17 March

https://www.energy-storage.news/iron-electrolyte-flow-battery-player-ess-inc-expands-into-europe

#### Symmetrical flow battery may strike right balance for grid-scale storage

16 March <a href="https://newatlas.com/energy/symmetrical-flow-battery-grid-scale-storage">https://newatlas.com/energy/symmetrical-flow-battery-grid-scale-storage</a>

### Transient quantum beatings of trions in hybrid organic tri-iodine perovskite single crystal | Nature Communications

17 March https://www.nature.com/articles/s41467-022-29053-6 DOI https://doi.org/10.1038/s41467-022-29053-6

#### A Unified Theory of Electrochemical Energy Storage: Bridging Batteries and Supercapacitors

17 March <u>A Unified Theory of Electrochemical Energy Storage: Bridging Batteries and Supercapacitors (drexel.edu)</u> and Continuous transition from double-layer to Faradaic charge storage in confined electrolytes

17 March

Continuous transition from double-layer to Faradaic charge storage in confined electrolytes | Nature Energy DOI: 10.1038/s41560-022-00993-z

#### **Ionic Liquids Make a Splash in Next-Generation Solid-State Lithium Metal Batteries** 19 March

Ionic Liquids Make a Splash in Next-Generation Solid-State Lithium Metal Batteries (scitechdaily.com) DOI: 10.1016/j.isci.2022.103896

# International Lithium Corp. Intersects 10 Metres of Zoned Pegmatite With Up to 40% Spodumene in First Two Holes at Raleigh Lake Lithium and Rubidium Project in Ontario, Canada

### The numbers behind the record-breaking rise of the UK's battery storage market - Energy Storage News

17 March https://www.energy-storage.news/the-numbers-behind-the-record-breaking-rise-of-the-uk-battery-storage-market

#### **New Quantum Technology To Make Charging Electric Cars As Fast as Pumping Gas** 21 March

https://scitechdaily.com/new-quantum-technology-to-make-charging-electric-cars-as-fast-as-pumping-gas

## How a few geothermal plants could solve America's lithium supply crunch and boost the EV battery industry

21 March

 $\underline{https://the conversation.com/how-a-few-geothermal-plants-could-solve-americas-lithium-supply-crunch-and-boost-the-ev-battery-industry-179465}$ 

### FREYR might use half of future production capacity for energy storage

18 March

 $\underline{https://www.energy-storage.news/freyr-could-use-half-of-100gwh-target-capacity-for-storage-eyes-system-integrator-play}$ 

# Australian flow battery maker eyes largest install to date after inking US deal – pv magazine International

22 March

Australian flow battery maker eyes largest install to date after inking US deal – pv magazine International (pvmagazine.com)

### LFP to dominate 3TWh global lithium-ion battery market by 2030

22 March <a href="https://www.energy-storage.news/lfp-to-dominate-3twh-global-lithium-ion-battery-market-by-2030">https://www.energy-storage.news/lfp-to-dominate-3twh-global-lithium-ion-battery-market-by-2030</a>

### Liquid salt greases wheels of high-density lithium metal battery design

20 March https://newatlas.com/energy/salty-liquid-high-density-battery-design

### Above-bandgap light tech to improve performance of lithium-ion batteries, fuel cells – pv magazine International

23 March <u>https://www.pv-magazine.com/2022/03/23/above-bandgap-light-tech-to-improve-performance-of-lithium-ion-batteries-fuel-cells</u>

#### Charting a sustainable course for batteries

23 March <u>Charting a sustainable course for batteries | Nature Sustainability</u> https://doi.org/10.1038/s41893-022-00876-x

### **Charging sustainable batteries**

23 March Charging sustainable batteries | Nature Sustainability

### Latent heat thermophotovoltaic battery for renewables storage – pv magazine International

23 March

https://www.pv-magazine.com/2022/03/23/latent-heat-thermophotovoltaic-battery-for-renewables-storage

### LDES may struggle to compete with lithium-ion as its duration grows

24 Parch

https://www.energy-storage.news/long-duration-energy-storage-may-struggle-to-compete-with-lithium-ion-as-itsduration-grows

### **The weekend read: Sodium-ion batteries go mainstream – pv magazine International** 26 March

<u>The weekend read: Sodium-ion batteries go mainstream – pv magazine International (pv-magazine.com)</u>

### Argonne researchers find cathode material synthesis a key reason for performance degradation of sodium-ion batteries

25 March https://www.greencarcongress.com/2022/03/20220325-argonne.html doi: 10.1038/s41467-022-28052-x

#### New Process to Boost Hybrid Potassium Ion Storage Devices

23 March New Process to Boost Hybrid Potassium Ion Storage Devices (azonano.com)

#### Available Graphene Supercapacitors; How Close are We?

21 March Available Graphene Supercapacitors; How Close are We? (azonano.com)

#### A Review of Graphene in Energy Storage Devices

10 August 2021 <u>A Review of Graphene in Energy Storage Devices (azonano.com)</u>

#### Development of stretchable and printable free-form lithium-ion batteries

25 March https://techxplore.com/news/2022-03-stretchable-printable-free-form-lithium-ion-batteries.html DOI: 10.1021/acsnano.1c08405

### **Re-jigged cathode recipe gives new hope to solid-state batteries for electric vehicles** 25 March

https://phys.org/news/2022-03-re-jigged-cathode-recipe-solid-state-batteries.html DOI: 10.1007/s12274-022-4242-5

#### A Safe, Stable Approach to High Performance Zinc Ion Batteries

24 March A Safe, Stable Approach to High Performance Zinc Ion Batteries (azonano.com)

#### **Pivotal Battery Discovery Could Impact Transportation & the Grid** 26 March

https://cleantechnica.com/2022/03/26/pivotal-battery-discovery-could-impact-transportation-the-grid-overcoming-performance-decline

#### Discovery doubles the lifespan of lithium-ion batteries

29 March <a href="https://cosmosmagazine.com/technology/materials/lithium-ion-batteries-coating-lifespan">https://cosmosmagazine.com/technology/materials/lithium-ion-batteries-coating-lifespan</a>

### Epitaxial growth of an atom-thin layer on a LiNi0.5Mn1.5O4 cathode for stable Liion battery cycling | Nature Communications

23 March https://www.nature.com/articles/s41467-022-28963-9 DOI https://doi.org/10.1038/s41467-022-28963-9

### The mobility rEVolution: Quantum physics-based tech to cut EV charging time to nine seconds – pv magazine International

25 March <u>https://www.pv-magazine.com/2022/03/25/the-mobility-revolution-quantum-physics-based-tech-to-cut-ev-charging-time-to-nine-seconds</u>

#### Nickel Cells Sell More-Affordable Hydrogen Power - IEEE Spectrum

28 March Nickel Cells Sell More-Affordable Hydrogen Power - IEEE Spectrum

### Carbon nanosheets as a competent assistant to manganese dioxide show remarkable performance in supercapacitors

29 March https://phys.org/news/2022-03-carbon-nanosheets-manganese-dioxide-remarkable.html DOI: 10.1007/s11705-021-2065-7

### LFP Battery News - Is The End Of Nickel In Sight? - CleanTechnica

30 March https://cleantechnica.com/2022/03/31/lfp-battery-news-is-the-end-of-nickel-in-sight

#### New Sulfur Battery Promises 300% More EV Range On a Budget

2 April New Sulfur Battery Promises 300% More EV Range On a Budget (cleantechnica.com)

#### "Hibernating" battery for seasonal storage releases energy when heated

4 April

"Hibernating" battery for seasonal storage releases energy when heated (newatlas.com)

#### **X-Ray Images Captured of Electric Vehicle Batteries as They Degrade Over Time** 6 April

X-Ray Images Captured of Electric Vehicle Batteries as They Degrade Over Time | Technology Networks doi:10.1149/1945-7111/ac4b83

### **Novel use of iron-laced carbon nanofibers yields high-performance energy storage** 6 April

Novel use of iron-laced carbon nanofibers yields high-performance energy storage (phys.org) DOI: 10.1007/s12274-022-4266-x

# Highly Stable Potassium-Ion Battery Enabled by Nanoengineering of an Sb Anode | ACS Applied Materials & Interfaces

7 April

Highly Stable Potassium-Ion Battery Enabled by Nanoengineering of an Sb Anode | ACS Applied Materials & Interfaces https://doi.org/10.1021/acsami.1c24251

### Atomic Defect Mediated Li-Ion Diffusion in a Lithium Lanthanum Titanate Solid-State Electrolyte | ACS Nano

11 April https://pubs.acs.org/doi/10.1021/acsnano.2c02250 https://doi.org/10.1021/acsnano.2c02250

### A 4 V-class Metal-free Organic Lithium-ion Battery Gets Closer to Reality

13 April <u>Research News - A 4 V-class Metal-free Organic Lithium-ion Battery Gets Closer to Reality | Tohoku University</u> <u>Global Site</u> DOI: <u>10.1002/advs.202200187</u>

### ESS Inc hits back at EPRI director's 'long-duration lithium' comments

14 April ESS Inc hits back at EPRI director's 'long-duration lithium' comments (energy-storage.news)

## Lithium mining: How new production technologies could fuel the global EV revolution

12 April Lithium mining: How new production technologies could fuel the global EV revolution | McKinsey

### Lithium and cobalt: A tale of two commodities

22 June 2018 Lithium and cobalt: A tale of two commodities | McKinsey

#### **Grid-Scale Storage Solutions - Plastic & Freeze/Thaw Battery Edition – CleanTechnica**

15 April <u>https://cleantechnica.com/2022/04/15/grid-scale-storage-solutions-plastic-freeze-thaw-battery-edition</u>

## Room temperature all-solid-state lithium batteries based on a soluble organic cage ionic conductor | Nature Communications

19 April <u>Room temperature all-solid-state lithium batteries based on a soluble organic cage ionic conductor | Nature</u> <u>Communications</u> DOI https://doi.org/10.1038/s41467-022-29743-1

# Lithium costs a lot of money—so why aren't we recycling lithium batteries? | Ars Technica

19 April <u>https://arstechnica.com/science/2022/04/lithium-costs-a-lot-of-money-so-why-arent-we-recycling-lithium-batteries</u>

### The Renewable-Energy Revolution Will Need Renewable Storage | The New Yorker

IRISH CHEMICAL NEWS ISSUE NO.2 MAY/ JUNE 2022

### Zinc-ion battery for residential applications – pv magazine International

21 April https://www.pv-magazine.com/2022/04/21/zinc-ion-battery-for-residential-applications

### **Environmentally Friendly Method Could Lower Costs to Recycle Lithium-Ion Batteries**

12 November 2020

https://ucsdnews.ucsd.edu/pressrelease/environmentally-friendly-method-could-lower-costs-to-recycle-lithium-ion-batteries

### The mobility rEVolution: Hybrid lithium-ion battery capable of recharging within a minute – pv magazine International

22 April <u>https://www.pv-magazine.com/2022/04/22/the-mobility-revolution-hybrid-lithium-ion-battery-capable-of-recharging-within-a-minute</u>

### Selection of oxygen reduction catalysts for secondary tri-electrode zinc–air batteries | Scientific Reports

23 April https://www.nature.com/articles/s41598-022-10671-5 DOI https://doi.org/10.1038/s41598-022-10671-5

#### **Can 'Lithium Valley' help solve US battery supply chain challenges? - Energy Storage News** 20 April

https://www.energy-storage.news/can-lithium-valley-help-solve-us-battery-supply-chain-challenges

# Core-shell structure of LiMn2O4 cathode material reduces phase transition and Mn dissolution in Li-ion batteries

19 April Core-shell structure of LiMn2O4 cathode material reduces phase transition and Mn dissolution in Li-ion batteries | Communications Chemistry (nature.com) DOI https://doi.org/10.1038/s42004-022-00670-y

### Crystalline hydrogen bonding of water molecules confined in a metal-organic framework

8 April Crystalline hydrogen bonding of water molecules confined in a metal-organic framework | Communications Chemistry (nature.com) DOI https://doi.org/10.1038/s42004-022-00666-8

### **Chemingineering - Non-Lithium Batteries : Chemical Industry Digest**

4 April <u>https://chemindigest.com/chemingineering-non-lithium-batteries</u>

### Reinventing lead carbon batteries for the 21st century automotive industry

? April

#### **Capturing Carbon With Inspiration From Battery Chemistry – CleanTechnica** 26 April

https://cleantechnica.com/2022/04/26/capturing-carbon-with-inspiration-from-battery-chemistry

#### **New Energy Storage System Is More Efficient and Potentially Transformative** 26 April

https://scitechdaily.com/new-energy-storage-system-is-more-efficient-and-potentially-transformative DOI: 10.1021/acs.jpclett.1c01930

#### Scientists investigate lithium-ion batteries' reliance on rare metals

28 April 2022 Scientists investigate lithium-ion batteries' reliance on rare metals (innovationnewsnetwork.com)

#### Green battery architecture is accelerating energy storage solutions

28 April Green battery architecture is accelerating energy storage solutions (innovationnewsnetwork.com)

### Lithium-ion battery charged to 60% in 5.6 minutes with ordered anode

28 April <u>https://techxplore.com/news/2022-04-lithium-ion-battery-minutes-anode.html</u>

### New Research Examines Keys to Making Batteries Last Longer

2 May New Research Examines Keys to Making Batteries Last Longer (scitechdaily.com) DOI: 10.1126/science.abm8962

#### Visualizing the Key Minerals in an EV Battery

2 May <u>https://elements.visualcapitalist.com/the-key-minerals-in-an-ev-battery</u>

### A cost-effective alkaline polysulfide-air redox flow battery enabled by a dualmembrane cell architecture | Nature Communications

2 May https://www.nature.com/articles/s41467-022-30044-w DOI https://doi.org/10.1038/s41467-022-30044-w

#### **Bacterial Enzyme Converts CO2 Into Carbon Compounds 20x Faster Than Photosynthesis**

3 May

Bacterial Enzyme Converts CO2 Into Carbon Compounds 20x Faster Than Photosynthesis (scitechdaily.com) DOI: 10.1021/acscentsci.2c00057

### Li-Metal Gets Grant To Advance Lithium Metal Solid-State Batteries – CleanTechnica

3 May <u>https://cleantechnica.com/2022/05/03/li-metal-gets-grant-to-advance-lithium-metal-solid-state-batteries</u>

### **US homebuilder chooses zinc-ion over lithium-ion for home storage** 5 May

https://www.energy-storage.news/us-homebuilder-chooses-zinc-ion-for-home-storage-citing-a-lot-of-issues-with-lithium-ion

### A new battery design could unlock low-cost energy storage

4 May

https://interestingengineering.com/a-new-type-of-battery-provides-low-cost-long-term-energy-storage

### The mobility rEVolution: New lithium-ion battery material for faster charging times – pv magazine International

6 May

 $\underline{https://www.pv-magazine.com/2022/05/06/the-mobility-revolution-new-lithium-ion-battery-material-for-faster-charging-times}$ 

### Three battery energy storage trends for the electrification of everything – pv magazine International

3 May

https://www.pv-magazine.com/2022/05/03/two-battery-energy-storage-trends-for-the-electrification-of-everything

### **Rechargeable Molten Salt Battery Freezes Energy in Place for Long-Term Storage -Scientific American**

6 May

 $\underline{https://www.scientificamerican.com/article/rechargeable-molten-salt-battery-freezes-energy-in-place-for-long-term-storage}$ 

# Breakthrough in Battery Design: First Realistic Portraits of Squishy Layer That's Key to Battery Performance

8 May Breakthrough in Battery Design: First Realistic Portraits of Squishy Layer That's Key to Battery Performance (scitechdaily.com) DOI: 10.1126/science.abi8703 DOI: 10.1021/see secounts 1:000182

DOI: 10.1021/acs.accounts.1c00183

### Bringing 'Dead' Batteries Back to Life – Researchers Extend Battery Lifetime by 30%

8 May

Bringing 'Dead' Batteries Back to Life – Researchers Extend Battery Lifetime by 30% (scitechdaily.com) DOI: 10.1038/s41586-021-04168-w

#### Li-Cycle: Sustainable lithium-ion battery recycling technology

10 May Li-Cycle: Sustainable lithium-ion battery recycling technology (innovationnewsnetwork.com)

### Breakthrough in Battery Design: First Realistic Portraits of Squishy Layer That's Key to Battery Performance

8 May https://scitechdaily.com/breakthrough-in-battery-design-first-realistic-portraits-of-squishy-layer-thats-key-tobattery-performance DOI: 10.1126/science.abi8703 DOI: 10.1021/acs.accounts.1c00183

## Metal electrolysis could support more efficient, eco-friendly processes for producing battery metals - MINING.COM

8 May

https://www.mining.com/metal-electrolysis-could-support-more-efficient-eco-friendly-processes-for-producing-battery-metals

### Theory-guided experimental design in battery materials research

11 May https://www.science.org/doi/10.1126/sciadv.abm2422 DOI: 10.1126/sciadv.abm2422

### Correlation of Oxygen Anion Redox Activity to In - Plane Honeycomb Cation Ordering in NaxNiyMn1–yO2 Cathodes - Li - - Advanced Energy and Sustainability Research - Wiley Online Library

10 may https://onlinelibrary.wiley.com/doi/full/10.1002/aesr.202200027 https://doi.org/10.1002/aesr.202200027

### Silicon-Lithium EV Batteries Deliver Longer Range, Faster Charging

9 May

 $\underline{https://cleantechnica.com/2022/05/09/more-bad-news-for-fossil-fuels-silicon-lithium-ev-batteries-deliver-next-level-performance$ 

### Manganese Could Be the Missing Link of Truly Affordable EV Batteries – autoevolution

14 May Manganese Could Be the Missing Link of Truly Affordable EV Batteries - autoevolution

### Sustainable conversion of biomass to rationally designed lithium-ion battery graphite

16 May Sustainable conversion of biomass to rationally designed lithium-ion battery graphite | Scientific Reports (nature.com) DOI https://doi.org/10.1038/s41598-022-11853-x

### How Long Do Electric Car Batteries Actually Last?

17 May https://www.howtogeek.com/797103/how-long-do-electric-car-batteries-last

### Will swapping out electric car batteries catch on? - BBC News

17 May https://www.bbc.com/news/business-61310513

### Long-duration energy storage 'for everyone' says US DoE as McKinsey publishes advice to corporates

16 May LDES 'for everyone' says US Department of Energy (energy-storage.news)

### Navigating the minefield of battery literature | Communications Materials

18 May https://www.nature.com/articles/s43246-022-00251-5

# Cost comparison between lithium batteries, fuel cells, reversible solid oxide cells as storage for off-grid rooftop PV – pv magazine International <sup>18</sup> Mav

Cost comparison between lithium batteries, fuel cells, reversible solid oxide cells as storage for off-grid rooftop PV – pv magazine International (pv-magazine.com)

### Inverse-opal structured TiO2 regulating electrodeposition behavior to enable stable lithium metal electrodes – ScienceDirect

1 April Inverse-opal structured TiO2 regulating electrodeposition behavior to enable stable lithium metal electrodes -ScienceDirect https://doi.org/10.1016/j.gee.2022.03.010

### **Engineers evaluate the factors affecting battery performance at low temperatures** 20 May

Engineers evaluate the factors affecting battery performance at low temperatures (phys.org) DOI: 10.26599/NRE.2022.9120003

### **Inside Clean Energy: Flow Batteries Could Be a Big Part of Our Energy Storage Future. So What's a Flow Battery? - Inside Climate News**

19 May Inside Clean Energy: Flow Batteries Could Be a Big Part of Our Energy Storage Future. So What's a Flow Battery? - Inside Climate News

### Tesla battery research group unveils paper on new high-energy-density battery that could last 100 years – Electrek

24 May Tesla battery research group unveils paper on new high-energy-density battery that could last 100 years - Electrek

## Production of high-energy Li-ion batteries comprising silicon-containing anodes and insertion-type cathodes | Nature Communications

15 September 2021 Production of high-energy Li-ion batteries comprising silicon-containing anodes and insertion-type cathodes | Nature Communications DOI https://doi.org/10.1038/s41467-021-25334-8

### A saccharide-based binder for efficient polysulfide regulations in Li-S batteries | Nature Communications

10 September 2021 https://www.nature.com/articles/s41467-021-25612-5 DOI https://doi.org/10.1038/s41467-021-25612-5

### **Electric Planes: A novel lithium-air battery could pave the way for electric passenger planes**

23 May Electric Planes: A novel lithium-air battery could pave the way for electric passenger planes (interestingengineering.com)

#### New Low-Cost Battery-Like Device Captures CO2 Emissions While It Charges 25 May New Low-Cost Battery-Like Device Captures CO2 Emissions While It Charges (scitechdaily com)

New Low-Cost Battery-Like Device Captures CO2 Emissions While It Charges (scitechdaily.com) DOI: 10.1039/D2NR00748G

# Battery storage to be critical part of Ireland's energy transition, says Eamon Ryan – The Irish Times

26 May Battery storage to be critical part of Ireland's energy transition, says Eamon Ryan – The Irish Times

### British developer gets green light for 200 MW battery

26 May British developer gets green light for 200 MW battery – pv magazine International (pv-magazine.com)

### **Electrode Design Paves Way for High-Performance Hybrid Biofuel Cells** 29 May

Electrode Design Paves Way for High-Performance Hybrid Biofuel Cells (scitechdaily.com) DOI: 10.1063/5.0084917

### **Improving Battery Performance at Low Temperatures**

28 March Improving Battery Performance at Low Temperatures (scitechdaily.com) DOI: 10.26599/NRE.2022.9120003

#### Are Microwave-Safe Plastic Containers \*Actually\* Safe To Microwave?

21 May <u>Is It Actually Safe To Microwave "Microwave-Safe" Plastic? (mindbodygreen.com)</u>

### **Improving Battery Performance at Low Temperatures**

28 May Improving Battery Performance at Low Temperatures (scitechdaily.com) DOI: 10.26599/NRE.2022.9120003

#### Nanofiber-Based Electrodes Support Next-Gen Li-Ion Batteries

25 May https://www.azonano.com/news.aspx?newsID=39174 https://pubs.acs.org/doi/10.1021/acsaem.2c00487

### New technology uses magnetic nanoparticles to extract lithium from water - Inceptive Mind

28 May

https://www.inceptivemind.com/new-technology-uses-magnetic-nanoparticles-extract-lithium-water/24857

### **Researchers Develop Sodium Glassy Electrolytes Capable of Supporting Long-Duration Grid-scale Energy Storage**

31 May

Researchers Develop Sodium Glassy Electrolytes Capable of Supporting Long-Duration Grid-scale Energy Storage - University of Houston (uh.edu)



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### Green Hydrogen & Fuel Cells Chemistry & Technology

### **Creating a hydrogen economy: a bumpy road ahead for the EU – EURACTIV.com** 1 March

Creating a hydrogen economy: a bumpy road ahead for the EU - EURACTIV.com

#### **New Screening System May Point The Way To Clean, Renewable Hydrogen Power** 1 March

https://fuelcellsworks.com/news/new-screening-system-may-point-the-way-to-clean-renewable-hydrogen-power

#### 'The cheapest way to ship green hydrogen is via e-methane — we will help wean Germany off Russian gas'

2 March

'The cheapest way to ship green hydrogen is via e-methane — we will help wean Germany off Russian gas' | Recharge (rechargenews.com)

### Interstitial boron-triggered electron-deficient Os aerogels for enhanced pH-universal hydrogen evolution | Nature Communications

3 March Interstitial boron-triggered electron-deficient Os aerogels for enhanced pH-universal hydrogen evolution | Nature Communications DOI https://doi.org/10.1038/s41467-022-28805-8

#### The Potential of Hydrogen for Decarbonization: Evaluating Zero-Carbon "Green" Hydrogen Against Renewable and Nuclear Power

20 January 2021 <u>The Potential of Hydrogen for Decarbonization: Evaluating Zero-Carbon "Green" Hydrogen Against Renewable</u> and Nuclear Power (resources.org)

### Clean Hydrogen Partnership: €300m fund to be made available for hydrogen and fuel cells in Europe

1 March

<u>Clean Hydrogen Partnership: €300m fund to be made available for hydrogen and fuel cells in Europe (h2-view.com)</u>

### Norway to build new facility that uses electrolysers to create e-fuels for aircraft

28 February Norway to build new facility that uses electrolysers to create e-fuels for aircraft (h2-view.com)

### **Production of a monolithic fuel cell stack with high power density | Nature Communications**

10 March https://www.nature.com/articles/s41467-022-28970-w DOI https://doi.org/10.1038/s41467-022-28970-w

### How an Airbus test on an A380 will try out hydrogen fuel | Popular Science

11 March https://www.popsci.com/technology/hydrogen-power-reshapes-aircraft-work

## The Hydrogen Stream: Metal foam for low-cost green hydrogen generation – pv magazine International

11 March

https://www.pv-magazine.com/2022/03/11/the-hydrogen-stream-metal-foam-for-low-cost-green-hydrogen-generation

### Why Levidian's LOOP technology is a 'vital' step forward for the hydrogen industry 10 March

Why Levidian's LOOP technology is a 'vital' step forward for the hydrogen industry (h2-view.com)

## A high-performance capillary-fed electrolysis cell promises more cost-competitive renewable hydrogen | Nature Communications

15 March https://www.nature.com/articles/s41467-022-28953-x DOI https://doi.org/10.1038/s41467-022-28953-x

### Australian electrolyser breakthrough promises world's cheapest green hydrogen | RenewEconomy

16 March <u>https://reneweconomy.com.au/australian-electrolyser-breakthrough-promises-worlds-cheapest-green-hydrogen</u>

### Green hydrogen for heating 'would double energy bills, reduce GDP and put climate targets out of reach'

17 March Green hydrogen for heating 'would double energy bills, reduce GDP and put climate targets out of reach' | Recharge (rechargenews.com)

### The Hydrogen Risks For Homeowners & Public Money — CleanTech Talk – CleanTechnica

19 March The Hydrogen Risks For Homeowners & Public Money — CleanTech Talk - CleanTechnica

# Scientists Discover a New, Sustainable Way To Make Hydrogen for Fuel Cells and Fertilizers

17 March

Scientists Discover a New, Sustainable Way To Make Hydrogen for Fuel Cells and Fertilizers (scitechdaily.com) DOI: 10.1038/s41929-021-00732-9

### The epic attempts to power planes with hydrogen - BBC Future

21 March

The epic attempts to power planes with hydrogen - BBC Future

### Monolithic fuel cell with power density of 5.6kW/L – pv magazine International

21 March https://www.pv-magazine.com/2022/03/21/monolithic-fuel-cell-with-power-density-of-5-6kw-l

### New ferrocenium-based anion-exchange membranes for fuel cells

22 March

https://techxplore.com/news/2022-03-ferrocenium-based-anion-exchange-membranes-fuel-cells.html DOI: 10.1038/s41560-022-00978-y

## China unveils national 2025 target for green hydrogen and new strategies for further H2 growth

23 March

China unveils national 2025 target for green hydrogen and new strategies for further H2 growth | Recharge (rechargenews.com)

### Atomic-precision Pt6 nanoclusters for enhanced hydrogen electro-oxidation | Nature Communications

24 March https://www.nature.com/articles/s41467-022-29276-7 DOI https://doi.org/10.1038/s41467-022-29276-7

## The Hydrogen Stream: New tech to convert hydrogen into methanol for transportation – pv magazine International

25 March The Hydrogen Stream: New tech to convert hydrogen into methanol for transportation – pv magazine International (pv-magazine.com)

### How does a hydrogen engine work?

26 March How does a hydrogen engine work - Hydrogen Fuel News

### German aerospace's groundbreaking plug-in fuel cell concept - newmobility.news

23 March German aerospace's groundbreaking plug-in fuel cell concept - newmobility.news

# This is what the massive international clean hydrogen trade may look like in 2050, according to Irena

29 March

This is what the massive international clean hydrogen trade may look like in 2050: Irena | Recharge (rechargenews.com)

# Hydrogen blending will raise consumer costs and risk public health while barely reducing emissions: US think-tank

30 March Hydrogen blending will raise consumer costs and risk public health while barely reducing emissions: US think-tank Recharge (rechargenews.com)

### **Designs for solar+storage+hydrogen systems in buildings – pv magazine International** 29 March

Designs for solar+storage+hydrogen systems in buildings - pv magazine International (pv-magazine.com)

# A completely precious metal–free alkaline fuel cell with enhanced performance using a carbon-coated nickel anode | PNAS

21 March https://www.pnas.org/doi/10.1073/pnas.2119883119 https://doi.org/10.1073/pnas.2119883119

# Cost of hydrogen electrolysers to fall this decade at similar rates to solar and wind, says Irena | Recharge

29 March

 $\label{eq:https://www.rechargenews.com/energy-transition/cost-of-hydrogen-electrolysers-to-fall-this-decade-at-similar-rates-to-solar-and-wind-says-irena/2-1-1192868$ 

### Siemens Energy to build 'multi-gigawatt' hydrogen electrolyser factory in Berlin | Recharge

#### 31 March

 $\underline{https://www.rechargenews.com/energy-transition/siemens-energy-to-build-multi-gigawatt-hydrogen-electrolyser-factory-in-berlin/2-1-1194180$ 

### Hydrogen storage reactions bear a complex dance toward faster uptake 30 March

Hydrogen storage reactions bear a complex dance toward faster uptake (phys.org) DOI: 10.1021/acsami.1c23524

### Efficient Electrocatalytic Overall Water Splitting on a Copper-Rich Alloy: An Electrochemical Study | Energy & Fuels

1 April https://pubs.acs.org/doi/10.1021/acs.energyfuels.1c04432 https://doi.org/10.1021/acs.energyfuels.1c04432

### The Hydrogen Stream: Electrochemical pump for hydrogen purification – pv magazine International

1 April 2022

https://www.pv-magazine.com/2022/04/01/the-hydrogen-stream-electrochemical-pump-for-hydrogen-purification

#### New method for hydrogen purification

30 March https://www.industryandenergy.eu/hydrogen/new-method-for-hydrogen-purification

### Hydrogen Europe unveils lighthouse initiative to support large-scale hydrogen deployment in the EU

30 March Hydrogen Europe unveils lighthouse initiative to support large-scale hydrogen deployment in the EU (h2-view.com)

### Nuclear energy plants could help accelerate hydrogen adoption with reduced costs

29 April 2021 Nuclear energy plants could help accelerate hydrogen adoption with reduced costs (h2-view.com)

### The Hydrogen Stream: New tech for solar water splitting – pv magazine International

5 April

https://www.pv-magazine.com/2022/04/05/the-hydrogen-stream-new-tech-for-solar-water-splitting

### **Renewable offshore floating hydrogen production – pv magazine International**

7 April Renewable offshore floating hydrogen production – pv magazine International (pv-magazine.com)

### 8,000% growth | 'More than 100GW of hydrogen electrolysers to be produced annually by 2031' | Recharge

12 April

 $\underline{https://www.rechargenews.com/energy-transition/8-000-growth-more-than-100gw-of-hydrogen-electrolysers-to-be-produced-annually-by-2031/2-1-1201444}$ 

### **Extract from a common kitchen spice could be key to greener, more efficient fuel cells** 18 April

Extract from a common kitchen spice could be key to greener, more efficient fuel cells (phys.org) DOI: 10.1016/j.nanoen.2022.106966

### A greener future: Lithium-ion batteries and Hydrogen fuel cells

8 February <u>A greener future: Lithium-ion batteries and Hydrogen fuel cells | CAS</u> **Does hydrogen have any hope as a clean fuel? – Vox** 18 April https://www.vox.com/recode/22973204/hydrogen-energy-power-toyota-mirai-climate-change

### Pioneering large-scale green ammonia project gets world's first clean hydrogen certificate

20 April <u>Pioneering large-scale green ammonia project gets world's first clean hydrogen certificate | Recharge</u> <u>(rechargenews.com)</u>

### **Cheaper Hydrogen Fuel Cell Invented – Enabling Better Green Energy Options**

25 April <u>Cheaper Hydrogen Fuel Cell Invented – Enabling Better Green Energy Options (scitechdaily.com)</u> DOI: 10.1038/s41929-022-00772-9

## Indian Scientists Produce Clean H2 With Carbon Capture Efficiency of 99.58% - Mercom India

21 April https://mercomindia.com/indian-scientists-produce-clean-h2-with-carbon-capture-efficiency

#### Liquid ammonia is the 'best route to carbon-free flight', says hydrogen aviation startup

28 April Liquid ammonia is the 'best route to carbon-free flight', says hydrogen aviation start-up | Recharge (rechargenews.com)

## 'Cheaper green hydrogen' | US start-up's novel low-cost electrolyser promises 30% more bang per buck

28 April 'Cheaper green hydrogen' | US start-up's novel low-cost electrolyser promises 30% more bang per buck | Recharge (rechargenews.com)

### Solid-State Hydrogen Storage Might Be an Alternative to Batteries

28 April https://www.popularmechanics.com/science/a39679657/solid-state-hydrogen-storage-battery-alternative

# Extremely lightweight hydrogen tanks could quadruple the range of passenger airliners

25 April

# US startup claims hydrogen output for \$0.85/kg or less via new water vapor electrolyzer – pv magazine International

2 May

<u>US startup claims hydrogen output for \$0.85/kg or less via new water vapor electrolyzer – pv magazine International (pv-magazine.com)</u>

#### DOE close to loaning \$500 million for world's largest green hydrogen plant

26 April

https://www.solarpowerworldonline.com/2022/04/doe-close-to-loaning-worlds-largest-green-hydrogen-plant

#### **European design for a 37,500 cu m liquefied hydrogen carrier unveiled - Splash247** 3 May 2022

European design for a 37,500 cu m liquefied hydrogen carrier unveiled - Splash247

### The Hydrogen Stream: Acid-treated cells produce about 200% more hydrogen – pv magazine International

3 May

The Hydrogen Stream: Acid-treated cells produce about 200% more hydrogen – pv magazine International (pv-magazine.com)

#### What's best for Hydrogen transport: ammonia, liquid hydrogen, LOHC or pipelines? - Energy Post

5 May

https://energypost.eu/whats-best-for-hydrogen-transport-ammonia-liquid-hydrogen-lohc-or-pipelines

#### Cleanly converting solar energy into storable hydrogen fuel

6 May <u>Cleanly converting solar energy into storable hydrogen fuel (innovationnewsnetwork.com)</u>

### Perovskites studied as potential material to produce renewable hydrogen – pv magazine International

6 May

Perovskites studied as potential material to produce renewable hydrogen – pv magazine International (pv-magazine.com)

#### NREL advances renewable hydrogen production process

6 May NREL advances renewable hydrogen production process - (industryandenergy.eu)

#### New Role For Concentrating Solar Power, With Green Hydrogen & A Perovksite Twist

11 May

A New Role For Concentrating Solar Power: Low-Cost Green Hydrogen (cleantechnica.com)

#### A new method can convert solar energy into useful hydrogen

11 May

A new method can convert solar energy into useful hydrogen (interestingengineering.com) and

### A breakthrough method uses solar energy to produce green hydrogen from water

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IRISH CHEMICAL NEWS ISSUE NO.2 MAY/ JUNE 2022

# The Hydrogen Stream: Carbon-coated nickel anode to solve problems of hydrogen fuel cell without precious metals – pv magazine International

13 May

The Hydrogen Stream: Carbon-coated nickel anode to solve problems of hydrogen fuel cell without precious metals – pv magazine International (pv-magazine.com)

## EU announces 'full switch' of existing grey hydrogen production to green H2, backed by carbon contracts

18 May

EU announces 'full switch' of existing grey hydrogen production to green H2, backed by carbon contracts | Recharge (rechargenews.com)

### A breakthrough method uses solar energy to produce green hydrogen from water $13\,\mathrm{May}$

https://interestingengineering.com/green-hydrogen-from-water

## Plans for Mayo green hydrogen production facility progressing | Connaught Telegraph

18 May

https://www.con-telegraph.ie/2022/05/18/plans-for-mayo-green-hydrogen-production-facility-progressing

# "Because of the practical nature of the technology, hydrogen ICEs can help accelerate decarbonisation making it a very relevant topic," says Cummins

20 May

"Because of the practical nature of the technology, hydrogen ICEs can help accelerate decarbonisation making it a very relevant topic," says Cummins (h2-view.com)

### Graphene-wrapped zeolite membranes for fast hydrogen separation

18 May Graphene-wrapped zeolite membranes for fast hydrogen separation (phys.org) DOI: 10.1126/sciadv.abl3521. www.science.org/doi/10.1126/sciadv.abl3521

### Report: Hydrogen Lined Up As NZ's Next Big Export | Newsroom

23 May https://www.newsroom.co.nz/a-hydrogen-economy-for-new-zealand

### Proposed stringent EU rules on green hydrogen 'would put the brakes on development'

24 May

Proposed stringent EU rules on green hydrogen 'would put the brakes on development' | Recharge (rechargenews.com)

# Commoditising hydrogen | International trading of green ammonia could begin as soon as 2025: Trafigura

25 May

Commoditising hydrogen | International trading of green ammonia could begin as soon as 2025: Trafigura | Recharge (rechargenews.com)

### Seven pages will decide the future of green hydrogen in Europe

8 December 2021 Seven pages will decide the future of green hydrogen in Europe (energymonitor.ai)

### G7 unveils controversial 'hydrogen action pact' to tackle climate crisis and Russian gas reliance

31 May

<u>G7</u> unveils controversial 'hydrogen action pact' to tackle climate crisis and Russian gas reliance | Recharge (rechargenews.com)



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### Solar Cell Chemistry & Technology

#### An introduction to Perovskites

What is a Perovskite material? | Perovskite-Info

#### What are perovskites and their applications

What are perovskites and their applications (nanowerk.com)

### Meet perovskite, the mystery mineral that could transform our solar energy future

20 December 2018 Meet perovskite, the mystery mineral that could transform our solar energy future | (ted.com)

#### **Perovskite Solar Cells**

Perovskite Solar Cells | Department of Energy

#### The reality behind solar power's next star material

25 June 2019 <u>The reality behind solar power's next star material (nature.com)</u> doi: https://doi.org/10.1038/d41586-019-01985-y

#### Perovskites and Perovskite Solar Cells: An Introduction

Perovskites Solar Cell Structure, Efficiency & More | Ossila

#### Perovskites: crystal structure, important compounds and properties (Powerpoint)

12,04,2016 <u>PowerPoint Presentation (epfl.ch)</u> https://www.epfl.ch/labs/gmf/wpcontent/uploads/2018/10/Perovskites\_crystal\_structure\_important\_compounds\_properties.pdf

### **Crystallography and Chemistry of Perovskites**

<u>qw.txt (arxiv.org)</u> https://arxiv.org/ftp/cond-mat/papers/0506/0506606.pdf

#### The story of a solar cell

11 March The story of a solar cell | Enel Green Power

### It's A New Dawn For Concentrating Solar Power

13 March https://cleantechnica.com/2022/03/13/its-a-new-dawn-for-concentrating-solar-power

#### MIT's Clever Way To Clean Solar Panels Without Water

18 March <u>MIT's Clever Way To Clean Solar Panels Without Water (scitechdaily.com)</u> <u>DOI: 10.1126/sciadv.abm0078</u>

### The UK May Build a £16 Billion Solar Power Station in Space. Here's How It Would Work

18 March

The UK May Build a £16 Billion Solar Power Station in Space. Here's How It Would Work (singularityhub.com)

#### Record efficiencies in thin film photovoltaic cells

28 March Record efficiencies in thin film photovoltaic cells (phys.org) DOI: 10.1021/acsphotonics.1c01668

### Disorder-engineered inorganic nanocrystals set a new efficiency record for ultrathin solar cells

14 February Disorder-engineered inorganic nanocrystals set a new efficiency record for ultrathin solar cells (phys.org) DOI: 10.1038/s41566-021-00950-4

#### Scientists achieve ground-breaking results with photovoltaic solar panels

29 March Scientists achieve groundbreaking results with photovoltaic solar panels (innovationnewsnetwork.com)

### Engineering Surface Orientations for Efficient and Stable Hybrid Perovskite Single-Crystal Solar Cells | ACS Energy Letters

29 March https://pubs.acs.org/doi/10.1021/acsenergylett.2c00431 https://doi.org/10.1021/acsenergylett.2c00431

#### Solar panels, made from food waste, produce energy without sunlight

3 April <u>https://www.thebrighterside.news/post/solar-panels-made-from-food-waste-produce-energy-without-sunlight</u>

### **Stanford engineers invent a solar panel that generates electricity at night** 5 April

Stanford engineers invent a solar panel that generates electricity at night (interestingengineering.com)

#### Quantum innovation advances low-cost alternative solar technology

8 April https://phys.org/news/2022-04-quantum-advances-low-cost-alternative-solar.html DOI: 10.1038/s41566-022-00985-1

#### Solar energy can now be stored for up to 18 years, say scientists | Euronews

12 April Solar energy can now be stored for up to 18 years, say scientists | Euronews

### Solar Cell Keeps Working Long After Sun Sets - AIP Publishing LLC

5 April Solar Cell Keeps Working Long After Sun Sets - AIP Publishing LLC DOI: 10.1063/5.0085205

### New Photovoltaic Cell Makes Electricity From Thermal Radiation – CleanTechnica

19 April <u>https://cleantechnica.com/2022/04/11/new-photovoltaic-cell-makes-electricity-from-thermal-radiation</u>

### Fixing the interface for enhanced perovskite solar cell performance - Research Outreach

9 September 2021 Fixing the interface for enhanced perovskite solar cell performance - Research Outreach

### Converting solar energy to electricity possible with novel method

12 April Converting solar energy to electricity possible with novel method (innovationnewsnetwork.com)

### **Researchers Set New World Record for Solar Cell Efficiency**

14 April Researchers Set New World Record for Solar Cell Efficiency (scitechdaily.com) DOI: 10.1038/s41586-022-04455-0

### World record achieved for solar power 'miracle material'

13 April World record achieved for solar power 'miracle material' | The Independent

#### Modified, Solvothermally Derived Cr-doped SnO2 Nanostructures for Enhanced Photocatalytic and Electrochemical Water-Splitting Applications | ACS Omega 16 April

https://pubs.acs.org/doi/10.1021/acsomega.2c00707# https://doi.org/10.1021/acsomega.2c00707

#### **Enhanced Energy Storage Capacity of Graphene Supercapacitors via Solar Heating** 15 April

Enhanced Energy Storage Capacity of Graphene Supercapacitors via Solar Heating (scitechdaily.com) DOI: 10.1039/D1TA09222G

### **Capturing Solar Energy and Converting It to Electricity When Needed – Up to 18 Years Later**

18 April

Capturing Solar Energy and Converting It to Electricity When Needed – Up to 18 Years Later (scitechdaily.com) DOI: 10.1016/j.xcrp.2022.100789

### The Solar Energy Multiverse Keeps Expanding

18 April

https://cleantechnica.com/2022/04/18/the-solar-energy-multiverse-keeps-expanding-perovskites-shape-shifting-molecules-more

# Lanthanide doped lead-free double perovskites as the promising next generation ultra-broadband light sources | Light: Science & Applications

19 April https://www.nature.com/articles/s41377-022-00782-z DOI https://doi.org/10.1038/s41377-022-00782-z

### Twisting, Flexible Crystals Key to Advanced New Solar Cells

15 March 2021 https://scitechdaily.com/twisting-flexible-crystals-key-to-advanced-new-solar-cells/amp

### Spain curtails PV for first time – pv magazine International

20 April Spain curtails PV for first time – pv magazine International (pv-magazine.com)

### New Materials Enable Cheaper Solar Cells That Are Easier To Make

21 April New Materials Enable Cheaper Solar Cells That Are Easier To Make (scitechdaily.com)

### New Materials Enable Cheaper Solar Cells That Are Easier To Make

21 April 2021 <u>New Materials Enable Cheaper Solar Cells That Are Easier To Make (scitechdaily.com)</u> DOI: 10.1126/science.abm8566

### Templating Approach Stabilizes "Ideal" Perovskite Material for Cheap, Efficient Solar Cells

23 December 2021 <u>Templating Approach Stabilizes "Ideal" Perovskite Material for Cheap, Efficient Solar Cells (scitechdaily.com)</u> <u>DOI: 10.1126/science.abl4890</u>

### Future of High Efficiency Perovskite Solar Cells Shines a Little Brighter

15 July 2021 <u>Future of High Efficiency Perovskite Solar Cells Shines a Little Brighter (scitechdaily.com)</u> <u>DOI: 10.1016/j.nanoen.2021.106152</u>

### Ionic liquid-based perovskite solar cell with 22.86% efficiency – pv magazine International

26 April

Ionic liquid-based perovskite solar cell with 22.86% efficiency – pv magazine International (pv-magazine.com)

### Japan's first vertical agrivoltaic project

26 April Japan's first vertical agrivoltaic project – pv magazine International (pv-magazine.com)

#### Ireland's first large-scale solar farm opens in Wicklow

29 April https://www.rte.ie/news/ireland/2022/0429/1295115-solar-farm

#### Solar cell keeps going after sunset – Physics World

27 April https://physicsworld.com/a/solar-cell-keeps-going-after-sunset/

### **Perovskite potential | Nature Electronics**

28 April https://www.nature.com/articles/s41928-022-00763-5 DOI https://doi.org/10.1038/s41928-022-00763-5

### Titanium oxide nanoparticle-based perovskite PV cell with 24.05% efficiency – pv magazine International

3 May

https://www.pv-magazine.com/2022/05/03/titanium-oxide-nanoparticle-based-perovskite-pv-cell-with-24-05efficiency

### Four-terminal tandem perovskite solar cell design with 30.14% efficiency

27 April

Four-terminal tandem perovskite solar cell design with 30.14% efficiency – pv magazine International (pv-magazine.com)

# Tracking perovskite crystallization via deep learning-based feature detection on 2D X-ray scattering data | npj Computational Materials

3 May https://www.nature.com/articles/s41524-022-00778-8 DOI https://doi.org/10.1038/s41524-022-00778-8

### Australian researchers show solar power can be generated at night - ABC News 16 May

https://www.abc.net.au/news/2022-05-17/australian-researchers-show-solar-power-can-be-generated-atnigh/101070388 and

#### New Kind of 'Solar' Cell Shows We Can Generate Electricity Even at Night 18 March

New Kind of 'Solar' Cell Shows We Can Generate Electricity Even at Night (sciencealert.com)

### Saatvik launches 545 W bifacial PV modules – pv magazine International

9 May https://www.pv-magazine.com/2022/05/09/saatvik-launches-545-w-bifacial-pv-modules

### Solar that works in the shade – pv magazine International

18 May https://www.pv-magazine.com/2022/05/18/solar-that-works-in-the-shade

### Solar 'transformation' on the way as 66 new solar farms approved to supply electricity - Independent.ie

20 May Solar 'transformation' on the way as 66 new solar farms approved to supply electricity - Independent.ie

### Floating solar farms could be worth \$10 billion by 2030, but they have

19 May

https://www.fastcompany.com/90753491/floating-solar-farms-could-be-worth-10-billion-by-2030-but-they-have-adirty-secret

### Quantum well superlattices for a new world record cell efficiency of 39.5% – pv magazine International

19 May

Quantum well superlattices for a new world record cell efficiency of 39.5% – pv magazine International (pv-magazine.com)

### **One-Dimensional Perovskite-like Cu(I)-Halides with Ideal Bandgap Based on Quantum-Well Structure | Inorganic Chemistry**

20 May https://pubs.acs.org/doi/10.1021/acs.inorgchem.2c00531 https://doi.org/10.1021/acs.inorgchem.2c00531

### Secret to treating 'Achilles' heel' of perovskite alternatives to silicon solar panels revealed

24 May Secret to treating 'Achilles' heel' of perovskite alternatives to silicon solar panels revealed (phys.org) DOI: 10.1038/s41586-022-04872-1. www.nature.com/articles/s41586-022-04872-1 DOI: 10.1126/science.abl4890

## Heterojunction solar cell with 25.18% efficiency, 85.42% fill factor – pv magazine International

23 May

Heterojunction solar cell with 25.18% efficiency, 85.42% fill factor - pv magazine International (pv-magazine.com)

### Solar Panels and the Potential of Perovskite - The Eco Experts

24 May Solar Panels and the Potential of Perovskite - The Eco Experts

### JinkoSolar showcases 13.08%-efficient transparent TOPCon solar module for BIPV, agrivoltaics – pv magazine International

24 May JinkoSolar showcases 13.08%-efficient transparent TOPCon solar module for BIPV, agrivoltaics – pv magazine International (pv-magazine.com)

**Solar-plus-storage vs. wind-plus-storage – pv magazine International** 30 May Solar-plus-storage vs. wind-plus-storage – pv magazine International (pv-magazine.com)

## In situ growth of graphene on both sides of a Cu–Ni alloy electrode for perovskite solar cells with improved stability | Nature Energy

30 May

In situ growth of graphene on both sides of a Cu–Ni alloy electrode for perovskite solar cells with improved stability | Nature Energy DOI https://doi.org/10.1038/s41560-022-01038-1

DOI https://doi.org/10.1038/s41560-022-01038-1

## Fraunhofer ISE achieves 47.6% efficiency with III-V four-junction CPV cell – pv magazine International

30 May

Fraunhofer ISE achieves 47.6% efficiency with III-V four-junction CPV cell – pv magazine International (pv-magazine.com)



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### **Chemistry & Artificial Intelligence**

### **5 AI Applications in Chemistry | Analytics Steps**

24 May 2021 5 AI Applications in Chemistry | Analytics Steps

### AI for chemistry – ChemIntelligence

<u>https://chemintelligence.com/ai-for-</u> chemistry#:~:text=Artificial%20Intelligence%20(AI)%20is%20being,to%20market%20for%20new%20drugs

# **Artificial Intelligence in Chemistry: Current Trends and Future Directions | Journal of Chemical Information and Modeling**

15 July 2021 https://pubs.acs.org/doi/10.1021/acs.jcim.1c00619 https://doi.org/10.1021/acs.jcim.1c00619

### Artificial Intelligence: The Future for Organic Chemistry?

16 October 2018 Artificial Intelligence: The Future for Organic Chemistry? | ACS Omega https://doi.org/10.1021/acsomega.8b01773

### **Current and Future Roles of Artificial Intelligence in Medicinal Chemistry Synthesis**

3 April 2020 Current and Future Roles of Artificial Intelligence in Medicinal Chemistry Synthesis | Journal of Medicinal Chemistry (acs.org) https://doi.org/10.1021/acs.jmedchem.9b02120

### **Concepts of Artificial Intelligence for Computer-Assisted Drug Discovery**

11 July 2019 Concepts of Artificial Intelligence for Computer-Assisted Drug Discovery | Chemical Reviews (acs.org) https://doi.org/10.1021/acs.chemrev.8b00728

### Artificial Intelligence in Drug Discovery: Into the Great Wide Open

8 July 2020 Artificial Intelligence in Drug Discovery: Into the Great Wide Open | Journal of Medicinal Chemistry (acs.org) https://doi.org/10.1021/acs.jmedchem.0c01077

#### **Combining Machine Learning and Computational Chemistry for Predictive Insights Into Chemical Systems**

7 July 2021 <u>Combining Machine Learning and Computational Chemistry for Predictive Insights Into Chemical Systems</u> | <u>Chemical Reviews (acs.org)</u> <u>https://doi.org/10.1021/acs.chemrev.1c00107</u>

#### The Landscape of Artificial Intelligence in Chemistry and Opportunities for Growth. CAS White Paper

The Landscape of Artificial Intelligence in Chemistry and Opportunities for Growth | CAS and associated Blog **Exploring machine learning in chemistry: trends and opportunities | CAS** 29 September 2021 Exploring machine learning in chemistry: trends and opportunities | CAS

### All artificial intelligence articles | Chemistry World (May have to be a RSC member or

register/subscribe. Good data base of articles) 21 January 2022 https://www.chemistryworld.com/artificial-intelligence/2291.tag

#### Best practices in machine learning for chemistry | Nature Chemistry

31 May 2021 https://www.nature.com/articles/s41557-021-00716-z DOI https://doi.org/10.1038/s41557-021-00716-z

#### Scientists combine AI and atomic-scale images in pursuit of better batteries

17 February 2022 https://phys.org/news/2022-02-scientists-combine-ai-atomic-scale-images.html DOI: 10.1038/s41563-021-01191-0

#### Next Decade's AI-Based Drug Development Features Tight Integration of Data and Computation

18 January 2022 Next Decade's AI-Based Drug Development Features Tight Integration of Data and Computation (sciencemag.org)

#### Highly accurate protein structure prediction with AlphaFold

15 July 2021 Highly accurate protein structure prediction with AlphaFold | Nature DOI https://doi.org/10.1038/s41586-021-03819-2

#### Drug discovery with explainable artificial intelligence

13 October 2020 Drug discovery with explainable artificial intelligence | Nature Machine Intelligence DOI https://doi.org/10.1038/s42256-020-00236-4

#### Drug discovery with explainable artificial intelligence

13 October 2020 Drug discovery with explainable artificial intelligence | Nature Machine Intelligence DOI https://doi.org/10.1038/s42256-020-00236-4

#### Can machine-learning models overcome biased datasets? | MIT News | Massachusetts **Institute of Technology**

21 February 2021 Can machine-learning models overcome biased datasets? | MIT News | Massachusetts Institute of Technology

\_\_\_\_\_

### **General Overview of AI**

### What is Artificial Intelligence (AI)? | IBM

3 June 2020 https://www.ibm.com/cloud/learn/what-is-artificial-intelligence

### What is Artificial Intelligence? How Does AI Work? | Built In

#### **What is Artificial Intelligence? How Does AI Work, Applications and Future?** 19 January 2022

https://www.mygreatlearning.com/blog/what-is-artificial-intelligence/?amp

### How Does Artificial Intelligence (AI) Work and Its Applications [Updated]

18 January 2022 How Does Artificial Intelligence (AI) Work and Its Applications [Updated] (simplilearn.com)

## What is Artificial Intelligence (AI) and How Does it Work? - Definition from TechTarget

?

What is Artificial Intelligence (AI) and How Does it Work? - Definition from TechTarget

### What is Artificial Intelligence (AI) and How Does it Work? - TWI

https://www.twi-global.com/technical-knowledge/faqs/what-is-artificial-intelligence

### Advantages and disadvantages of artificial intelligence

https://nexusintegra.io/advantages-disadvantages-artificial-intelligence

### What Is Artificial Intelligence (AI)? | Micro Focus

https://www.microfocus.com/en-us/what-is/artificial-intelligence

### **Big Data and Artificial Intelligence: How They Work Together | Maryville Online**

https://online.maryville.edu/blog/big-data-is-too-big-without-ai

### The Dark Secret at the Heart of AI

17 April 2017 https://www.technologyreview.com/2017/04/11/5113/the-dark-secret-at-the-heart-of-ai

-----

#### Will Transformers Take Over Artificial Intelligence? 10 March

Will Transformers Take Over Artificial Intelligence? | Quanta Magazine

### Chemical engineers use neural networks to discover the properties of metal-organic frameworks

11 March Chemical engineers use neural networks to discover the properties of metal-organic frameworks (phys.org) DOI: 10.1021/jacs.1c07217 DOI: 10.1038/s41597-022-01181-0

### Dual use of artificial-intelligence-powered drug discovery

7 March <u>Dual use of artificial-intelligence-powered drug discovery | Nature Machine Intelligence</u> DOI https://doi.org/10.1038/s42256-022-00465-9

### Dual use of artificial-intelligence-powered drug discovery | Nature Machine Intelligence

7 March

https://www.nature.com/articles/s42256-022-00465-9?utm\_source=Nature+Briefing&utm\_campaign=8f4263cf0ebriefing-dy-20220315&utm\_medium=email&utm\_term=0\_c9dfd39373-8f4263cf0e-45372434 DOI https://doi.org/10.1038/s42256-022-00465-9 Dual use of artificial-intelligence-powered drug discovery | Nature Machine Intelligence

#### Researchers turn to deep learning to decode protein structures

2 March Researchers turn to deep learning to decode protein structures | PNAS https://doi.org/10.1073/pnas.2202107119

### New Algorithm Helps Quantum Computer Crunch Chemistry Equations

16 March <u>New Algorithm Helps Quantum Computer Crunch Chemistry Equations (scitechdaily.com)</u> DOI: 10.1038/s41586-021-04351-z

### Machine Learning Reimagines the Building Blocks of Computing | Quanta Magazine

https://www.quantamagazine.org/machine-learning-reimagines-the-building-blocks-of-computing-20220315

### Scientists Just Created the World's Largest Time Crystal

14 March https://www.popularmechanics.com/science/a39417227/largest-time-crystal

### AI suggested 40,000 new possible chemical weapons in just six hours - The Verge

17 March https://www.theverge.com/2022/3/17/22983197/ai-new-possible-chemical-weapons-generative-models-vx

### Luminous Computing to build the most powerful AI supercomputer with silicon photonics technology - NotebookCheck.net News

11 March Luminous Computing to build the most powerful AI supercomputer with silicon photonics technology -NotebookCheck.net News

### When It Comes to AI, Can We Ditch the Datasets? - Neuroscience News

15 March When It Comes to AI, Can We Ditch the Datasets? - Neuroscience News

### Feature Engineering for Machine Learning (1/3)

14 March Feature Engineering for Machine Learning (1/3) | by Wing Poon | Mar, 2022 | Towards Data Science

### Is Deep Learning a Real Big Thing! Or is it Overhyped Among Users

15 March Is Deep Learning a Real Big Thing! Or is it Overhyped Among Users (analyticsinsight.net)

### How NeuTigers deploys deep learning in edge AI for easy covid detection

15 March How NeuTigers deploys deep learning in edge AI for easy covid detection (analyticsindiamag.com)

#### Mathematical paradoxes demonstrate the limits of AI

17 March https://techxplore.com/news/2022-03-mathematical-paradoxes-limits-ai.html DOI: 10.1073/pnas.2107151119 DOI: 10.1038/d41586-019-03013-5

### AI-Designed Protein Can Awaken Silenced Genes, One by One

24 March <u>AI-Designed Protein Can Awaken Silenced Genes, One by One (scitechdaily.com)</u> DOI: 10.1016/j.celrep.2022.110457

### How to investigate when a robot causes an accident – and why it's important that we

do

24 March How to investigate when a robot causes an accident – and why it's important that we do (theconversation.com)

### 7 Trends in Artificial Intelligence Every Founder Should Pay Attention To | Inc.com

24 March 7 Trends in Artificial Intelligence Every Founder Should Pay Attention To | Inc.com

### AI-Designed Protein Can Awaken Silenced Genes, One by One

24 March <u>AI-Designed Protein Can Awaken Silenced Genes, One by One (scitechdaily.com)</u> <u>DOI: 10.1016/j.celrep.2022.110457</u>

### **Ingenious AI Method Could Find Precious New Rare-Earth Compounds**

23 March https://www.sciencealert.com/ai-is-pointing-the-way-to-finding-new-rare-earth-compounds

### **Researchers develop quantum gate enabling investigation of optimization problems** 25 March

https://phys.org/news/2022-03-quantum-gate-enabling-optimization-problems.html DOI: 10.1103/PhysRevLett.128.120503

### AI paving the way to new rare-earth compounds - Highways Today

27 March https://highways.today/2022/03/27/ai-rare-earth-compounds

### AI proves effective at improving patent office efficiency and application timeliness 23 March

AI proves effective at improving patent office efficiency and application timeliness | CAS

#### New program bolsters innovation in next-generation artificial intelligence hardware | MIT News | Massachusetts Institute of Technology

29 March

 $\underline{https://news.mit.edu/2022/new-program-bolsters-innovation-next-generation-artificial-intelligence-hardware-0329}$ 

### The transformational role of GPU computing and deep learning in drug discovery 23 March

The transformational role of GPU computing and deep learning in drug discovery | Nature Machine Intelligence DOI https://doi.org/10.1038/s42256-022-00463-x
#### The Human Side of Artificial Intelligence - ExtremeTech

1 April https://www.extremetech.com/extreme/333588-the-human-side-of-artificial-intelligence

### Continuous Machine Learning. An Introduction to CML (Iterative.ai) | by Yashaswi Nayak | Mar, 2022 | Towards Data Science

29 March https://towardsdatascience.com/continuous-machine-learning-e1ffb847b8da

### Making the collective knowledge of chemistry open and machine actionable 4 April

Making the collective knowledge of chemistry open and machine actionable | Nature Chemistry DOI https://doi.org/10.1038/s41557-022-00910-7

#### **Optimizing Nanofabrication Processes Through Deep Learning**

29 March <u>Optimizing Nanofabrication Processes Through Deep Learning (azonano.com)</u> <u>https://pubs.acs.org/doi/10.1021/acs.nanolett.1c04604</u>

### Current progress and open challenges for applying deep learning across the biosciences | Nature Communications

1 April https://www.nature.com/articles/s41467-022-29268-7 DOI https://doi.org/10.1038/s41467-022-29268-7

#### Our Human Future in an Age of Artificial Intelligence

7 April Our Human Future in an Age of Artificial Intelligence (scitechdaily.com)

#### **MIT Researchers Propose a New Way To Create Synthesizable Molecules** 7 April

MIT Researchers Propose a New Way To Create Synthesizable Molecules (scitechdaily.com)

### Researchers leverage deep learning to predict physical interactions of protein complexes

18 April Researchers leverage deep learning to predict physical interactions of protein complexes DOI: 10.1038/s41467-022-29394-2

#### DeepMind AI Speeds Up the Time to Determine Proteins' Structures

2 December 2020 DeepMind AI Speeds Up the Time to Determine Proteins' Structures | The Scientist Magazine® (the-scientist.com)

## Beginner's Guide to Machine Learning with Big Data | by Nathaniel DiRenzo | Apr, 2022 | Towards Data Science

12 April

https://towardsdatascience.com/beginners-guide-to-machine-learning-with-big-data-d6dbb155673c

#### Breaking into the black box of artificial intelligence

29 March

Breaking into the black box of artificial intelligence (nature.com) doi: https://doi.org/10.1038/d41586-022-00858-1

### New shape memory alloy discovered through artificial intelligence framework $5\,\mathrm{May}$

https://phys.org/news/2022-05-memory-alloy-artificial-intelligence-framework.html DOI: 10.1016/j.actamat.2022.117751

#### A Smarter Way To Develop New Drugs Using Artificial Intelligence

9 May <u>A Smarter Way To Develop New Drugs Using Artificial Intelligence (scitechdaily.com)</u> arXiv:2110.06389

#### Ireland's first AI Ambassador is announced

10 May https://www.rte.ie/news/technology/2022/0510/1297202-ai-ambassador

#### Euro Convergence: AI, notified body shortage top health authorities session | RAPS

11 May Euro Convergence: AI, notified body shortage top health authorities session | RAPS

#### Yield-predicting AI needs chemists to stop ignoring failed experiments | News | Chemistry World

12 May <u>https://www.chemistryworld.com/news/yield-predicting-ai-needs-chemists-to-stop-ignoring-failed-</u> <u>experiments/4015662.article?utm\_source=cw\_daily\_thu&utm\_medium=email&utm\_campaign=cw\_newsletters</u>

## World's Most Powerful Supercomputer Reveals Carbon-12 Origin Story – A Building Block for Life

19 May World's Most Powerful Supercomputer Reveals Carbon-12 Origin Story – A Building Block for Life (scitechdaily.com) DOI: 10.1038/s41467-022-29582-0

#### AI solves complex physics problems by looking for signs of symmetry

18 May <u>https://www.newscientist.com/article/2320662-ai-solves-complex-physics-problems-by-looking-for-signs-of-symmetry</u>

#### Artificial intelligence is breaking patent law

24 May Artificial intelligence is breaking patent law (nature.com) doi: https://doi.org/10.1038/d41586-022-01391-x

## Artificial intelligence-enhanced quantum chemical method with broad applicability | Nature Communications

2 December 2021 https://www.nature.com/articles/s41467-021-27340-2 DOI https://doi.org/10.1038/s41467-021-27340-2

#### **Quantum Computing & Quantum Computers**

#### **Quantum Computers Getting Smarter at Simulating Chemistry - IEEE Spectrum** 17 March

https://spectrum.ieee.org/quantum-chemistry-largest

#### Characterizing super-semi sandwiches for quantum computing

16 March https://phys.org/news/2022-03-characterizing-super-semi-sandwiches-quantum.html DOI: 10.1103/PhysRevLett.128.107701

#### Toward a quantum computer that calculates molecular energy

16 March https://phys.org/news/2022-03-quantum-molecular-energy.html DOI: 10.1038/s41586-021-04351-z. www.nature.com/articles/s41586-021-04351-z

### Microsoft has demonstrated the underlying physics required to create a new kind of qubit - Microsoft Research

14 March <u>https://www.microsoft.com/en-us/research/blog/microsoft-has-demonstrated-the-underlying-physics-required-to-create-a-new-kind-of-qubit</u>

#### What is a qubit?

? <u>What is a qubit? | Institute for Quantum Computing | University of Waterloo (uwaterloo.ca)</u>

#### What is a qubit?

What is a qubit? (quantum-inspire.com)

#### **Quantum computing: Definition, facts & uses | Live Science**

18 March https://www.livescience.com/quantum-computing

#### What is a quantum computer?

What is a quantum computer? | New Scientist

#### **Explainer: What is a quantum computer?**

29 January 2019 Explainer: What is a quantum computer? | MIT Technology Review

#### How Do Quantum Computers Work?

How Do Quantum Computers Work? (sciencealert.com)

#### How a quantum computer works

24 October 2019 How a quantum computer works | Science | In-depth reporting on science and technology | DW | 24.10.2019

#### How does a quantum computer work?

5 October 2019 How does a quantum computer work? | Inria

#### How Does a Quantum Computer Work? (Video)

7 July 2021 How Does a Quantum Computer Work? - Scientific American

#### How Does a Quantum Computer Work?

17 June 2013 How Does a Quantum Computer Work? - YouTube

#### **Quantum Computers: How They Work and What Can They Do?**

11 September 2021 Quantum Computers: How They Work and What Can They Do? - YouTube

#### **Quantum Computers, Explained With Quantum Physics**

8 June 2021 Quantum Computers, Explained With Quantum Physics - YouTube

#### How to get started in quantum computing

1 March <u>How to get started in quantum computing (nature.com)</u> doi: https://doi.org/10.1038/d41586-021-00533-x

#### Quantum computing is the future... eventually - Ted Talk

October 2018 Jason Ball: Quantum computing is the future... eventually | TED Talk

#### A beginner's guide to quantum computing – TED Women

November 2018 Shohini Ghose: A beginner's guide to quantum computing | TED Talk

## Watch "The Map of Quantum Computing | Quantum Computers Explained" on YouTube

3 December 2021 https://youtu.be/-UlxHPIEVqA

#### Watch "How Quantum Computers Work" on YouTube

1 June 2021 https://youtu.be/3RGEYYJmMtU

#### Microsoft Azure reveals a key breakthrough toward scaling quantum computing

17 March <u>https://interestingengineering.com/microsoft-azure-breakthrough-quantum-computing</u>

#### Google AI Blog: Hybrid Quantum Algorithms for Quantum Monte Carlo

16 March <a href="http://ai.googleblog.com/2022/03/hybrid-quantum-algorithms-for-quantum.html">http://ai.googleblog.com/2022/03/hybrid-quantum-algorithms-for-quantum.html</a>

### Artificial intelligence paves the way to discovering new rare-earth compounds 18 March

https://phys.org/news/2022-03-artificial-intelligence-paves-rare-earth-compounds.html DOI: 10.1016/j.actamat.2022.117759

#### Key Elements Achieved for Fault-Tolerant Quantum Computation in Silicon Spin Qubits

14 March

https://scitechdaily.com/key-elements-achieved-for-fault-tolerant-quantum-computation-in-silicon-spin-qubits DOI: 10.1038/s41586-021-04182-y

#### New Approach Transports Trapped Ions To Create Entangling Gates for Quantum Information Systems

18 March <u>New Approach Transports Trapped Ions To Create Entangling Gates for Quantum Information Systems</u> (scitechdaily.com) <u>DOI: 10.1103/PhysRevLett.128.050502</u>

#### **Quantum computing cybersecurity research gets \$715k grant • The Register** 18 March

https://www.theregister.com/2022/03/18/quantum\_us\_grant

#### Ultracompact meta-imagers for arbitrary all-optical convolution

18 March <u>Ultracompact meta-imagers for arbitrary all-optical convolution | Light: Science & Applications (nature.com)</u> DOI https://doi.org/10.1038/s41377-022-00752-5

## **Google AI Blog: Scaling Up Fundamental Quantum Chemistry Simulations on Quantum Hardware**

27 August 2020 http://ai.googleblog.com/2020/08/scaling-up-fundamental-quantum.html

#### What is Hybrid Quantum Computing?

5 January https://ionq.com/posts/january-05-2022-what-is-hybrid-quantum-computing

#### Tiny magnets could hold the secret to new quantum computers

21 March https://phys.org/news/2022-03-tiny-magnets-secret-quantum.html DOI: 10.1103/PhysRevLett.128.047701 DOI: 10.1103/PhysRevLett.123.107701

#### No free lunch theorem in Quantum Computing

21 March https://analyticsindiamag.com/no-free-lunch-theorem-in-quantum-computing

## A huge leap: Israeli researchers build country's first quantum computer | The Times of Israel

22 March

https://www.timesofisrael.com/a-huge-leap-israeli-researchers-build-countrys-first-quantum-computer

#### Andrew Ng predicts the next 10 years in AI

21 March Andrew Ng predicts the next 10 years in AI | VentureBeat

#### **Steve Blank The Quantum Technology Ecosystem – Explained**

22 March <a href="https://steveblank.com/2022/03/22/the-quantum-technology-ecosystem-explained">https://steveblank.com/2022/03/22/the-quantum-technology-ecosystem-explained</a>

#### Meta's Yann LeCun strives for human-level AI

21 March Meta's Yann LeCun strives for human-level AI | VentureBeat

#### Machine learning-assisted non-destructive plasticizer identification and quantification in historical PVC objects based on IR spectroscopy | Scientific Reports <sup>23</sup> March

https://www.nature.com/articles/s41598-022-08862-1 DOI https://doi.org/10.1038/s41598-022-08862-1

#### **Ingenious AI Method Could Find Precious New Rare-Earth Compounds** 23 March

Ingenious AI Method Could Find Precious New Rare-Earth Compounds (sciencealert.com)

### **Nvidia: 'We are a quantum computing company' - Inside Quantum Technology** 23 March

https://www.insidequantumtechnology.com/news-archive/nvidia-we-are-a-quantum-computing-company

# Using just a laptop, an encryption code designed to prevent a quantum computer attack was cracked in just 53 hours | Science & Tech | EL PAÍS English Edition 24 March

https://english.elpais.com/science-tech/2022-03-24/using-just-a-laptop-an-encryption-code-designed-to-prevent-aguantum-computer-attack-was-cracked-in-just-53-hours.html

#### PRX Quantum 3, 010347 (2022) - Trapped-Ion Quantum Computer with Robust Entangling Gates and Quantum Coherent Feedback

22 March <u>PRX Quantum 3, 010347 (2022) - Trapped-Ion Quantum Computer with Robust Entangling Gates and Quantum</u> <u>Coherent Feedback (aps.org)</u> DOI:https://doi.org/10.1103/PRXQuantum.3.010347

### **Quantum Telecommunications Breakthrough: New world record for qubit storage** 25 March

Quantum Telecommunications Breakthrough: New world record for qubit storage (scitechdaily.com) DOI: 10.1038/s41534-022-00541-3

### Scientists Work To Turn Noise on Quantum Computers to Their Advantage 27 March

Scientists Work To Turn Noise on Quantum Computers to Their Advantage (scitechdaily.com) DOI: 10.1038/s42005-022-00803-8

Autonomous design of new chemical reactions using a variational autoencoder 22 March

<u>Autonomous design of new chemical reactions using a variational autoencoder | Communications Chemistry</u> (nature.com)

DOI https://doi.org/10.1038/s42004-022-00647-x

#### Computational screening methodology identifies effective solvents for CO2 capture

18 March <u>Computational screening methodology identifies effective solvents for CO2 capture | Communications Chemistry</u> (nature.com) DOI https://doi.org/10.1038/s42004-022-00654-y

### Status report on the quantum chemical cluster approach for modelling enzyme reactions

8 March <u>Status report on the quantum chemical cluster approach for modeling enzyme reactions | Communications</u> <u>Chemistry (nature.com)</u> DOI https://doi.org/10.1038/s42004-022-00642-2

### Integration of experimental data and use of automated fitting methods in developing protein force fields

18 March Integration of experimental data and use of automated fitting methods in developing protein force fields | Communications Chemistry (nature.com) DOI <u>https://doi.org/10.1038/s42004-022-00653-z</u>

#### Computational chemistry for all

8 March <u>Computational chemistry for all | Nature Computational Science</u> DOI https://doi.org/10.1038/s43588-022-00209-0

**Qubits made by advanced semiconductor manufacturing** | **Nature Electronics** 29 March

<u>Qubits made by advanced semiconductor manufacturing | Nature Electronics</u> DOI https://doi.org/10.1038/s41928-022-00727-9

#### Producing quantum dots in a regular arrangement

29 March <u>Producing quantum dots in a regular arrangement (innovationnewsnetwork.com)</u>

#### Accenture Bets On Good Chemistry To Drive Quantum Computing

11 April Accenture Bets On Good Chemistry To Drive Quantum Computing | Chemical Processing

#### AI Fuses With Quantum Computing in Promising New Memristor - IEEE Spectrum

13 April AI Fuses With Quantum Computing in Promising New Memristor - IEEE Spectrum

#### Scientists resurrect ancient enzymes to improve photosynthesis

18 April Scientists resurrect ancient enzymes to improve photosynthesis (phys.org) DOI: 10.1126/sciadv.abm6871

### Manufacture-friendly nanostructured metals stabilized by dual-phase honeycomb shell | Nature Communications

19 April https://www.nature.com/articles/s41467-022-29782-8 DOI https://doi.org/10.1038/s41467-022-29782-8

#### Guiding a superconducting future with graphene quantum magic

19 April https://phys.org/news/2022-04-superconducting-future-graphene-quantum-magic.html DOI: 10.1103/PhysRevLett.128.066401

### **Extract from a common kitchen spice could be key to greener, more efficient fuel cells** 18 April

Extract from a common kitchen spice could be key to greener, more efficient fuel cells (phys.org) DOI: 10.1016/j.nanoen.2022.106966

#### The chemical industry may be signaling a recession, says expert

20 April https://finance.yahoo.com/news/this-major-industry-may-be-signaling-a-recession-says-expert-145707451.html

#### Plastics Release Trillions of Nanoparticles When Exposed to Hot Water

21 April <u>Plastics Release Trillions of Nanoparticles When Exposed to Hot Water | Technology Networks</u> doi:10.1021/acs.est.1c06768

#### New Explosive Compound Synthesized From Strange World of High-Pressure Chemistry

21 April <u>New Explosive Compound Synthesized From Strange World of High-Pressure Chemistry (scitechdaily.com)</u> DOI: 10.1038/s41557-022-00925-0

#### Weird World of High-Pressure Chemistry Made Simple by Revision of a Key Chemical Concept

21 April Weird World of High-Pressure Chemistry Made Simple by Revision of a Key Chemical Concept (scitechdaily.com) DOI: 10.1073/pnas.2117416119

#### Scientists Create a New Electronegativity Scale

7 April Scientists Create a New Electronegativity Scale (scitechdaily.com) DOI: 10.1038/s41467-021-22429-0

## Updated Periodic Table: Russian Scientists Propose New Way of Ordering the Elements

29 November 2020

<u>Updated Periodic Table: Russian Scientists Propose New Way of Ordering the Elements (scitechdaily.com)</u> and <u>Nonempirical Definition of the Mendeleev Numbers: Organizing the Chemical Space | The Journal of Physical</u> <u>Chemistry C (acs.org)</u> (paid access)

#### MIT Chemists Devise "Spring-Loaded" System To Pop Phosphorus Into Molecular Rings

21 April

MIT Chemists Devise "Spring-Loaded" System To Pop Phosphorus Into Molecular Rings (scitechdaily.com) DOI: 10.1021/jacs.2c02236

## Photoinduced evolution of lattice orthorhombicity and conceivably enhanced ferromagnetism in LaMnO3 membranes

20 April <u>Photoinduced evolution of lattice orthorhombicity and conceivably enhanced ferromagnetism in LaMnO3</u> <u>membranes | npj Quantum Materials (nature.com)</u> DOI https://doi.org/10.1038/s41535-022-00456-4

#### Can plastic eating super-enzymes solve our destructive plastic problem?

5 March Can plastic eating super-enzymes solve our destructive plastic problem? | CAS

### New insights into the structures and mechanisms of key proteins involved in microbial photosynthesis

15 April New insights into the structures and mechanisms of key proteins involved in microbial photosynthesis (phys.org)

## Hot theory, cool hardware, big progress in quantum computing - Inside The Perimeter

7 December 2020 https://insidetheperimeter.ca/hot-theory-cool-hardware-big-progress-in-quantum-computing

#### Atomic quantum processors make their debut

27 April Atomic quantum processors make their debut – Physics World

#### **Frozen Neon Invention Jolts Quantum Computer Race**

4 May <u>https://spectrum.ieee.org/neon-qubit</u>

### Quantum computers: A new quantum technique could help create planet-sized telescopes

4 May <u>https://interestingengineering.com/quantum-technique-planet-sized-telescopes</u>

### It takes three to tangle: Long-range quantum entanglement needs three-way interaction

6 May

It takes three to tangle: Long-range quantum entanglement needs three-way interaction (phys.org) DOI: 10.1103/PhysRevX.12.021022

**Triplewise information tradeoff in quantum measurement has been proved** 3 May <u>https://phys.org/news/2022-05-triplewise-tradeoff-quantum.html</u> DOI: 10.1103/PhysRevLett.128.050401

#### **Revolutionary New Qubit Platform Could Transform Quantum Computing** 10 May

https://scitechdaily.com/revolutionary-new-qubit-platform-could-transform-quantum-computing DOI: 10.1038/s41586-022-04539-x

#### Peter Shor receives 2022-2023 Killian Award

The MIT professor is honored for extraordinary accomplishments in mathematics, computer science, and quantum physics. 11 May

Peter Shor receives 2022-2023 Killian Award | MIT News | Massachusetts Institute of Technology

#### **Top 18 Research Institutions Leading the Quantum Computing**

16 May

https://thequantuminsider.com/2022/05/16/the-top-18-research-institutions-leading-the-recent-surge-of-quantumcomputing-investigations

#### Steve Blank Artificial Intelligence and Machine Learning- Explained

17 May https://steveblank.com/2022/05/17/artificial-intelligence-and-machine-learning-explained

#### Quantum computing just might save the planet

19 May Ouantum computing just might save the planet | McKinsey

#### Unique Quantum Material Could Enable Incredibly Powerful, Ultra-Compact Computers

21 May

<u>Unique Quantum Material Could Enable Incredibly Powerful, Ultra-Compact Computers (scitechdaily.com)</u> DOI: 10.1038/s41563-022-01245-x

### How quantum computing can help tackle global warming (will revolutionize chemistry)

27 May

How quantum computing can help tackle global warming | McKinsey

#### Nuclear Fusion Power - Saving Angel or Optimistic Dream? & Developments in Nuclear Technology

Regarding concerns about claims made about Nuclear Fusion in New Energy Times a further search revealed some interesting findings. The publication below gives some insights:

### **Modus Operandi of New Energy Times** by Prof Brian Josephson Cavendish, Laboratory, Cambridge.

14 July 2008 & updated 8 March 2012 http://www.tcm.phy.cam.ac.uk/~bdj10/articles/NET1.html

#### About Steven B. Krivit and New Energy Times

Steven B. Krivit and New Energy Times | New Energy Times

#### National Academies calls for a fusion pilot plant

14 April 2021 National Academies calls for a fusion pilot plant - Bulletin of the Atomic Scientists (thebulletin.org)

#### Understanding hot spot conditions reached in implosion experiments

1 March <u>Understanding hot spot conditions reached in implosion experiments (phys.org)</u> DOI: 10.1063/5.0069366

### **Preparing for exascale: Eliminating disruptions on the path to sustainable fusion energy | Argonne National Laboratory**

1 April 2020 <u>Preparing for exascale: Eliminating disruptions on the path to sustainable fusion energy | Argonne National</u> <u>Laboratory (anl.gov)</u>

### Nuclear fusion: why the race to harness the power of the sun just sped up - Revista de Prensa

26 November Nuclear fusion: why the race to harness the power of the sun just sped up - Revista de Prensa (almendron.com)

#### Was 2021 A Breakthrough Year For Fusion Energy?

5 March Was 2021 A Breakthrough Year For Fusion Energy? (forbes.com)

#### **Sunshine** | The long path to discovery

8 March 2021 https://www.iter.org/newsline/-/3570

#### A fusion experiment promised to be the next step in solving humanity's energy crisis. It's a big claim to live up to (with video)

7 May 2021 How close are scientists to developing fusion energy? — WHYY

#### ITER - the way to new energy

14 February https://www.iter.org/whatsnew

#### NASA's New Shortcut to Fusion Power 27 February

NASA's New Shortcut to Fusion Power - IEEE Spectrum

#### \_\_\_\_\_

#### **Issues with Tritium - sub section**

#### **DOE Explains...Deuterium-Tritium Fusion Reactor Fuel**

DOE Explains...Deuterium-Tritium Fusion Reactor Fuel | Department of Energy

FUELLING THE FUSION REACTION

<u>Fuelling the Fusion Reaction (iter.org)</u> and **TRITIUM BREEDING** <u>Tritium Breeding (iter.org)</u>

#### Tritium resources available for fusion reactors

21 December 2017 Tritium resources available for fusion reactors - IOPscience

#### Tritium supply and use: a key issue for the development of nuclear fusion energy

November 2018 <u>Tritium supply and use: a key issue for the development of nuclear fusion energy - ScienceDirect</u> <u>https://doi.org/10.1016/j.fusengdes.2018.04.090</u>

#### **Tritium - Intelligence Resource Program**

November 2011 Tritium (fas.org)

#### Fuel for world's largest fusion reactor ITER is set for test run

22 February 2021 Fuel for world's largest fusion reactor ITER is set for test run (nature.com)

### Fusion Neutrons: Tritium Breeding and Impact on Wall Materials and Components of Diagnostic Systems

1 September 2018 <u>Fusion Neutrons: Tritium Breeding and Impact on Wall Materials and Components of Diagnostic Systems |</u> <u>SpringerLink</u> DOI https://doi.org/10.1007/s10894-018-0182-1

#### **TRITIUM: CHANGING LEAD INTO GOLD**

February 2016 <u>Tritium: Changing lead into gold (iter.org)</u>

#### Tritium: a challenging fuel for fusion

14 November 2017 <u>Tritium: a challenging fuel for fusion – Fusion 4 Freedom</u>

## An overview of the EU breeding blanket design strategy as an integral part of the DEMO design effort

April 2019

An overview of the EU breeding blanket design strategy as an integral part of the DEMO design effort -ScienceDirect https://doi.org/10.1016/j.fusengdes.2019.01.141

#### Lithium World Nuclear Association

October 2017 Lithium - World Nuclear Association (world-nuclear.org)

#### U.S. Tritium Production Timelines (The Lyncean Group of San Diego (Lynceans)

12 January 2020 Nuclear fuel cycle | The Lyncean Group of San Diego (lynceans.org)

#### **Tritium Breeding Strategy forAdvanced Fusion Power Plants**

?

NAS - Tritium Breeding Strategy (nationalacademies.org)

#### The Tritium Fusion Fuel Discrepancy: The Scientific Facts Part 1

10 October 2021 The Tritium Fusion Fuel Discrepancy: The Scientific Facts (newenergytimes.net) The Tritium Fusion Fuel Discrepancy: The Misleading Claims Part 2 10 October 2021 The Tritium Fusion Fuel Discrepancy: The Misleading Claims (newenergytimes.net) Serious Discrepancies with ITER and Nuclear Fusion Part 3 10 October 2021

Serious Discrepancies with ITER and Nuclear Fusion (newenergytimes.net)

### Tritium supply and use: a key issue for the development of nuclear fusion energy – ScienceDirect

November 2018 <u>Tritium supply and use: a key issue for the development of nuclear fusion energy - ScienceDirect</u> <u>https://doi.org/10.1016/j.fusengdes.2018.04.090</u>

#### Fuel for world's largest fusion reactor ITER is set for test run

22 February <u>Fuel for world's largest fusion reactor ITER is set for test run (nature.com)</u> doi: https://doi.org/10.1038/d41586-021-00408-1

#### **Tritium Breeding**

? 2015+ https://www.iter.org/mach/TritiumBreeding

#### The "Blanket" for Tritium Breeding

Blanket (iter.org)

## Fusion Neutrons: Tritium Breeding and Impact on Wall Materials and Components of Diagnostic Systems

1 September 2028 <u>Fusion Neutrons: Tritium Breeding and Impact on Wall Materials and Components of Diagnostic Systems |</u> <u>SpringerLink</u>

#### China launches Iter tritium breeding project

17 March 2021 https://www.world-nuclear-news.org/Articles/China-launches-Iter-tritium-breeding-project

#### **Fast Regression of the Tritium Breeding Ratio in Fusion Reactors**

8 April 2021 [2104.04026] Fast Regression of the Tritium Breeding Ratio in Fusion Reactors (arxiv.org) https://arxiv.org/abs/2104.04026 https://doi.org/10.48550/arXiv.2104.04026 2104.04026.pdf (arxiv.org)

-----

#### A fusion experiment promised to be the next step in solving humanity's energy crisis. It's a big claim to live up to

7 May 2021 How close are scientists to developing fusion energy? — WHYY

### After years of doubts, hopes grow that nuclear fusion is finally for real and could help address climate change

22 December 2021 After years of doubts, hopes grow that nuclear fusion is finally for real and could help address climate change | Devens Community 2022

#### From Artificial Sun To Orbital Bombardment Concept - China Claims 'Big Breakthrough' With Nuclear Fusion Reactor

8 March 2022 https://eurasiantimes.com/hina-claims-big-breakthrough-with-nuclear-fusion-reactor

#### **Understanding Hot-Spot Conditions in National Ignition Facility Implosion Experiments**

8 March Understanding Hot-Spot Conditions in National Ignition Facility Implosion Experiments (scitechdaily.com) DOI: 10.1063/5.0069366

#### How Scientists Achieved Burning Plasma State – After Decades of Fusion Research 8 March How Scientists Achieved Burning Plasma State – After Decades of Fusion Research (scitechdaily.com)

DOI: 10.1038/s41586-021-04281-w

## Thermonuclear Fusion in a Sheared-Flow Z-Pinch: Advancing Another Viable Pathway to Fusion Energy

9 March Physics News - SciTechDaily DOI: 10.1063/5.0066257

#### Fusion reactors: Not what they're cracked up to be

19 April 2017 <u>Fusion reactors: Not what they're cracked up to be - Bulletin of the Atomic Scientists (thebulletin.org)</u> \* \*Bulletin of the Atomic Scientists <u>About Us - Bulletin of the Atomic Scientists (thebulletin.org)</u> **ITEP is a showcase of the drawbacks of fusion operav** 

#### ITER is a showcase ... for the drawbacks of fusion energy

14 February 2018 ITER is a showcase ... for the drawbacks of fusion energy - Bulletin of the Atomic Scientists (thebulletin.org)

#### The ITER Power Amplification Myth

6 October 2017 The ITER 500 Megawatt Power Amplification Myth (newenergytimes.net)

#### A nuclear fusion device pushes plasma to a record-breaking 100 million degrees

11 March

https://interestingengineering.com/nuclear-fusion-plasma-record

#### Nuclear fusion is one step closer with new AI breakthrough

4 March Nuclear fusion is one step closer with new AI breakthrough | Live Science

#### Tokamak Energy achieves temperature threshold for commercial fusion

12 March <a href="https://newatlas.com/energy/tokamak-energy-temperature-threshold-commercial-fusion">https://newatlas.com/energy/tokamak-energy-temperature-threshold-commercial-fusion</a>

#### Marvel Fusion: German start-up aims to generate fusion with lasers

16 March Marvel Fusion: German start-up aims to generate fusion with lasers (cnbc.com)

## **30** years of ASDEX Upgrade – Blueprints for the fusion power plant | Max-Planck-Institut für Plasmaphysik

10 March

<u>30 years of ASDEX Upgrade – Blueprints for the fusion power plant | Max-Planck-Institut für Plasmaphysik (mpg.de)</u>

## Multiscale study of high energy attosecond pulse interaction with matter and application to proton–Boron fusion

18 March <u>Multiscale study of high energy attosecond pulse interaction with matter and application to proton–Boron fusion |</u> <u>Scientific Reports (nature.com)</u> DOI https://doi.org/10.1038/s41598-022-08433-4

### **Nuclear Fusion Research Looks to Secure the Future of Energy - EE Times Europe** 18 March

Nuclear Fusion Research Looks to Secure the Future of Energy - EE Times Europe

#### Finding her way to fusion | MIT News | Massachusetts Institute of Technology

21 March https://news.mit.edu/2022/finding-her-way-fusion-zoe-fisher-0321

#### 3 Advanced Reactor Systems to Watch by 2030 | Department of Energy

12 April 2021 https://www.energy.gov/ne/articles/3-advanced-reactor-systems-watch-2030

#### **Generation IV Designs Improve the Economics of Nuclear Power | Terrestrial Energy** 16 March

https://www.terrestrialenergy.com/2021/03/16/generation-iv-designs-improve-the-economics-of-nuclear-power

#### Will the Ukraine War change Europe's thinking on nuclear?

24 March Will the Ukraine War change Europe's thinking on nuclear? (energymonitor.ai)

### Energy transfer of trapped electron turbulence in tokamak fusion plasmas | Scientific Reports

23 March

Energy transfer of trapped electron turbulence in tokamak fusion plasmas | Scientific Reports (nature.com) DOI https://doi.org/10.1038/s41598-022-08932-4

## Conservative 'nuclear fusion by 2040' pledge is fantasy – their record on climate change is too little, too late

30 March

<u>Conservative 'nuclear fusion by 2040' pledge is fantasy – their record on climate change is too little, too late (theconversation.com)</u>

### **This is when we may finally achieve fusion energy** — a Holy Grail of clean power 1 April

This is when we may finally achieve fusion energy — a Holy Grail of clean power (inverse.com)

#### Molten salt revisited: the CMSR - Nuclear Engineering International

24 January 2022 https://www.neimagazine.com/features/featuremolten-salt-revisited-the-cmsr-9423379

#### Southern Company and TerraPower Prep for Testing on Molten Salt Reactor | Department of Energy

29 November 2021 https://www.energy.gov/ne/articles/southern-company-and-terrapower-prep-testing-molten-salt-reactor

## Nuclear fusion hit a milestone thanks to better reactor walls – this engineering advance is building toward reactors of the future

4 April

https://theconversation.com/nuclear-fusion-hit-a-milestone-thanks-to-better-reactor-walls-this-engineering-advanceis-building-toward-reactors-of-the-future-178870

#### The Dream of Nuclear Fusion Is Now Closer to Reality. Here's Why

5 April

https://www.sciencealert.com/the-dream-of-nuclear-fusion-is-now-closer-to-reality-two-scientists-explainwhy?utm\_source=ScienceAlert+-+Daily+Email+Updates&utm\_campaign=5862cd2573-MAILCHIMP\_EMAIL\_CAMPAIGN&utm\_medium=email&utm\_term=0\_fe5632fb09-5862cd2573-366021682

### Major breakthrough on nuclear fusion energy - Positive News - Positive News 4 April

https://www.positive.news/environment/major-breakthrough-on-nuclear-fusion-energy

### Watch "Nuclear Fusion Illusion. Is it time to park the pipe dream?" on YouTube 20 March 2022

Nuclear Fusion Illusion. Is it time to park the pipe dream? - YouTube

#### Asdex Upgrade: Paving the Way for a Fusion Power Plant

1 April 2021 Asdex Upgrade: Paving the Way for a Fusion Power Plant (scitechdaily.com)

#### How to Armor Future Fusion Reactors to Protect Against One of the Harshest Environments Ever Produced on Earth

30 August 2020 https://scitechdaily.com/how-to-armor-future-fusion-reactors-to-protect-against-one-of-the-harshest-environmentsever-produced-on-earth/amp DOI: 10.1088/1741-4326/ab537b

#### Innovative Solution to Solving a Longstanding Fusion Challenge

12 October 2018 https://scitechdaily.com/innovative-solution-to-solving-a-longstanding-fusion-challenge doi:10.1016/j.fusengdes.2018.09.007

#### What is nuclear fusion | IAEA (nice graphics)

31 March 2022 What is nuclear fusion | IAEA

#### Joint European Torus Reactor - 700 Megawatts Input Power

5 October 2021 https://news.newenergytimes.net/2021/10/05/uncovering-the-700-mw-input-needed-for-the-joint-european-torusreactor

#### **EETimes - First Light Achieves Fusion Energy**

4 July

https://www.eetimes.com/first-light-achieves-fusion-energy

## Finding the questions that guide MIT fusion research | MIT News | Massachusetts Institute of Technology

8 April Finding the questions that guide MIT fusion research | MIT News | Massachusetts Institute of Technology

#### Nuclear Fusion: Challenges Of Building A Fusion Power Plant

17 April 2020 https://www.secretsofuniverse.in/nuclear-fusion-and-fusion-power-plant

### What is Nuclear Fusion? | SHINE's Four-Phase Path to Fusion Energy

https://www.shinefusion.com/nuclear-fusion

## Nuclear fusion: Inside the construction of the world's largest tokamak | BBC Science Focus Magazine

28 March

https://www.sciencefocus.com/future-technology/nuclear-fusion-inside-the-construction-of-the-worlds-largest-tokamak

#### The Spheromak Approach To Fusion • CTFusion • The Impact

5 December 2021 https://readtheimpact.com/the-spheromak-approach-to-fusion-ctfusion

#### Scientists Shatter Record for the Amount of Energy Produced During a Controlled, Sustained Fusion Reaction

14 April Scientists Shatter Record for the Amount of Energy Produced During a Controlled, Sustained Fusion Reaction (scitechdaily.com)

#### Four ways to fusion: The pros and pitfalls of our nuclear power pursuit

3 April 2021 Four ways to fusion: The pros and pitfalls of our nuclear power pursuit (newatlas.com)

#### National Ignition Facility Examines the Performance of Various Materials As Fusion Fuel Ablators

14 April National Ignition Facility Examines the Performance of Various Materials As Fusion Fuel Ablators (scitechdaily.com) DOI: 10.1016/j.hedp.2021.100928

#### **Fusion Fuels – Beyond NERVA**

8 March <u>Fusion Fuels – Beyond NERVA</u>

#### **Generation IV, the future of nuclear power** 15 April

Generation IV, the future of nuclear power (newatlas.com)

## Roles of resonant muonic molecule in new kinetics model and muon catalysed fusion in compressed gas | Scientific Reports

16 April https://www.nature.com/articles/s41598-022-09487-0 DOI https://doi.org/10.1038/s41598-022-09487-0

#### Polarized fuel: A new option for sustained nuclear fusion - Research Outreach

18 November 2021 <u>Polarized fuel: A new option for sustained nuclear fusion - Research Outreach</u> DOI: <u>10.32907/RO-126-1918001166</u>

#### **Fusion Ignition – Beyond NERVA**

7 February Fusion Ignition – Beyond NERVA

## **Disruptions From the International Thermonuclear Experimental Reactor Can Now Be Countered 10 Times Faster**

24 April Disruptions From the International Thermonuclear Experimental Reactor Can Now Be Countered 10 Times Faster (scitechdaily.com) DOI: 10.1088/1741-4326/ac233b

#### **Princeton Physicists Unravel a Puzzle To Speed Fusion Energy Development** 25 April <u>Princeton Physicists Unravel a Puzzle To Speed Fusion Energy Development (scitechdaily.com)</u> DOI: 10.1016/j.jcp.2021.110767

Validating Models for Next-Generation Fusion Power Plants 25 April

Validating Models for Next-Generation Fusion Power Plants (scitechdaily.com) DOI: 10.1088/1741-4326/ac5448

### New "Electromagnets" Could Facilitate Development of Fusion and Medical Technologies

26 April New "Electromagnets" Could Facilitate Development of Fusion and Medical Technologies (scitechdaily.com) DOI: 10.1088/1361-6668/ac1d95

#### One Thing the WaPo's Op-ed on Nuclear Safety Wasn't Built to Survive: Scrutiny A rebuttal to Washington Post op-ed on wartime nuclear power plant safety 25 March

One Thing the WaPo's Op-ed on Nuclear... | The Breakthrough Institute

#### Stronger Nuclear Fusion Materials May Be Possible Thanks to Photos of a Tiny Aluminum Crystal

29 April https://scitechdaily.com/stronger-nuclear-fusion-materials-may-be-possible-thanks-to-photos-of-a-tiny-aluminumcrystal DOI: 10.1038/s41467-022-28684-z

**Nuclear Energy - Good but not the silver bullet we were hoping for – LessWrong** 30 April

Nuclear Energy - Good but not the silver bullet we were hoping for - LessWrong

## Researchers design simpler magnets for twisty facilities that could lead to steady-state fusion operation

28 April Researchers design simpler magnets for twisty facilities that could lead to steady-state fusion operation (phys.org) DOI: 10.1088/1741-4326/ac2ff3

## **Realizing the STEP fusion dream will require cryogenic innovation at scale and at pace – Physics World**

2 May Realizing the STEP fusion dream will require cryogenic innovation at scale and at pace – Physics World

## Fusion energy: MIT joins a major startup backed by Bill Gates to build a viable fusion machine

11 May https://interestingengineering.com/mit-bill-gates-build-fusion-machine

#### Unusual quantum state of matter observed for the first time

11 May Unusual quantum state of matter observed for the first time (phys.org)

#### DOI: 10.1103/PhysRevX.12.021015

#### **DeepMind Trains AI Controller for Nuclear Fusion Research Device** 10 May https://www.infoq.com/news/2022/05/deepmind-fusion-control

A new law unchains fusion energy 17 May A new law unchains fusion energy (phys.org) DOI: 10.1103/PhysRevLett.128.185003

### Preliminary assessment of the safety factors in K-DEMO for fusion compatible regulatory framework | Scientific Reports

18 May https://www.nature.com/articles/s41598-022-12389-w DOI https://doi.org/10.1038/s41598-022-12389-w

#### Fusion experts tackle cooling strategies for fusion fuel cycle

25 May Fusion experts tackle cooling strategies for fusion fuel cycle (phys.org)

# **Small (Modular) Nuclear Reactors & New Technology for Conventional Fission Reactors**

### Ukraine nuclear power plant attack: scientists assess the risks 4 March

<u>Ukraine nuclear power plant attack: scientists assess the risks (nature.com)</u> doi: https://doi.org/10.1038/d41586-022-00660-z

### Ukraine war: the dangers following Russia's attack on the Zaporizhzhia nuclear power plant

4 March

Ukraine war: the dangers following Russia's attack on the Zaporizhzhia nuclear power plant (theconversation.com)

## The sustainability of nuclear power and the critical importance of independent research | Behavioural and Social Sciences at Nature Portfolio

5 October 2020

The sustainability of nuclear power and the critical importance of independent research | Behavioural and Social Sciences at Nature Portfolio

### Indian test reactor reaches operation landmark : New Nuclear - World Nuclear News 8 March

https://world-nuclear-news.org/Articles/Indian-test-reactor-reaches-operation-landmark

## Chernobyl and Zaporizhzhia power cuts: nervous wait as Ukraine nuclear power plants could start leaking radiation

10 March Chernobyl and Zaporizhzhia power cuts: nervous wait as Ukraine nuclear power plants could start leaking radiation (theconversation.com)

#### Neutron Energy (Types of Neutrons in Nuclear Energy)

? Neutron Energy | Classification of Neutrons | nuclear-power.com

#### Slow and fast neutrons

Radioactivity : Slow and fast neutrons

#### **Nuclear Reactor Types**

? nuclear\_reactors.pdf (stanford.edu)

#### **Advanced Nuclear Reactors 101**

. Advanced Nuclear Reactors 101 (rff.org)

## **Bill Gates' TerraPower wins \$8.5M in federal funding for conversion of used nuclear fuel**

10 March Bill Gates' TerraPower wins \$8.5M in federal funding for conversion of used nuclear fuel (yahoo.com)

#### -----

#### Sub Section Fission Power Reactors

#### 3 Advanced Reactor Systems to Watch by 2030

12 April 2021 3 Advanced Reactor Systems to Watch by 2030 | Department of Energy

#### 5 Advanced Reactor Designs to Watch in 2030 | Department of Energy

17 March 2021 https://www.energy.gov/ne/articles/5-advanced-reactor-designs-watch-2030

### Advanced Nuclear Power Reactors | Generation III+ Nuclear Reactors - World Nuclear Association

April 2021 https://world-nuclear.org/information-library/nuclear-fuel-cycle/nuclear-power-reactors/advanced-nuclear-power-reactors.aspx

#### Generation IV Nuclear Reactors: WNA - World Nuclear Association

December 2020 https://world-nuclear.org/information-library/nuclear-fuel-cycle/nuclear-power-reactors/generation-iv-nuclear-reactors.aspx

#### **Generation IV Reactors (pdf)**

2 November 2016 <u>GenIV-IOP-Nov16-static</u> https://www.iop.org/sites/default/files/2019-06/generation-iv-reactors.pdf

#### 3 Advanced Reactor Systems to Watch by 2030 | Department of Energy

12 April 2021 3 Advanced Reactor Systems to Watch by 2030 | Department of Energy

#### A Technology Roadmap for Generation IV Nuclear Energy Systems

November 2002 <u>Microsoft PowerPoint - 2-2 (oecd-nea.org)</u> and **THE GENERATION IV NUCLEAR ENERGY SYSTEMS TECHNOLOGY ROADMAP** <u>Microsoft Word - 2-2-doc.doc (oecd-nea.org)</u>

#### Technology Roadmap Update for Generation IV Nuclear Energy Systems

January 2014 <u>Technology Roadmap Update for Generation IV Nuclear Energy Systems (gen-4.org)</u>

#### **Energy Saver: Could Chemical Plants Go Nuclear?**

21 March Energy Saver: Could Chemical Plants Go Nuclear? | Chemical Processing

#### **China Starts Up First Fourth-Generation Nuclear Reactor**

1 March China Starts Up First Fourth-Generation Nuclear Reactor (powermag.com)

#### IRISH CHEMICAL NEWS ISSUE NO.2 MAY/ JUNE 2022

### Nuclear power: Why molten salt reactors are problematic and Canada investing in them is a waste

14 September 2021 https://theconversation.com/nuclear-power-why-molten-salt-reactors-are-problematic-and-canada-investing-inthem-is-a-waste-167019

#### **Reactors worth their salt**

2 March 2021 Reactors worth their salt (powerengineeringint.com)

#### The "other" nuclears: the molten salt reactor - The Voices of Nuclear

5 May 2021 https://www.voicesofnuclear.org/the-other-nuclear-the-molten-salt-reactor

#### Nuclear cleanup

18 January 2022 https://www.neimagazine.com/features/featuresodium-success-story-at-dounreays-pfr-9408761

#### Watch "We Went Inside the Largest Nuclear Fusion Reactor" on YouTube

13 April 2022 We Went Inside the Largest Nuclear Fusion Reactor - YouTube

### **Generation IV Designs Improve the Economics of Nuclear Power | Terrestrial Energy** (Integral Molten Salt Reactor®)

16 March 2021 <u>Generation IV Designs Improve the Economics of Nuclear Power | Terrestrial Energy</u> and **HOW IT WORKS** <u>How Do Molten Salt Reactors Work? | Inside IMSR Technology (terrestrialenergy.com)</u> and https://www.terrestrialenergy.com/technology

#### **Molten Salt Reactor Fundamentals**

15 October 2018 Molten Salt Reactor Fundamentals - YouTube

#### 1. What is a thorium Molten Salt Reactor?

? Molten Salt Reactor FAQ - Ensuring Nuclear Performance

#### Spotlight on Innovation: Molten Salt Reactors for a Sustainable Clean Energy Transition 24 August 2020 Spotlight on Innovation: Molten Salt Reactors for a Sustainable Clean Energy Transition | IAEA

#### Molten Salt Reactors

May 2021 Molten Salt Reactors - World Nuclear Association (world-nuclear.org)

#### **Reactors of the Future (Generation IV)**

14 May 2019 Reactors of the Future (Generation IV) - YouTube

#### **Nuclear Energy Agency (NEA) - Policy perspectives on nuclear fuel cycle technologies** 26 February 2021

Nuclear Energy Agency (NEA) - Policy perspectives on nuclear fuel cycle technologies (oecd-nea.org)

#### Molten salt revisited: the CMSR - Nuclear Engineering International

24 January 2022 https://www.neimagazine.com/features/featuremolten-salt-revisited-the-cmsr-9423379

#### Southern Company and TerraPower Prep for Testing on Molten Salt Reactor

29 November 2021 Southern Company and TerraPower Prep for Testing on Molten Salt Reactor | Department of Energy

### A first for Canada: New type of nuclear plant opening by 2028 - The Weather Network

30 April <u>A first for Canada: New type of nuclear plant opening by 2028 - The Weather Network</u>

#### Liquid fluoride thorium reactor

Liquid fluoride thorium reactor - Wikipedia https://en.wikipedia.org/wiki/Liquid\_fluoride\_thorium\_reactor

### **Small Modular Reactors Provide Opportunity to Rethink Automation for Nuclear Generation**

2 May <u>https://www.powermag.com/small-modular-reactors-provide-opportunity-to-rethink-automation-for-nuclear-generation</u>

#### The future of nuclear waste: what's the plan and can it be safe?

9 May The future of nuclear waste: what's the plan and can it be safe? (theconversation.com)

### Scientists Discover Unexplained Abundance of Rare Nuclear Fusion Fuel on Earth 9 May

Scientists Discover Unexplained Abundance of Rare Nuclear Fusion Fuel on Earth (vice.com)

### First tests under way at new US liquid metal facility : New Nuclear - World Nuclear News

12 May

First tests under way at new US liquid metal facility : New Nuclear - World Nuclear News (world-nuclearnews.org)

## Final environmental impact statement for US Versatile Test Reactor : New Nuclear - World Nuclear News

16 May

https://www.world-nuclear-news.org/Articles/Final-environmental-impact-statement-for-US-Versat

## Kazakh research reactor restarts after conversion to LEU : Uranium & Fuel - World Nuclear News

11 May

https://www.world-nuclear-news.org/Articles/Kazakh-research-reactor-restarts-after-conversion

#### **Russians Achieve Milestone with New Nuclear Fuel**

19 May Russians Achieve Milestone with New Nuclear Fuel (powermag.com)

#### Nuclearelectrica and NuScale sign MoU, site chosen for SMR

24 May <u>Nuclearelectrica and NuScale sign MoU, site chosen for SMR : New Nuclear - World Nuclear News (world-nuclear-news.org)</u>

#### Belgium government allocates funding for SMR research

24 May Belgium government allocates funding for SMR research : New Nuclear - World Nuclear News (world-nuclearnews.org)

### **Electricity markets with high shares of Wind and Solar will need Nuclear** 24 May

Electricity markets with high shares of Wind and Solar will need Nuclear - Energy Post

### Nuclear Fusion Can Unleash Even More Power Than We Realized, Scientists Say 26 May

Nuclear Fusion Can Unleash Even More Power Than We Realized, Scientists Say (sciencealert.com)

### **3** Early-Stage R&D Programs Transforming the Nuclear Industry | Department of Energy

24 May https://www.energy.gov/ne/articles/3-early-stage-rd-programs-transforming-nuclear-industry

### Bottling the sun: The world has been trying to master this limitless clean energy source since the 1930s. We're now closer than ever

30 May

https://edition.cnn.com/interactive/2022/05/world/iter-nuclear-fusion-climate-intl-cnnphotos

#### **Thorium Power Reactors**

#### Watch "Thorium and the Future of Nuclear Energy" on YouTube

1 July 2019 https://youtu.be/ElulEJruhRQ

#### Thorium explained - the future of cheap, clean energy?

9 June 2020 Thorium explained - the future of cheap, clean energy? - YouTube

#### **Thorium - Periodic Table of Videos - Prof Poliakoff**

21 March 2016 Thorium - Periodic Table of Videos - YouTube

#### Thorium Summary - "Th" Documentary

30 July 2013 Thorium Summary - "Th" Documentary - YouTube

#### Is Thorium Our Energy Future? | Answers With Joe

12 February 2018 Is Thorium Our Energy Future? | Answers With Joe - YouTube

**Thorium Disadvantages** 6 August 2017 Thorium Disadvantages - YouTube

#### Thorium vs Uranium

30 March 2015 Thorium vs Uranium - YouTube

#### **Thorium Reactors: Fact and Fiction**

4 May 2018 <u>Thorium Reactors: Fact and Fiction - YouTube</u>

### China's Molten Salt Reactor Program and the Thorium Fuel Cycle/U233 | Rock Logic | Ep 31

15 November 2021 China's Molten Salt Reactor Program and the Thorium Fuel Cycle/U233 | Rock Logic | Ep 31 - YouTube

#### China prepares to test thorium-fuelled nuclear reactor

9 September 2021 https://www.nature.com/articles/d41586-021-02459-w doi: https://doi.org/10.1038/d41586-021-02459-w

#### **China Says It's Closing in on Thorium Nuclear Reactor - IEEE Spectrum** 4 August 2021

China Says It's Closing in on Thorium Nuclear Reactor - IEEE Spectrum

#### Why China is developing a game-changing thorium-fuelled nuclear reactor

12 September 2021

https://www.france24.com/en/asia-pacific/20210912-why-china-is-developing-a-game-changing-thorium-fuelled-nuclear-reactor

#### China shows us the path to the nuclear future

12 October 2021 China shows us the path to the nuclear future (europeanscientist.com)

#### From History to Reactor - THORIUM 232

15 October 2019 From History to Reactor - THORIUM 232 - YouTube

Watch "Revisiting Thorium Energy - The Future of Nuclear Power?" on YouTube 8 February 2022

Revisiting Thorium Energy - The Future of Nuclear Power? - YouTube

#### 1. What is a thorium Molten Salt Reactor?

? Molten Salt Reactor FAQ - Ensuring Nuclear Performance

### Molten Salt Reactor (Thorium fuel) Ship Thor Breaks the Norm With Incredible Capabilities – autoevolution

1 May Molten Salt Reactor Ship Thor Breaks the Norm With Incredible Capabilities - autoevolution

#### **Overview: The Thorium Molten Salt Reactor**

? 2014 Overview: The Thorium Molten Salt Reactor – Thorium MSR Foundation (thmsr.com)

#### A Thorium Molten Salt Reactor When and Where You Need It

1 May 2019 <u>A Thorium Molten Salt Reactor When and Where You Need It (powermag.com)</u>

#### Why China is developing a game-changing thorium-fuelled nuclear reactor

12 September 2021 Why China is developing a game-changing thorium-fuelled nuclear reactor (france24.com)

#### Thorium fuel cycle

18 September 2015 <u>Thorium fuel cycle - Energy Education</u>

#### Thorium fuel cycle

Thorium fuel cycle - Wikipedia

#### Thorium fuel cycle — Potential benefits and challenges

May 2005 <u>IAEA-TECDOC-1450</u> https://www-pub.iaea.org/mtcd/publications/pdf/te\_1450\_web.pdf

#### Comparison of thorium and uranium fuel cycles

March 2012 6300-comparison-fuel-cycles.pdf (publishing.service.gov.uk)

#### The Thorium Fuel Cycle ThEC13 Daniel Mathers (PowerPoint presentation) PowerPoint Presentation (cern.ch)

#### Revisiting the thorium-uranium nuclear fuel cycle 2007

Revisiting the thorium-uranium nuclear fuel cycle (europhysicsnews.org) DOI: 10.1051/EPN:2007007

#### Full article: Safe, clean, proliferation resistant and cost-effective Thorium-based Molten Salt Reactors for sustainable development

5 May https://www.tandfonline.com/doi/full/10.1080/14786451.2021.1928130 https://doi.org/10.1080/14786451.2021.1928130

#### Are Thorium Reactors the Future of Nuclear Energy? | INN

20 January 2022 Are Thorium Reactors the Future of Nuclear Energy? | INN (investingnews.com)

#### **Hydrogen-Boron 11 Fusion Power Reactors**

### HB11's hydrogen-boron laser fusion test yields ground breaking results 28 March

HB11's hydrogen-boron laser fusion test yields groundbreaking results (newatlas.com)

#### Radical hydrogen-boron reactor leapfrogs current nuclear fusion tech

21 February 2020 Radical hydrogen-boron reactor leapfrogs current nuclear fusion tech (newatlas.com)

#### Most complex lift to date completed at ITER : New Nuclear - World Nuclear News

13 May https://world-nuclear-news.org/Articles/Most-complex-lift-to-date-completed-at-ITER

#### Low Energy Nuclear Reactions

Whether Cold Fusion or Low-Energy Nuclear Reactions, U.S. Navy Researchers Reopen Case. Spurred on by continued anomalous nuclear results, multiple labs now working to get to bottom of story 22 March 2021

Whether Cold Fusion or Low-Energy Nuclear Reactions, U.S. Navy Researchers Reopen Case - IEEE Spectrum

#### **Experimental Status of LENR**

21-22 October 2021 <u>PowerPoint Presentation (energy.gov)</u> or https://arpa-e.energy.gov/sites/default/files/2021LENR\_workshop\_Nagel.pdf and Low-Energy Nuclear Reactions Workshop October 21-22, 2021 <u>Workshop | arpa-e.energy.gov</u>

#### **But:**

**Google revives controversial cold-fusion experiments** 28 May 2019 <u>Google revives controversial cold-fusion experiments (nature.com)</u>

### The Present Status of Cold Fusion and its Expected Influence on Science and Technology

8 January 2015 The Present Status of Cold Fusion and its Expected Influence on Science and Technology (omicsonline.org)

#### **Cold Fusion Lives: Experiments Create Energy When None Should Exist**

28 November 2016 Cold Fusion Lives: Experiments Create Energy When None Should Exist - Scientific American

#### **Briefing on Low-Energy Nuclear Reactions (LENR) Research**

4 May 2016 https://www.esd.whs.mil/Portals/54/Documents/FOID/Reading%20Room/Science\_and\_Technology/16-F-1333\_%20DOC\_02\_LENR\_Briefing.pdf or untitled (whs.mil)

### Preliminary survey on cold fusion: It's not pathological science and may require revision of nuclear theory

15 December 2021 Preliminary survey on cold fusion: It's not pathological science and may require revision of nuclear theory -<u>ScienceDirect</u> <u>https://doi.org/10.1016/j.jelechem.2021.115871</u>

#### **Risk and Scientific Reputation: Lessons from Cold Fusion**

10 January 2022 Download citation of Risk and Scientific Reputation: Lessons from Cold Fusion (researchgate.net)

#### SFI Updates & Reports



#### €9 million joint investment announced for US-Ireland Research Programme



Dr Rebecca Rolfe, Research Fellow, Prof Paula Murphy (PI) and Natalie Jablonski, visiting student, are members of the TCD based project team working on a US-Ireland award titled 'Design of Genetically Engineered Tensile Load-Bearing Soft Tissues Inspired by Embryonic Tendon Development'.

**Dublin, Ireland, 14th March 2022**: A joint investment of €9 million was today announced through a tripartite research and development partnership between the United States of America (USA), Republic of Ireland (RoI) and Northern Ireland (NI), spanning 16 research institutions. The seven awards will support more than 14 research positions in the Republic of Ireland and 10 research positions in Northern Ireland for three to five years.

The research projects receiving funding are in the areas of energy and sustainability, telecommunications and quantum networks, nanomaterials, optics and photonics; tissue engineering for tendon reconstruction; and sensor monitoring for water quality and peatlands.

The funding agencies involved in the awards being announced today are Science Foundation Ireland (SFI) in the Republic of Ireland; the National Science Foundation (NSF) in the USA, and the Department for the Economy (DfE) in Northern Ireland. The Health Research Board (ROI), the Health & Social Care R&D Division (NI) and National Institutes of Health (USA) have also been cofounding partners in the programme.

**Prof Philip Nolan, Director General of Science Foundation Ireland** welcomed the announcement, saying: "I am delighted to congratulate all of the award recipients and their collaborators. These are world-class research projects, driving innovation with the potential to greatly benefit our

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collective societies and economies. The <u>US-Ireland R&D Partnership Programme</u> demonstrates the strong collaborative relationship between our countries, encouraging globally-relevant scientific discovery across borders."

Also welcoming the announcement, **Dr Sethuraman Panchanathan, Director of the US National Science Foundation**, said: "The <u>US-Ireland R&D Partnership Programme</u> provides a unique opportunity to advance research on a global scale. I am delighted to congratulate the awardees collaborating across the Atlantic, who are working to create future world-class technological innovations."

The overall goal of the US-Ireland Research and Development Partnership, launched in July 2006, is to increase the level of collaborative R&D amongst researchers and industry professionals across the three jurisdictions. This unique collaboration aims to generate valuable discoveries and innovations which are transferable to the marketplace, or will lead to enhancements in health, disease prevention or healthcare.

#### Trevor Cooper, Director of Higher Education in the Department for the Economy (Northern

**Ireland**) said: "The US-Ireland R&D Partnership is playing a key role in driving forward Northern Ireland's economic vision for a '10x Economy' which champions greater collaboration and innovation to deliver a ten times better economy with benefits for all our people. '10x Economy' recognises that international collaboration is a key feature of the Northern Ireland research landscape and fundamental to driving both economic impact and social advancement. This flagship trans-Atlantic partnership is crucial to delivering this vision."

The 16 collaborating institutions are University College Dublin (UCD), Trinity College Dublin (TCD), National University of Ireland Galway (NUIG), Munster Technological University (MTU), Tyndall National institute (TNI), and Dublin City University (DCU) in the Republic of Ireland; Queen's University Belfast (QUB) and Ulster University (UU) in Northern Ireland; and University of Pennsylvania, Virginia Tech, University of Colorado Boulder, Arizona State University, Harvard University, Pennsylvania State University, Ohio State University, and Rensselaer Polytechnic University in the United States.

#### View full list of awards

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# Tánaiste Leo Varadkar launches €10 million 'precision medicine' collaborative research programme

Precision ALS will combine applied clinical research with cutting-edge data science to realise the power of AI towards new drug development in Motor Neuron Disease.



Tánaiste and Minister for Enterprise, Trade and Employment Leo Varadkar TD, Prof Orla Hardiman, Director of the Precision ALS research programme and Professor of Neurology at Trinity College Dublin, Prof Vinny Wade, Director of ADAPT, Prof Linda Doyle, Trinity College Dublin Provost, Prof Philip Nolan, Director General of SFI and Prof David Henshall, Director of FutureNeuro

**Dublin, 1st March 2022:** An ambitious academic, clinical and industry research programme that will provide new insights in our understanding of Motor Neuron Disease (MND), also known as Amyotrophic Lateral Sclerosis (ALS), was launched today by Tánaiste and Minister for Enterprise, Trade and Employment, Leo Varadkar TD. The research is supported by the Irish Government through a Science Foundation Ireland investment of  $\in$ 5 million which will be leveraged with an additional  $\in$ 5 million from industry partners.

Precision ALS, which is led by two SFI Research Centres - ADAPT and FutureNeuro - involves world class Irish-based researchers in clinical science, data science and artificial intelligence (AI). The researchers will work in partnership with TRICALS, an independent consortium of leading ALS experts, patients and patient advocacy groups across Europe.

Speaking at the launch, **Tánaiste and Minister for Enterprise, Trade and Employment, Leo Varadkar TD** said: "This project straddles clinical research and industry, and will combine the best of our technologies, the best of our ideas, and the best of our medical expertise with to potential to change lives for the better. It will develop tools that facilitate clinical trials based on precision-medicine, and has the potential to produce benefits for other rare conditions and diseases, supporting job creation and reducing drug costs."

The programme, which will advance data-driven prediction models for progression of the disease in patients and next-generation data analysis that facilitates clinical insights and treatment, will include the participation of national and international industry partners, charities and patient organisations.

#### Simon Harris TD Minister for Further and Higher Education, Research, Innovation and

**Science** welcomed the announcement, saying: "The Covid-19 pandemic has taught us the value of research and the difference it can make to people's lives. This is a perfect example of the impact research and innovation can have. By supporting and harnessing these types of advanced research projects we will ultimately see the benefits across society."

Speaking at the launch, **Professor Philip Nolan, Director General of SFI** said: "The SFI Research Centres were developed to create critical mass of excellent research in areas of national importance, and to ensure this research has tangible benefits for our health, our society and our economy through collaboration between academia, Government and industry across the island of Ireland and internationally. I am delighted to welcome the launch of Precision ALS, which will deliver outstanding science in the area of personalised and precision medicine, focused on neurodegenerative disease. This collaboration will directly benefit healthcare and patient communities, and yield new knowledge, approaches and treatments with the potential to improve the lives of many."

Precision ALS will provide an innovative and interactive platform for all clinical research in ALS across Europe, that will then harness AI to analyse large amounts of data. As the largest international multimodal dataset aimed at precision medicine for this condition, Precision ALS will address the issues with gathering new data at scale in a timely and cost effective-manner across multiple international sites in order to present that data in real time to clinical scientists.

**Director of the Precision ALS research programme and Professor of Neurology at Trinity College Dublin, Professor Orla Hardiman** said: "Despite significant advances in pre-clinical models that help us understand the biology of disease in animals, the success of clinical trials has been disappointing. ALS is a disease that only affects humans, and there is increasing recognition of the need for a Precision Medicine approach towards drug development. We know now that ALS is heterogeneous, meaning that it has different causes and different patterns of progression. Large numbers are required to understand these differences. Using "big data" analyses, Precision ALS will provide an in-depth understanding of the factors that drive heterogeneity, and in doing so will for the first time allow us to target new and innovative treatments to specific patient subgroups."

Precision ALS is a unique programme that brings together Clinicians, Computer Scientists, Information Engineers, Technologists, and Data Scientists. The researchers will work together with leading pharmaceutical, data science, clinical research, medical device organisations and the HSE to generate a sustainable precision medicine-based approach towards new drug development that will have many benefits including better clinical outcomes for patients and reducing the economic cost of these diseases.

On completion, Precision ALS will be a first-in-kind modular transferable pan-European ICT framework for ALS that can be easily adapted to other diseases that face similar precision medicine-related challenges.

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IRISH CHEMICAL NEWS ISSUE NO.2 MAY/ JUNE 2022



e-Alert: February 2022

### SFI Industry RD&I Fellowship

SFI is pleased to launch the <u>SFI Industry RD&I Fellowship 2022 Call</u>. This programme supports academic partnerships with industry. Grants can be awarded to academic researchers wishing to spend time in industry to support industry-informed research and the exchange of knowledge and expertise between academia and industry.

This programme will operate through a single call for proposals with **two** submission deadlines. The first submission deadline (Call A) is **18th May 2022** at 13:00 (Dublin local time). The second submission deadline (Call B) is **19th October 2022** at 13:00 (Dublin local time).

An information webinar will be held on **9th March 2022** at 11am. To register for the webinar and for full information of the programme and the 2022 Call please visit link below:

#### SFI Industry RD&I Fellowship Programme

SFI Industry RD&I Fellowship Programme

**Contact Us** 

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e-Alert: March 2022

# SFI Discover Programme Science Week Call 2022

Science Foundation Ireland is pleased to launch the **SFI Discover Programme Science Week** Call 2022. The purpose of this call is to provide support to festivals and events nationwide that encourage people, in particular those underrepresented in STEM, or those with less access to STEM, to engage in ways that are relevant and accessible during **Science Week 2022** and beyond.

For more information and to apply, please visit:

Science Week Call 2022

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IRISH CHEMICAL NEWS ISSUE NO.2 MAY/ JUNE 2022


# Minister Harris announces 27 grants worth €2.1m for academic and industry collaborations

Companies to benefit from expertise of research fellows in areas such as virtual reality, chatbots, biotechnology, coastal erosion and breast cancer

**1st April 2022:** Minister for Further and Higher Education, Research, Innovation and Science Simon Harris TD has today announced 27 new academic and industry research collaborations on behalf of Science Foundation Ireland, valued at  $\notin 2.1$  million.

The SFI Industry RD&I Fellowship Programme will support the temporary placement of academic researchers in 19 companies to undertake research projects across a variety of areas including microbiology, virtual reality (VR), chatbots optimisation, biotechnology, coastal erosion, breast cancer, photodynamic therapy and more. The industry partners on these awards will provide co-funding with a combined value of €1.9 million.

**Minister for Further and Higher Education, Research, Innovation and Science, Simon Harris, TD**, said: "I'm delighted to welcome this Fellowship programme bringing together academic researchers and industry partners, to undertake collaborative research that will see them mutually benefit from each other's invaluable knowledge and expertise. I want to commend Science Foundation Ireland for announcing this funding which will be important in developing some exciting research projects."

**Prof Philip Nolan, Director General SFI**, said: "We are delighted to offer this new Fellowship programme to academic researchers looking to apply their knowledge in industry. At SFI, we are keen to be part of a framework that can enable researchers to seek and secure diverse career opportunities in areas such as industry, research funding and administration and Government affairs. The applications to the programme have been incredibly strong and we are pleased to see such a high-calibre of projects coming to life."

Those who are awarded Fellowships can take them on a full-time basis between one and 12 months or on a part-time basis, between 2 and 24 months. The maximum award amount funded by SFI is  $\in$ 100,000. The programme was supported by IDA Ireland who see it as an enabler to innovation for their client companies.

The Fellowship programme is designed to help kick-start postdoctoral academic researchers' careers in industry and to maximise the impact of their training. The programme also supports academic faculty researchers who want to spend time in industry alongside their academic responsibilities. Simultaneously, the placement will allow industry partners to benefit from their research fellows' knowledge to collaborate on bringing innovative solutions to industry challenges.

Applications for the 2022 SFI Industry RD&I Fellowship call are now open with two submission deadlines. The first submission deadline is on 18 May 2022; the second submission deadline is on 19 October 2022.

Academics and Industry partners awarded funding

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## UCC's Professor Barry O'Sullivan announced as a Fellow of the Association for the Advancement of Artificial Intelligence – and the first ever elected from an Irish University



**22 April 2022:** Each year, the Association for the Advancement of Artificial Intelligence (AAAI) recognizes a small number of fellows for their unusual distinction in the profession and for their sustained contributions to the field for a decade or more. This year, AAAI is pleased to honour 10 scientists as the 2022 AAAI Fellows.

A Fellow may be recognized for individual technical contributions or for

having performed significant extended service for the AAAI. Evidence of technical contribution will often be in the form of technical results and publications, but other evidence will also be considered, such as patent awards or statements of longstanding contribution to an industrial group effort.

**UCC's Professor Barry O'Sullivan, Chair of Constraint Programming at the School of Computer Science and Information Technology**, who is also the founding director of both the Insight SFI Research Centre for Data Analytics at UCC and the SFI Centre for Research Training in Artificial Intelligence, has been elected a Fellow of AAAI this year. This is the first time that someone based at an Irish university has been recognised in this way. Professor O'Sullivan has been recognised for his contributions to the field of constraint programming and his leadership within the AI community.

Responding to the announcement, **Professor O'Sullivan** said: "I am honoured to receive this recognition and become a Fellow of AAAI which has been a life-time ambition of mine. I owe huge thanks to all my colleagues and students at Insight, my collaborators at home and abroad, and especially my family. I would like to especially recognise the mentorship of Professor Eugene Freuder over the years. It has been an honour to contribute to the field of artificial intelligence over the last two decades."

In congratulating Professor Barry O'Sullivan on this prestigious award, **UCC President, John O'Halloran**, said: "This award is a global recognition of Professor O'Sullivan's very significant contribution to the advancement, awareness, education and research in Artificial Intelligence to make our world a better place and in securing our future."

**Director General of Science Foundation Ireland, Professor Philip Nolan**, said: "We are witnessing an extraordinary acceleration of Artificial Intelligence (AI) technology, as it disrupts and transforms the world of work, our economy and society. While we must harness the opportunity to improve, and make smarter and more responsive, systems such as health, transport and energy, it is vital that we do so in an ethical and responsible manner. I commend Professor O'Sullivan on this achievement, which recognises his leadership in placing Ireland at the forefront of using AI for good."

**Commenting on the announcement Professor John Cryan, Vice President for Research and Innovation at UCC** said: "I would like to congratulate Barry on this prestigious research recognition. It is particularly timely as Artificial Intelligence & Data Analytics is one of the ten strategic research areas that we have recently prioritised at an institutional level as part of our UCC Futures initiative."

Professor O'Sullivan has served as Vice Chair of the European Commission High-Level Expert Group on AI, which developed Europe's Ethics Guidelines for Trustworthy AI. He is a Fellow and a past President of the European AI Association (EurAI). He was the longest serving President of the Association for Constraint Programming and currently serves as an elected member of the Executive Council of the Association for the Advancement of Artificial Intelligence (AAAI). He chairs the Advisory Board of the GRACE project at Europol, and advises the Leuven.ai institute at KULeuven (Belgium) and the Computational Sustainability Network at Cornell University (USA).

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## SFI Supplemental Grant for Displaced Researchers - Ukraine

#### May 2022

Science and scholarly research relies upon the exchange of ideas through peaceful cooperation. In line with the Government of Ireland's response, SFI condemns in the strongest terms the invasion of Ukraine by the Russian Federation in violation of international law. In an effort to help tackle the humanitarian and economic loss, SFI is launching a new **supplemental grant scheme** to encourage and enable holders of existing SFI grants, and their associated Host Institutions, to provide opportunities for displaced researchers from Ukraine to join and collaborate on existing SFI-funded grants in order to integrate swiftly into the Irish research system, to enable them to maintain continuity in their research career and to bring added benefit to the SFI grant from their expertise.

Applications are open to principal investigators of existing SFI-funded grants to provide relevant research positions to displaced researchers from Ukraine at any stage of their research career.

Further information on this supplemental grant and how to apply is available here:

SFI Supplemental Grant for Displaced Researchers

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## SFI-IRC Pathway Programme 2022 Call

SFI and the Irish Research Council (IRC) are pleased to advise that the <u>SFI-IRC Pathway Programme</u> 2022 call is now open!

This programme is open to talented post-doctoral researchers across **all research disciplines** who are poised to transition to an independent research career.

There have been some changes to the eligibility criteria from the 2021 call, particularly with respect to employment history.

An information webinar will be held on **Thursday 2nd June 2022**. Details of the webinar and further information on the programme call is available here:

**SFI-IRC Pathway Programme** 

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## Irish research bodies to merge in new national innovation strategy

Ireland has a new national strategy to boost research and innovation, which includes the creation of a new funding body through a shake-up that will combine the Irish Research Council and Science Foundation Ireland. This new strategy was launched by the Government on may18th 2022 and is called **Impact 2030**.

See reports: <u>Main research funding bodies to be amalgamated (rte.ie)</u> <u>Science foundation and research council to merge in major shake-up – The Irish Times</u> <u>SFI and IRC to Merge in Research Funding Revamp – The University Times</u>

## **Impact 2030: Ireland's Research and Innovation Strategy**

From Department of Further and Higher Education, Research, Innovation and Science Published on 18 May 2022 Last updated on 18 May 2022

#### What Impact 2030 does

- 1. Five pillars of Impact 2030
- 2. <u>Key initiatives</u>
- 3. <u>Governance structures</u>

#### What Impact 2030 does

'Impact 2030: Ireland's Research and Innovation Strategy' puts research and innovation (R&I) at the heart of addressing Ireland's social, economic and environmental challenges.

Impact 2030 will maximise the impact of research and innovation on many national priorities. It will progress objectives shared across the Irish R&I system such as maximising its impact on public policymaking and implementation, and nurturing and attracting talent.

Minister for Further and Higher Education, Research, Innovation and Science, Simon Harris, <u>launched the</u> strategy on 18 May 2022.



#### Impact 2030: Ireland's Research and Innovation Strategy

Download

#### **Five pillars of Impact 2030**

Impact 2030 has five pillars, on the impact of:

- research and innovation on our economy, society and the environment
- research and innovation structures on excellence and outcomes
- innovation on enterprise success
- talent at the centre of the research and innovation ecosystem
- research and innovation on Ireland's all-island, EU and global connectivity

Three work programmes will guide implementation of the strategy. The strategy document contains the first work programme, which will last three years.

## **Key initiatives**

#### **European Research Area**

Ireland will continue to take active part in the <u>European Research Area</u>, based on national strengths and policy priorities.

#### **Horizon Europe**

Ireland will drive a strong performance in <u>Horizon Europe</u>. We will utilise our international success and collaboration for greatest impact in Ireland. Using mission-oriented approaches will aid in shared societal challenges.

#### **Smart Specialisation Strategy**

The Department of Enterprise, Trade and Employment will publish Ireland's new <u>Smart Specialisation</u> <u>Strategy</u>. It will improve the important connections between national research and innovation policy and regional enterprise policy.

#### **Creating Our Future**

The reports on the '<u>Creating Our Future</u>' campaign will be published shortly. Impact 2030 will build upon this work to foster public engagement in the research process.

#### **National Grand Challenges Programme**

The National Grand Challenges Programme will fund mission-oriented challenges and deliver impacts for society. The first calls to support the green transition and digital transformation will issue during summer 2022.

#### Policy and research links

The department's new Evidence for Policy unit will better link public policymakers and the public research system. New science advice structures will support this.

IRISH CHEMICAL NEWS ISSUE NO.2 MAY/ JUNE 2022

#### Creation of new competitive R&I funding agency

A new competitive R&I funding agency will be established by way of a landmark research bill. It will bring together the functions and activities of the Irish Research Council and Science Foundation Ireland. This new agency will continue to support excellent research within disciplines and build greater interdisciplinary research activity in Ireland.

#### **Review of R&I impact**

A comprehensive system-level review of research and innovation impact will be undertaken. The review will inform future policy direction and public investment.

#### **Knowledge transfer**

<u>Knowledge Transfer Ireland</u> will launch a new knowledge transfer programme for public research organisations. This time, it will include a particular focus on the new technological universities.

#### **Technological universities**

The <u>technological universities</u> will strengthen their research and innovation offices to drive regional impact.

#### **Talent programme**

The department will develop a talent programme to support early and mid-career researchers in Ireland to help them advance their careers.

#### International education and R&I strategy

We will identify how to strengthen Ireland's global R&I footprint through a new international education, research and innovation strategy.

### **Governance structures**

The department will establish new structures to support implementation of the strategy.

#### **Steering group**

The Impact 2030 steering group will bring together the Government departments most active in research investment. It will drive agile and cohesive delivery of the strategy.

#### **Implementation forum**

The Impact 2030 implementation forum will bring together research engaged government departments and agencies to discuss and progress issues of shared interest.

#### **Advisory forum**

A research and innovation advisory forum will be set up to engage with the research and innovation community and international experts. The Minister for Further and Higher Education, Research, Innovation and Science will chair the forum.

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# Minister Harris announces research grants for projects in health and climate

**10 May 2022, Dublin:** Minister for Further and Higher Education, Research, Innovation and Science, Simon Harris TD, has today announced 76 grants valued at €53.7 million to support frontiers research across ten Higher Education Institutions through Science Foundation Ireland (SFI).

The research supported will investigate areas such childhood ADHD, future coastal sea levels, new generation batteries, antiviral drugs to treat Covid-19 infections, safety critical software, the link between obesity and cancer and the futureproofing of crops to withstand flooding.

In line with SFI's gender strategy, the programme seeks to provide opportunities to address gender imbalance and to provide support for investigators returning to research after a period of leave. 42% of the research grants supported will be led by female researchers and 32% by emerging investigators early in their research careers.

The programme is run in collaboration with Geological Survey Ireland and the Sustainable Energy Authority of Ireland (SEAI) who are co-funding a number of the grants.

Commenting on the SFI Future Frontiers Programme, **Minister Harris TD**, said: "Congratulations to all the researchers who have received funding today as part of the SFI Frontiers for the Future Programme. I am delighted to support this programme which funds individual-led research, with an emphasis on fundamental research at the cutting edge of science and engineering which will help us build a better future for Ireland through discovery, innovation, and impact."

"Not only will these grants support research in important areas for Irish society, they will also fund the support 216 people in varying research positions across 10 Higher Education Institutes to further develop their research careers. We are investing in talent. I would like to offer my thanks to the Higher Education Institutions for their support in delivering this programme again this year."

**Professor Philip Nolan, Director General of SFI** said: "After the success of the first SFI Future Frontiers Programme in 2020, I am delighted to see 76 research grants awarded. The research programmes are wonderfully diverse, but they have one thing in common: they ask fundamental questions and will lead to important scientific breakthroughs, with important applications in areas such as climate action, biodiversity, human and animal health and digital transformation, with real and lasting benefits to our society and economy. The SFI Frontiers for the Future Programme is a key element of SFI's new strategy – Shaping Our Future providing support for excellent research." "It is really encouraging to see that 42% of the research grants are led by female researchers for the second year running. SFI is committed to addressing the gender imbalance evident in areas of Irish research and this is another example of that commitment in action."

Projects supported included:

- Dr Niamh Cahill at Maynooth University will develop state-of-the-art software to better understand and predict changes in Irish sea levels with a view to improve Ireland's costal defence strategies and reduce the impact of extreme sea-level changes. Co-funded by Geological Survey Ireland.
- Prof Valeria Nicolosi at Trinity College Dublin seeks to develop the next generation of batteries beyond lithium-ion technology. By using novel materials, this project may overcome the scarcity and distribution issues associated with the use of lithium and cobalt. Co-funded by SEAI.
- Prof James O'Donnell, RCSI University of Medicine and Health Sciences, will investigate how the body controls the levels of a critical component involved in blood clotting. This research will guide the identification of more effective ways to treat people with inherited blood-clotting disorders.
- Dr Robert Whelan and Prof Jane McGrath at Trinity College Dublin will research how to predict when standard treatments for attention deficit hyperactivity disorder (ADHD) might not be effective. It is hoped that this work will allow children with ADHD to access faster and better relief from symptoms.
- Dr Grace McCormack at NUI Galway will study a native honey-bee subspecies, which had previously been thought to be nearly extinct. This work seeks to understand how they have survived and adapted to the challenges caused by humans and will aid in their conservation.
- Prof Vivek Ranade, University of Limerick, will develop new insights, devices, and methods to enable on-demand, personalised manufacture in a compact 'factory in a box'.
- Dr Suzanne Martin, Technological University Dublin, will develop new transparent materials, suitable for use with light-emitting diode (LED) displays, capable of efficiently reducing both light pollution and energy costs, while maintaining visibility.
- Prof Isabel Rozas, Trinity College Dublin, seeks to build upon existing knowledge of anti-viral drugs to develop new and better drug treatments for COVID-19. If successful, this work could provide better ways to improve the health and wellbeing of patients with COVID-19.
- Dr Rosemary Monahan and Prof Barak Pearlmutter at Maynooth University will develop new approaches to address the need for a scalable solution to ensure safety in A.I.-based automated devices, such as driverless cars.
- Dr Tancredi Caruso and Dr Jonathan Yearsley at University College Dublin will carry out research to better understand how microbes in the soil support the ability of plants to resist extreme weather events, with a view to improving the resilience of agriculturally important plants.

- Dr Alexey Lastovetsky at University College Dublin will develop software that can reduce the significant energy needs associated with the ubiquitous use of computing in daily life, without compromising functionality and performance. Co-funded by SEAI.
- Dr Patrick Harrison at University College Cork will work to build on recent advances in the correction of errors in DNA, to expand its usefulness for treating a wider range of genetic disorders, including Cystic Fibrosis.

The full list of awards and projects supported can be found here.

The SFI Frontiers for the Future programme comprise two funding streams:

- Projects 58 high-risk, high-reward research projects will receive approx. €32.3m to facilitate highly innovative and novel approaches to research.
- Awards 18 larger scale innovative, collaborative excellent research programmes that have the potential to deliver economic and societal impact will receive approx. €21.4m in funding.

The SFI Frontiers for the Future Programme supports the development of world class research capability and human capital in areas of science, technology, engineering and mathematics (STEM) that demonstrably support and underpin enterprise competitiveness and societal development in Ireland.

Working across ten Higher Education Institutes, 216 research positions will be funded including 93 Postdoctoral scientists, 105 PhD students and 18 Research Assistants/others across a variety of different areas.

46 industrial collaborators are engaging in the research programmes.

The research will be undertaken in the following Higher Education Institutions: RCSI University of Medicine and Health Sciences, University College Dublin, Maynooth University, Trinity College Dublin, University of Limerick, National University of Ireland, Galway, University College Cork, Technological University Dublin, Tyndall National Institute and Dublin City University.

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## Minister Harris announces €16m invested in next generation energy system research and innovation partnership to decarbonise energy sector.

SFI, industry and philanthropic donor back strategic partnership between universities and industry across the island of Ireland



Photographed at the announcement: Prof Aoife Ahern, Minister Simon Harris, Prof Philip Nolan, David O'Reilly

**9th May 2022**: Minister for Further and Higher Education, Research, Innovation and Science, Simon Harris, TD, today announced a €16 million strategic research partnership to deliver energy system integration to decarbonise the energy sector.

NexSys (Next Generation Energy System) will help Ireland prepare to meet its carbon emission reduction target. Science Foundation Ireland (SFI) has awarded €8 million funding to NexSys, matched by philanthropic donation by David O'Reilly, Chair of UCD's Energy Advisory Board and NexSys industry partners.

Launching NexSys, **Minister Simon Harris** said: "I am delighted to announce details of NexSys, a partnership which aims to answer some of the fundamental research questions as part of the transition to net zero. The energy system encompasses technical, financial, and societal dimensions and this is core to the integrated and interdisciplinary research of NexSys. The transition to a net zero carbon energy system is one of the major challenges facing the world and is a crucial action to mitigate climate change. This project will help us address those challenges in a sustainable, fair manner."

Led by the UCD Energy Institute and supported by\* eight other research organisations and nine industry co-funding partners, the consortium has an ambitious plan for development of energy integration technology that will pave the way towards net zero transition in the Irish energy industry. NexSys will

also deliver a comprehensive programme of training for researchers in collaboration with industry over the next five years.

**Director of NexSys and UCD Energy Institute, Prof Andrew Keane** said: "NexSys is about the future, the future of our energy system and how we get to Net Zero Carbon and also about developing our island's talent to shape our future energy system. Solutions are front and centre of what we are developing. We are uniquely placed with our industry partnerships to develop cutting edge technologies alongside developing engagement and dialogue with society on the energy transition. The partnership will have potentially transformative socio-economic impacts, and will further enhance the global reputation of Irish research in the energy sector."

Commenting at the launch event, **Prof Philip Nolan, Director General, Science Foundation Ireland**, said: "Science Foundation Ireland is delighted to support this research partnership, which brings together a multidisciplinary research team with industry to focus on energy systems integration. Successful research and innovation in this important sector will deliver a more cost-effective energy system with less impact on the environment supporting our transition to zero emissions. NexSys also provides for important future skills in the sector by training early and mid-career researchers in energy systems integration."

NexSys builds on the success of its predecessor, the Energy Systems Integration Partnership Programme (ESIPP), delivering economic and social impacts through advances in energy generation in areas including energy demand of cities, water and transport sectors, and the wind energy sector.

**UCD College Principal of Engineering and Architecture and senior researcher on NexSys, Prof Aoife Ahern** said: "The NexSys project, with engineers of all disciplines, will play an important role in achieving a just energy transition for Ireland, in both public and private enterprises and I am delighted that UCD Engineering, which is a world leader in engineering research related to the environment and energy, will be so deeply involved in NexSys. Engineers influence every aspect of our lives, including infrastructure, transport, communications and energy provision, and the research and work done by engineering in this project is important in determining how we can maintain our current quality of life, while transitioning to renewable energies."

\*NexSys brings together nine academic institutions across the island of Ireland led by UCD, with partners Trinity College Dublin (TCD), Dublin City University (DCU), Economic Social Research Institute (ESRI), Maynooth University, University College Cork (UCC), NUI Galway, Ulster University and Queen's University Belfast.

NexSys is co-funded by industry partners EirGrid, ESB, Ervia/Gas Networks Ireland, CIE, RWE, SSE, Electric Power Research Institute (EPRI), Atlantic Hub and Davy.

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## **SARS CoV-2 Virus Updates and Developments**

How omicron's mutations make it the most infectious coronavirus variant yet 1 March Why omicron is more infectious than other coronavirus variants | Science News

## The SARS-CoV-2 spike reversibly samples an open-trimer conformation exposing novel epitopes

2 March <u>The SARS-CoV-2 spike reversibly samples an open-trimer conformation exposing novel epitopes | Nature</u> <u>Structural & Molecular Biology</u> https://doi.org/10.1038/s41594-022-00735-5

# Fast Emergence of New COVID Variants Due to Virus' Capacity for Rapid Burst Evolution

3 March Fast Emergence of New COVID Variants Due to Virus' Capacity for Rapid Burst Evolution (scitechdaily.com) DOI: 10.1093/molbev/msac013

## Infected People Could Have Multiple COVID Variants Hidden in Different Parts of the Body

3 March Infected People Could Have Multiple COVID Variants Hidden in Different Parts of the Body (scitechdaily.com)

## Genome-wide analysis provides genetic evidence that ACE2 influences COVID-19 risk and yields risk scores associated with severe disease

3 March Genome-wide analysis provides genetic evidence that ACE2 influences COVID-19 risk and yields risk scores associated with severe disease | Nature Genetics DOI https://doi.org/10.1038/s41588-021-01006-7

#### **Developing Plant-Based Vaccines and Therapeutics for COVID-19 and Beyond** 3 March

Developing Plant-Based Vaccines and Therapeutics for COVID-19 and Beyond | Technology Networks doi: 10.3390/vaccines9070761 doi: 10.1080/22221751.2019.1624482

## **Neem Tree Bark Extract May Protect Against COVID – Including Future Variants** 5 March

Neem Tree Bark Extract May Protect Against COVID – Including Future Variants (scitechdaily.com) DOI: 10.1016/j.virol.2022.01.002 and

## Azadirachta indica A. Juss bark extract and its Nimbin isomers restrict β-coronaviral infection and replication

? April

Azadirachta indica A. Juss bark extract and its Nimbin isomers restrict β-coronaviral infection and replication -ScienceDirect

#### **Even 'Mild' COVID Is Linked to Significant Brain Changes, Large Study Reveals** 7 March

Even 'Mild' COVID Is Linked to Significant Brain Changes, Large Study Reveals (sciencealert.com) and

## **SARS-CoV-2** is associated with changes in brain structure in UK Biobank 7 March

SARS-CoV-2 is associated with changes in brain structure in UK Biobank | Nature SARS-CoV-2 is associated with changes in brain structure in UK Biobank (nature.com) pdf DOI https://doi.org/10.1038/s41586-022-04569-5

## Current progress in SARS-CoV-2 vaccine candidates

7 March Current progress in SARS-CoV-2 vaccine candidates (news-medical.net)

### Variant that combines Delta and Omicron identified

9 March Variant that combines Delta and Omicron identified; dogs sniff out virus with high accuracy | Reuters

## Safety of mRNA vaccines administered during the initial 6 months of the US COVID-19 vaccination programme: an observational study of reports to the Vaccine Adverse Event Reporting System and v-safe - The Lancet Infectious Diseases

7 March <a href="https://www.thelancet.com/journals/laninf/article/PIIS1473-3099(22)00054-8/fulltext">https://www.thelancet.com/journals/laninf/article/PIIS1473-3099(22)00054-8/fulltext</a> DOI: <a href="https://doi.org/10.1016/S1473-3099(22)00054-8">https://doi.org/10.1016/S1473-3099(22)00054-8</a>

### The Irish Times view on Covid-19 in Ireland: preparing for worse

10 March The Irish Times view on Covid-19 in Ireland: preparing for worse

## Cambridge vaccine expert in \$42million partnership to develop 'future-proofed' coronavirus vaccines

8 March

Cambridge vaccine expert in \$42million partnership to develop 'future-proofed' coronavirus vaccines | University of Cambridge

### Are intrinsically disordered proteins the key to treating COVID-19?

8 March Are intrinsically disordered proteins the key to treating COVID-19? | CAS

### Delta-omicron hybrid variant identified for the first time | Live Science

11 March <u>https://www.livescience.com/deltacron-variant-</u> <u>confirmed?utm\_source=SmartBrief&utm\_medium=email&utm\_campaign=368B3745-DDE0-4A69-A2E8-</u> 62503D85375D&utm\_content=BAED34AD-FDD9-4B0D-8298-721A83DD42CD&utm\_term=79814908-be91-<u>4e09-9105-348debcdfc28</u>

#### **Can a chess grandmaster save the world?** (This is not about chess but Cobicistat but a directacting antiviral to treat SARS CoV 2)

14 March Can a chess grandmaster save the world? | ChessBase

### **Re-Engineering Red Blood Cells To Deliver Vaccines**

15 March Re-Engineering Red Blood Cells To Deliver Vaccines | Technology Networks 10.1371/journal.pone.0263671

## CAS: Are intrinsically disordered proteins the key to treating COVID-19? 8 March

Are intrinsically disordered proteins the key to treating COVID-19? | CAS

## Inexpensive New COVID-19 Vaccine Could Be Accessible for More of the World

19 March Inexpensive New COVID-19 Vaccine Could Be Accessible for More of the World (scitechdaily.com) DOI: 10.1126/sciadv.abl6015

## Scientists struggle to probe COVID's origins amid sparse data from China

17 March Scientists struggle to probe COVID's origins amid sparse data from China (nature.com) doi: https://doi.org/10.1038/d41586-022-00732-0

### Deltacron: what scientists know so far about this new hybrid coronavirus ( Prof Luke

O'Neill) 21 March Deltacron: what scientists know so far about this new hybrid coronavirus (theconversation.com)

## **New PCR Test Can Identify All COVID-19 Variants in a Positive Patient Sample** 22 March

New PCR Test Can Identify All COVID-19 Variants in a Positive Patient Sample (scitechdaily.com) DOI: 10.1016/j.jmoldx.2022.01.004

#### COVID's true death toll: much higher than official records

10 March <u>COVID's true death toll: much higher than official records (nature.com)</u> doi: https://doi.org/10.1038/d41586-022-00708-0

#### This is no time to stop tracking COVID-19

23 March <u>This is no time to stop tracking COVID-19 (nature.com)</u> doi: https://doi.org/10.1038/d41586-022-00788-y

## **Chemical Found in Broccoli Shown To Slow Growth of COVID-19 and Common Cold Viruses**

26 March

Chemical Found in Broccoli Shown To Slow Growth of COVID-19 and Common Cold Viruses (scitechdaily.com) DOI: 10.1038/s42003-022-03189-z

## 'High chance': Professor Whitty warns new variant 'worse' than Omicron could soon hit UK

25 March

Coronavirus UK news update: Variant worse than Omicron could hit UK | Express.co.uk

## Highly transmissible BA.2 variant accounts for 95% of Covid infections in Ireland 27 March

https://www.irishtimes.com/news/health/highly-transmissible-ba-2-variant-accounts-for-95-of-covid-infections-inireland-1.4837566

# **Omicron+Delta recombinant hints emergence of supervirus, expert warns; explains key features of next COVID variant**

28 March

https://www.livemint.com/science/news/omicron-delta-recombinant-hints-emergence-of-supervirus-expert-warns-explains-key-features-of-next-covid-variant-11648471676858.html

## After Omicron+Delta recombinant, 2 more hybrid Covid strains found; Expert explains how fatal they can be.

29 March

https://www.livemint.com/science/health/after-omicron-delta-recombinant-2-more-hybrid-covid-strains-found-expert-explains-how-fatal-they-can-be-11648550555021.html

## More transmissible than Omicron: All you must know about new Covid variant XE 2 April

More transmissible than Omicron: All you must know about new Covid variant XE (livemint.com)

## NIH Experts: The Concept of Classical Herd Immunity May Not Apply to COVID-19

3 April

NIH Experts: The Concept of Classical Herd Immunity May Not Apply to COVID-19 (scitechdaily.com) DOI: 10.1093/infdis/jiac109

## Large-Scale Study Confirms Which Type of Immunity Best Protects Against COVID

4 April Large-Scale Study Confirms Which Type of Immunity Best Protects Against COVID (sciencealert.com)

## First COVID-19 Human Challenge Trial Reveals Uneven Susceptibility

3 February <u>First COVID-19 Human Challenge Trial Reveals Uneven Susceptibility | The Scientist Magazine® (the</u>scientist.com)

#### Higher-profile COVID experts more likely to get online abuse

4 April

https://www.nature.com/articles/d41586-022-00936-4?utm\_source=Nature+Briefing&utm\_campaign=94700c0bdcbriefing-dy-20220405&utm\_medium=email&utm\_term=0\_c9dfd39373-94700c0bdc-45372434 doi: https://doi.org/10.1038/d41586-022-00936-4

#### Could computer models be the key to better COVID vaccines?

5 April <u>Could computer models be the key to better COVID vaccines? (nature.com)</u> doi: https://doi.org/10.1038/d41586-022-00924-8

## Newly Developed COVID Vaccine Could Protect Against Omicron and Other Variants

8 April

Newly Developed COVID Vaccine Could Protect Against Omicron and Other Variants (scitechdaily.com) DOI: 10.1111/all.15305

# Should we worry about the XE variant? Maybe not yet, but 'hybrids' will become more frequent as COVID evolves

10 April

### '3 Hybrid Variants In Circulation': Ntagi Chief On Xe, Other Omicron Mutant Strains | Mint

11 April

https://www.livemint.com/news/india/3-hybrid-variants-in-circulation-ntagi-chief-on-xe-other-omicron-mutantstrains-11649668830034.html

# SARS-CoV-2 Omicron breakthrough infections induce antibodies with cross-variant neutralization potential and recall memory B cells

5 April

https://www.news-medical.net/news/20220405/SARS-CoV-2-Omicron-breakthrough-infections-induce-antibodieswith-cross-variant-neutralization-potential-and-recall-memory-B-cells.aspx doi: https://doi.org/10.1101/2022.04.01.486695

# **COVID digest: WHO on alert over new omicron subvariants** | News | DW | and more 11 March

COVID digest: WHO on alert over new omicron subvariants | News | DW | 11.04.2022

## Omicron XE is spreading in the UK – a virologist explains what we know about this hybrid variant

12 April Omicron XE is spreading in the UK – a virologist explains what we know about this hybrid variant (theconversation.com)

## How Does the COVID-19 Prevention Drug Evusheld Work and Who Should Receive It?

12 April

How Does the COVID-19 Prevention Drug Evusheld Work and Who Should Receive It? (scitechdaily.com)

## Herd immunity now seems impossible. Welcome to the age of Covid reinfection | Devi Sridhar | The Guardian

12 April

https://www.theguardian.com/commentisfree/2022/apr/12/herd-immunity-covid-reinfection-virus-world

## Fourth Dose of BNT162b2 mRNA Covid-19 Vaccine in a Nationwide Setting | NEJM

13 April https://www.nejm.org/doi/full/10.1056/NEJMoa2201688 DOI: 10.1056/NEJMoa2201688

### COVID-19 vaccines carry a low risk of heart conditions, new research finds

13 April https://www.deseret.com/coronavirus/2022/4/12/23021840/covid-19-vaccines-risk-heart-conditions-study

## **Overcoming COVID Variants: Decoy Nanoparticles Trick Coronavirus As It Evolves**

16 April Overcoming COVID Variants: Decoy Nanoparticles Trick Coronavirus As It Evolves (scitechdaily.com) DOI: 10.1002/smll.202200125

## **ECDC and EMA issue advice on fourth doses of mRNA COVID-19 vaccines** 6 April

ECDC and EMA issue advice on fourth doses of mRNA COVID-19 vaccines | European Medicines Agency (europa.eu)

# New more infectious Covid-19 strain likely to be circulating in Ireland, says immunologist

18 April New more infectious Covid-19 strain likely to be circulating in Ireland, says immunologist (irishtimes.com)

#### Are new Omicron subvariants a threat? Here's how scientists are keeping watch 15 April

<u>Are new Omicron subvariants a threat? Here's how scientists are keeping watch (nature.com)</u> doi: https://doi.org/10.1038/d41586-022-01069-4

## The Valneva COVID vaccine has been approved for use in the UK – here's what the evidence says

20 April The Valneva COVID vaccine has been approved for use in the UK – here's what the evidence says (theconversation.com)

### Moderna: New Covid vaccine's omicron results improve on current shots

19 April https://www.cnbc.com/2022/04/19/moderna-redesigned-covid-vaccine-produced-stronger-immunity-againstomicron-than-current-shots.html

## Moderna's new COVID-19 booster protects better against Omicron, other variants

20 April COVID-19: Moderna's bivalent vaccine more effective against variants (medicalnewstoday.com)

#### Longer Interval Between COVID-19 Vaccines Generates Up to 9x As Many Protective Antibodies

22 April Longer Interval Between COVID-19 Vaccines Generates Up to 9x As Many Protective Antibodies (scitechdaily.com)

# Do You Need a Second COVID Booster Shot? An Epidemiologist Scoured the Latest Research for Answers

26 April

Do You Need a Second COVID Booster Shot? An Epidemiologist Scoured the Latest Research for Answers (scitechdaily.com)

### Clinical characteristics with inflammation profiling of long COVID and association with 1-year recovery following hospitalisation in the UK: a prospective observational study

23 April

Clinical characteristics with inflammation profiling of long COVID and association with 1-year recovery following hospitalisation in the UK: a prospective observational study - The Lancet Respiratory Medicine DOI: https://doi.org/10.1016/S2213-2600(22)00127-8

# **Researchers Assess the Power of T-Cell Immune Response to COVID-19 BA.1 and BA.2 Omicron Variants**

27 April Researchers Assess the Power of T-Cell Immune Response to COVID-19 BA.1 and BA.2 Omicron Variants (scitechdaily.com) DOI: 10.7717/peerj.13354

# Asthma Drug Montelukast (Singulair) Can Block Crucial COVID Protein, Reducing Viral Replication

27 April Asthma Drug Montelukast (Singulair) Can Block Crucial COVID Protein, Reducing Viral Replication (scitechdaily.com) DOI: 10.7554/eLife.74877

### Medical regulators: look beyond animal tests

27 April <u>Medical regulators: look beyond animal tests (nature.com)</u> doi: https://doi.org/10.1038/d41586-022-01110-6

# Daily longitudinal sampling of SARS-CoV-2 infection reveals substantial heterogeneity in infectiousness | Nature Microbiology

28 April https://www.nature.com/articles/s41564-022-01105-z DOI https://doi.org/10.1038/s41564-022-01105-z

### **Coronavirus Particles Likely Travel Farther Than Thought – Infectious Up to 200** Feet

2 May 2022 Coronavirus Particles Likely Travel Farther Than Thought – Infectious Up to 200 Feet (scitechdaily.com) DOI: 10.1016/j.icheatmasstransfer.2021.105746 DOI: 10.1111/ina.12940

# Remdesivir and three other drugs for hospitalised patients with COVID-19: final results of the WHO Solidarity randomised trial and updated meta-analyses - The Lancet

2 May https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(22)00519-0/fulltext DOI:https://doi.org/10.1016/S0140-6736(22)00519-0

## Identification of DAXX as a restriction factor of SARS-CoV-2 through a CRISPR/Cas9 screen | Nature Communications

4 May https://www.nature.com/articles/s41467-022-30134-9 DOI https://doi.org/10.1038/s41467-022-30134-9

# Study finds curcumin is a potential therapeutic agent against the Omicron variant of SARS-CoV-2

29 April Study finds curcumin is a potential therapeutic agent against the Omicron variant of SARS-CoV-2 (newsmedical.net) **doi**: https://doi.org/10.1016/j.compbiomed.2022.105552 <u>Curcumin inhibits spike protein of new SARS-CoV-2</u> variant of concern (VOC) Omicron, an in silico study - ScienceDirect

#### COVID's true death toll: much higher than official records

10 March <u>COVID's true death toll: much higher than official records (nature.com)</u> doi: https://doi.org/10.1038/d41586-022-00708-0

## Effectiveness of Ad26.COV2.S and BNT162b2 Vaccines against Omicron Variant in South Africa | NEJM

4 May https://www.nejm.org/doi/full/10.1056/NEJMc2202061 DOI: 10.1056/NEJMc2202061

# Increased emergency cardiovascular events among under-40 population in Israel during vaccine rollout and third COVID-19 wave | Scientific Reports

28 April https://www.nature.com/articles/s41598-022-10928-z DOI https://doi.org/10.1038/s41598-022-10928-z

### **Omicron as severe as other COVID variants -large U.S. study | Reuters**

5 May

 $\underline{https://www.reuters.com/business/healthcare-pharmaceuticals/omicron-severe-previous-covid-variants-large-study-finds-2022-05-05}$ 

## Infection with SARS-CoV-2 results in antibodies against common colds 8 May

Infection with SARS-CoV-2 results in antibodies against common colds (news-medical.net) doi:10.1126/sciadv.abn2911 https://www.science.org/doi/10.1126/sciadv.abn2911

#### **COVID-19: the next phase and beyond - The Lancet**

7 May https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(22)00817-0/fulltext DOI:https://doi.org/10.1016/S0140-6736(22)00817-0

### Fourth Covid jab can give higher immunity than initial booster, study finds | Vaccines and immunisation | The Guardian

9 May

https://www.theguardian.com/society/2022/may/09/fourth-covid-jab-can-give-higher-immunity-than-initial-boosterstudy-finds

## **Blocking Spike Captors To Counter the COVID Virus, Independently of Mutations** 10 May

Blocking Spike Captors To Counter the COVID Virus, Independently of Mutations (scitechdaily.com) DOI: 10.1038/s41467-022-30313-8

### New versions of Omicron are masters of immune evasion | Science | AAAS

10 May <u>New versions of Omicron are masters of immune evasion | Science | AAAS</u> doi: 10.1126/science.adc9473

### Here's the latest good and bad news about COVID-19 drugs

11 May Here's the latest good and bad news about COVID-19 drugs | Science News

### The Next Big COVID-Vaccine Gamble - The Atlantic

13 May https://www.theatlantic.com/health/archive/2022/05/covid-vaccine-recipe-omicron-protection/629846

## Immune recall improves antibody durability and breadth to SARS-CoV-2 variants

12 May https://www.science.org/doi/10.1126/sciimmunol.abp8328 DOI: 10.1126/sciimmunol.abp8328

## Public health considerations and evidence to support decisions on the implementation of a second mRNA COVID-19 vaccine booster dose

28 April <u>https://www.ecdc.europa.eu/en/publications-data/public-health-considerations-and-evidence-support-decisions-implementation-second</u>

#### **Epidemiological update: SARS-CoV-2 Omicron sub-lineages BA.4 and BA.5** 13 May

https://www.ecdc.europa.eu/en/news-events/epidemiological-update-sars-cov-2-omicron-sub-lineages-ba4-and-ba5

### Pfizer's Covid Vaccine Protection Against Omicron Fades Just Weeks After Second And Third Doses, Study Finds

13 May

 $\frac{https://www.forbes.com/sites/roberthart/2022/05/13/pfizers-covid-vaccine-protection-against-omicron-fades-just-weeks-after-second-and-third-doses-study-finds}{\label{eq:second-and-third-doses-study-finds}}$ 

### Safety, immunogenicity, and reactogenicity of BNT162b2 and mRNA-1273 COVID-19 vaccines given as fourth-dose boosters following two doses of ChAdOx1 nCoV-19 or BNT162b2 and a third dose of BNT162b2 (COV-BOOST): a multicentre, blinded, phase 2, randomise...

9 May

Safety, immunogenicity, and reactogenicity of BNT162b2 and mRNA-1273 COVID-19 vaccines given as fourthdose boosters following two doses of ChAdOx1 nCoV-19 or BNT162b2 and a third dose of BNT162b2 (COV-BOOST): a multicentre, blinded, phase 2, randomised trial - The Lancet Infectious Diseases DOI:https://doi.org/10.1016/S1473-3099(22)00271-7

# Heterologous immunization with inactivated vaccine followed by mRNA-booster elicits strong immunity against SARS-CoV-2 Omicron variant | Nature Communications

13 May https://www.nature.com/articles/s41467-022-30340-5 DOI https://doi.org/10.1038/s41467-022-30340-5

## **Coronavirus 'ghosts' found lingering in the gut** 11 May

https://www.nature.com/articles/d41586-022-01280-3 doi: https://doi.org/10.1038/d41586-022-01280-3

### Messenger RNA COVID-19 vaccines induce high levels of short-lived antibodies compared to natural infection

12 May

Messenger RNA COVID-19 vaccines induce high levels of short-lived antibodies compared to natural infection (news-medical.net)

doi: https://doi.org/10.1101/2022.05.08.22274817 https://www.medrxiv.org/content/10.1101/2022.05.08.22274817v1

## Study finds recent influenza vaccination is associated with an appreciable reduction in the risk of SARS-CoV-2 infection and COVID-19 severity

12 May

https://www.news-medical.net/news/20220512/Study-finds-recent-influenza-vaccination-is-associated-with-anappreciable-reduction-in-the-risk-of-SARS-CoV-2-infection-and-COVID-19-severity.aspx doi: https://doi.org/10.1101/2022.05.09.22274802 https://www.medrxiv.org/content/10.1101/2022.05.09.22274802 <u>v1</u>

## **Omicron Infections, Without Vaccinations, Provide Little Immunity**

19 Mav

https://www.genengnews.com/news/omicron-infections-without-vaccinations-provide-little-immunity and

#### Limited cross-variant immunity from SARS-CoV-2 Omicron without vaccination 18 May

Limited cross-variant immunity from SARS-CoV-2 Omicron without vaccination | Nature DOI https://doi.org/10.1038/s41586-022-04865-0

#### Luke O'Neill explains 'huge breakthrough' discovery about long COVID 19 May

Luke O'Neill explains 'huge breakthrough' discovery about long COVID (msn.com)

#### 4th COVID-19 vaccine dose gives 'significant' immunity boost (plus additional articles) 18 May

https://www.medicalnewstoday.com/articles/covid-19-vaccines-4th-dose-well-tolerated-and-boosts-immuneresponse and

#### Fourth COVID-19 Vaccine Boosts Antibody Levels Higher Than Third Dose 24 May

Fourth COVID-19 Vaccine Boosts Antibody Levels Higher Than Third Dose | Technology Networks doi: 10.1016/S1473-3099(22)00271-7.

## WHO validates 11th vaccine for COVID-19

19 May https://www.who.int/news/item/19-05-2022-who-validates-11th-vaccine-for-covid-19

## **Covid-19: Two new variants of concern in UK**

20 May https://www.rte.ie/news/coronavirus/2022/0520/1300251-covid-variants

## How long does COVID-19 linger in your body? New report offers clues.

20 May

How long does COVID-19 linger in your body? New report offers clues. (nationalgeographic.com)

## Unique antibody responses after third COVID-19 mRNA vaccination

16 May

https://www.news-medical.net/news/20220516/Unique-antibody-responses-after-third-COVID-19-mRNAvaccination.aspx https://doi.org/10.1101/2022.05.09.491201 https://www.biorxiv.org/content/10.1101/2022.05.09.491201v1

# Triple vaccination found to confer immune protection against SARS-CoV-2 Omicron BA.2 sublineage

16 May

https://www.news-medical.net/news/20220516/Triple-vaccination-found-to-confer-immune-protection-against-SARS-CoV-2-Omicron-BA2-sublineage.aspx doi: https://doi.org/10.1101/2022.05.09.491254 https://www.biorxiv.org/content/10.1101/2022.05.09.491254v1

# **COVID-19** vaccine effectiveness against the omicron (BA.2) variant in England - The Lancet Infectious Diseases

24 May

#### **Transmission of SARS-CoV-2 from humans to animals and potential host adaptation** | Nature Communications

27 May

Transmission of SARS-CoV-2 from humans to animals and potential host adaptation | Nature Communications DOI https://doi.org/10.1038/s41467-022-30698-6

## **An early warning system for emerging SARS-CoV-2 variants | Nature Medicine** 30 May

An early warning system for emerging SARS-CoV-2 variants | Nature Medicine DOI https://doi.org/10.1038/s41591-022-01836-w

## Astrazeneca + Pfizer Vaccines = Better Omicron Immunity | Mint

31 May <u>https://www.livemint.com/opinion/online-views/astrazeneca-plus-pfizer-vaccines-is-equal-to-better-omicron-immunity-11653975654444.html</u>

### Why call it BA.2.12.1? A guide to the tangled Omicron family

27 May <u>Why call it BA.2.12.1? A guide to the tangled Omicron family (nature.com)</u> doi: https://doi.org/10.1038/d41586-022-01466-9

## COVID death tolls: scientists acknowledge errors in WHO estimates

1 June <u>COVID death tolls: scientists acknowledge errors in WHO estimates (nature.com)</u> doi: https://doi.org/10.1038/d41586-022-01526-0

### "Battle Of Omicron" Being Won By New BA.4 And BA.5 Variants As Overlapping Covid Waves Hit U.S.

31 May "Battle Of Omicron" Being Won In U.S. By New BA.4 And BA.5 Variants – Deadline

# Inhaled vaccine for COVID-19: The pandemic accelerated decades of research leading to jab-free vaccine now in human testing

1 June

Inhaled vaccine for COVID-19: The pandemic accelerated decades of research leading to jab-free vaccine now in human testing (theconversation.com)

### COVID digest: Portugal sees major spike in cases

2 June COVID digest: Portugal sees case spike driven by omicron subvariant | News | DW | 02.06.2022

### Welcome to the Great Reinfection | WIRED

2 June Welcome to the Great Reinfection | WIRED

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## **IDA Updates & Reports**

## **DuPont Announces Multimillion Euro Transformation of Athlone Production Facility**



ATHLONE, Ireland, March 8 2022, – DuPont Water Solutions, a DuPont de Nemours, Inc. (NYSE:DD) business and global leader in water and wastewater treatment technologies, today announced a major transformation of the OxyMem<sup>™</sup> Membrane Aerated Biofilm Reactor (MABR) at its manufacturing facility in Athlone, Ireland. The investment in the facilities and employees at the Athlone site will help meet the increasing global demand for MABR.

OxyMem<sup>TM</sup> was the first company to commercialize MABR technology, which provides unique and differentiated performance for secondary wastewater treatment. DuPont acquired OxyMem<sup>TM</sup> in 2019, expanding its extensive portfolio of industry-leading water solutions that help produce, purify, and extract some of the world's most commercially important products.

This multimillion-euro investment includes additional training for staff based in Athlone. This project is supported by the Irish Government through IDA Ireland.

"As we look to a post-pandemic recovery, ensuring balanced regional enterprise development is key and the announcement today of DuPont's multimillion-euro investment at their site in Athlone, Ireland is indicative of their continued success in Athlone, and indeed a testament to the Midlands region as a great place to do business," said **Robert Troy, Minister for Trade Promotion, Digital and Company Regulation.** "This investment will have a transformative impact for the site and the staff, who will all benefit from upskilling. I was delighted to have the opportunity to visit the facility and see first-hand the excellent work being undertaken there. I wish the team the very best in this new chapter." "This investment will allow  $OxyMem^{TM}$  to develop more efficient and more reliable production technology as well as improve our product design to meet the continuously increasing demand by the market" said Andreas Gorenflo, General Manager of  $OxyMem^{TM}$ . "It is fundamentally important, and it will help us grow the company to meet the increasing global demand for MABR."

**Barry Heffernan OxyMem<sup>TM</sup> Technology Manager** added: "OxyMem's origins and success can be traced back to over 20 years. We began our journey in 2013 as a spin-out from the UCD School of Chemical and Bioprocess Engineering. This investment will allow us to continue to scale our smart production capabilities, digitization and automation, which will ultimately increase our local footprint both in R&D facilities and headcount."

Denis Curran, Head of Regions, Property and Enterprise Development at IDA Ireland said, "This is a very welcome announcement by DuPont and underlines the company's commitment to Athlone and the Midlands region. Transformation of client operations is a key focus area for IDA. This multi-million-euro investment will enable OxyMem to position itself for future growth opportunities. It is also strongly aligned with IDA Ireland's strategy of winning investments in regional locations. I wish DuPont and the OxyMem team every success as it scales its operations in Athlone."

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**LIMERICK, IRELAND – March 9, 2022** – Johnson & Johnson Vision\*, a global leader in eye health and part of Johnson & Johnson MedTech, has today announced a  $\in$ 35 million investment in its facility in Limerick, with the potential to create up to 200 new jobs over the next three years, including roles specific to the construction phase of the project.

**Niall Collins TD, Minister of State at the Department of Further and Higher Education, Research, Innovation and Science** attended the announcement of the investment in Johnson & Johnson Vision in its Limerick facility. Welcoming the investment, he said: *"This investment by Johnson & Johnson Vision in its Limerick plant is significant, and clearly signals their desire to drive, and commit to expanding their advanced manufacturing footprint in Ireland. The creation of 200 new jobs for the region also proves we can deliver a talented and skilled workforce ready to tackle some of the greatest challenges facing society. There is no doubt that the Johnson & Johnson Vision operations in Limerick are world-leading, and we can be proud that the results of that work will help people right across the world."* 

Our goal at Johnson & Johnson Vision is to bring improved eyesight to people around the world through the research, development, and manufacturing of new medical technologies. The manufacturing site in Limerick is one of our organization's largest manufacturing operations for the contact lens business and plays a fundamental role in supporting the Johnson & Johnson mission to change the trajectory of health around the world.

John Fitzgibbon, Operations Director, Johnson & Johnson Vision in Ireland said: "Nearly 2.2 billion people around the world face impaired vision, and approximately 20% (200 million) people worldwide suffer vision impairment or blindness caused by cataract or uncorrected refractive error. With the growth of our manufacturing operations in Limerick we are committed to changing these statistics, helping to solve a lifetime of eye health needs with our IOLs (intraocular lenses)."

Headquartered in Irvine, California, and Jacksonville, Florida, Johnson & Johnson Vision designs, manufactures and markets ACUVUE®, the world's brand leader in contact lens and TECNIS® IOLs

(intraocular lenses) for cataract patients.2

Johnson & Johnson Vision started operating in Limerick in 1996 with 60 employees. It recently celebrated its 25th anniversary in Limerick. In that time, the company has gone from strength to strength and is now one of the largest contact lens manufacturing facilities in the world, with a workforce of 1,600 people. The company has a strong focus on career progression through continuous education. From certificate to doctorate level programs, Johnson & Johnson Vision has supported 300+ employees in developing skills in new technologies since 2016.

**Gaspar Zuniga, Vice President, Supply Chain for Johnson & Johnson Vision** commented "We look forward to supporting more patients and eye care professionals with the products they need where they need them. This investment allows for the continued growth of our facility in Ireland. Our 25 years' experience working in Ireland is remarkable and the expansion of our site is proof of our employees' commitment to help more patients around the globe."

Recruitment is currently underway across a range of roles including in Operations (Supervisors & Product Assemblers), Engineering (Automation & Process), Quality (Engineering, Validation; Chemistry and Micro Labs). To learn more about joining the Johnson & Johnson Vision team in Limerick visit www.careers.jnj.com.

Mary Buckley, Executive Director, IDA Ireland said: "Today's announcement by Johnson & Johnson Vison Ireland in Limerick, is very good news for the Mid-West region and follows another significant investment at the company's CERENOVUS campus in Galway last month. The availability of a highly talented and skilled workforce in Ireland has enabled Johnson & Johnson's ambitious expansion plans. This announcement demonstrates IDA Ireland's continued commitment to winning Foreign Direct Investment (FDI) for regional locations. I wish the team at Johnson & Johnson Vision Ireland every success."

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## **IDA Ireland welcomes announcement of further substantial investment by Intel in Ireland**

**DUBLIN - 15th March 2022 -** IDA Ireland welcomes today's announcement by Intel of its continued substantial further investment in Ireland as part of its overall European plans.

CEO of Intel, Pat Gelsinger spoke with An Taoiseach, Micheál Martin and CEO IDA Ireland, Martin Shanahan ahead of today's announcement in Brussels.

The CEO of Intel outlined the company's European plans, acknowledged the continuing strength of Ireland's value proposition in the semi-conductor space and shared Intel's future investment plans for Ireland.

**Speaking in Washington DC, An Taoiseach Micheál Martin T.D,** said: "I spoke with Pat Gelsinger, CEO of Intel, about its announcement today in Brussels of its pan-European plans, which include substantive continued investment in Ireland. This announcement firmly underlines the importance of Intel's operations here for their future plans and the company's deep and ongoing commitment to Ireland.

Investing a further  $\in 12$  billion, on top of the  $\in 5$  billion previously announced on its new facility brings the overall investment by Intel in its site here to  $\in 30$  billion. This very significant show of confidence, in Ireland and in our talented and skilled workforce, is a strong endorsement of our offering to investors."

**Eamonn Sinnott, Intel Ireland General Manager** said: "The level of investment announced today is the strongest possible evidence of Intel's deep commitment to Ireland and demonstrates that Ireland is a very competitive location for leading edge investments such as these and will be into the future."

Speaking in New York, CEO, IDA Ireland, Martin Shanahan said: "The scale of the future investment in Ireland announced today by Intel is remarkable. The further  $\in 12$  billion investment will have a profound impact on the Irish economy in the coming years. This investment comes on the back of the  $\in 18.7$  billion invested by Intel since 1989,  $\in 5$  billion of which has been invested since 2019. In all, Intel's investment in Ireland (existing and planned) now stands at  $\in 30$  billion. What is clear from the announcement today is that Ireland remains integral to Intel's European and global plans. Intel's campus in Leixlip is home to one of the largest industrial construction projects in Europe, and will house some of the most complex manufacturing facilities in the world. Once the facility is operational, employment in Intel Ireland will stand at 6,500.

The global environment for attracting investment is extraordinarily competitive. Ireland has to continue to drive competitiveness across all aspects of our value proposition."

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## Janssen Announces €150M Investment in Cork to Expand Biopharmaceutical Supply Chain Footprint



**Cork, Ireland** – **25<sup>th</sup> March 2022:** Janssen Sciences Ireland[i], part of the Johnson & Johnson family of companies, today announced an expansion of its biopharmaceutical supply chain facility in Ringaskiddy, Co. Cork. The €150m investment in the facility has the potential to create 180 new full-time jobs.

This expansion will add to the existing global manufacturing capacity, allowing the company to reach patients with crucial biomedicines faster. Construction on the expansion started in early 2022, and is expected to take approximately two years to complete. Up to 300 people will be employed during the construction period.

## Speaking at today's announcement, An Tánaiste and Minister for Enterprise, Trade and Employment, Leo Varadkar T.D. said:

"This is really fantastic news, for Cork and for patients across the world who use the medicines made here. Janssen Sciences, part of the Johnson & Johnson family of companies, is investing €150m in its Ringaskiddy facility, creating around 180 new permanent jobs, with a further 300 construction jobs to carry out the expansion. I'm really proud of Ireland's thriving life sciences sector. Investment like this demonstrates the strength of talent we have here. I wish the team the very best of luck and thank them for their continued commitment to Ireland."

Operating in Ringaskiddy since 2005, the Janssen site manufactures medicines for immunology and oncology patients, addressing critical needs in areas such as Rheumatoid Arthritis, Crohn's Disease, Psoriasis, Psoriatic Arthritis and Multiple Myeloma. Today, as we celebrate Daffodil Day, it is important to remember the estimated 2000 people living in Ireland with Myeloma[ii], a form of blood cancer which affects the white blood cells made in the bone marrow[iii]. At Janssen we are committed to improving the treatment landscape of diseases where there is still an unmet medical need as we pursue our goal to create

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a future where disease is a thing of the past.

"Since its establishment in 2005, the Janssen site in Ringaskiddy has been at the cutting-edge of delivering life-changing healthcare products. The additional manufacturing capacity created by this investment will enhance the work we do to deliver transformational medicines that can change the trajectory of health," said Leila Schwery-Bou-Diab, Vice President Manufacturing & Technical Operation, Johnson & Johnson. "Every day, over 40,000 of our Janssen colleagues are working tirelessly to create a better future for our patients by fighting sickness with science, improving access with ingenuity, and healing hopelessness with heart".

This investment project has the potential to create 180 new full-time roles in the areas of facilities, engineering, quality, manufacturing and regulatory affairs. The company currently has a workforce of more than 700 people at the Ringaskiddy site.

"This is a really exciting time for our team in Ringaskiddy", said **Gary Hartnett, General Manager, Janssen Sciences**. "Not only are we announcing new investment in the facility, but we are also about to commence commercial production in our new manufacturing suite which was developed as part of our expansion in 2017, which will increase our capacity to manufacture life-changing medicines for patients all around the world.

"We will be adding 180 potential new roles as part of this announcement. It is an incredible opportunity to join a diverse workforce made up of the best and brightest minds, delivering cutting edge medicines that transform lives. The continued investment in our Ringaskiddy site is a real vote of confidence in the talent and dedication of our people, who I am proud to work with every single day as we strive to create a future where disease is a thing of the past".

The expansion is supported by the Irish Government through IDA Ireland.

"The Janssen site in Ringaskiddy is part of the very successful life sciences cluster which has been thriving in the South-West region for many years," said **Martin Shanahan, Chief Executive, IDA Ireland.** "The further investment announced today, which will have a hugely positive economic impact on the area, both in the construction phase and upon completion of the project, is very welcome. It is testament to Janssen's continued commitment to their Irish operations and will further enhance the region's life sciences offering, as well as continuing to deliver the significant positive economic impact it has since first establishing in Ringaskiddy in 2005. We look forward to continuing to work in collaboration with Janssen and the Johnson & Johnson family of companies in the coming years."

This announcement follows a €300m investment in 2017, which saw the construction of a large scale manufacturing suite at the site. This suite will shortly commence commercial operations, after successfully attaining all necessary manufacturing approvals. Continuous investment in the facility is serving to increase operational capacity to meet the demands of a growing clinic portfolio.

In 2020, the Janssen site in Ringaskiddy was designated as a Global Lighthouse site by the World Economic Forum, recognising it as one of the world's most advanced manufacturers leading the way in the adoption of Fourth Industrial Revolution technologies. This designation recognises the site's commitment to embracing and implementing Fourth Industrial Revolution technology across its processes. The site operates as a Global Centre of Excellence for Clinical Drug Substance and Drug Product Release and Stability Management, in addition to extensive Research & Development programmes to support the introduction of innovative biologic solutions to the Johnson & Johnson supply chain.

For more information on the roles that are available at Janssen Sciences Ireland, visit <u>Careers | Johnson & Johnson (jnj.com)</u>

[i] Janssen Sciences Ireland represents the products and services of Janssen Sciences Ireland UC, part of the Janssen Pharmaceutical Companies of Johnson & Johnson.

[ii] https://www.cancer.ie/cancer-information-and-support/cancer-types/multiplemyeloma#:~:text=Multiple%20myeloma%20is%20a%20blood,active%20monitoring%20or%20drug%20t herapies

[iii] https://www.cancer.ie/cancer-information-and-support/cancer-types/multiplemyeloma#:~:text=Multiple%20myeloma%20is%20a%20blood,active%20monitoring%20or%20drug%20t herapies





## €12 million investment by EirGen Pharma

#### 4 April 2022

EirGen Pharma has acquired a new building in the IDA Industrial Estate in Waterford which will facilitate an expansion of its Oral Solid Dose manufacturing and packaging capabilities. The new facility will provide an additional 3,500m<sup>2</sup> of state-of-the-art manufacturing and packaging capabilities for its global customer base.

An Tanaiste and Minister for Enterprise, Trade and Innovation, Leo Varadkar welcomed the news, saying: "Congratulations to Eirgen on this significant expansion which will amount to a  $\in$ 12m investment in Waterford. This decision really reinforces the company's commitment to Waterford and is a testament to the local team and talent pool we have in the South East."

**CEO Damien Burke** stated "The acquisition of this building and adjoining 1.2-hectare site strategically positions the business for sustained growth over the next ten years. It also represents a significant vote of confidence by the OPKO board in the capability of our employees, our leadership team in EirGen and Waterford as a locality to expand our business. This expansion will see up to  $\in 12$  million invested locally throughout the construction phase in 2022/2023.

This expansion has been planned since summer 2021, when EirGen Pharma agreed to sell its Sterile Fill Finish capability to Horizon Therapeutics plc. Within the sale was the Sterile Fill Finish technology and the EirGen Pharma Building at Butlerstown, Waterford.

At the time EirGen Pharma's parent company OPKO Health committed to investing in the growth and development of its core EirGen business in Waterford, consisting of Oral Solid Dose technology for R&D and Commercial supply to global markets from Waterford City.

EirGen has and will continue to be supported by the Irish Government through IDA Ireland. **IDA Ireland CEO Martin Shanahan** said:

"This site and building acquisition by EirGen marks a significant milestone in the company's evolution and growth in Waterford. It has, with this development, strongly endorsed Waterford and the South East Region as an excellent location for its continued development and future growth."

EirGen Pharma develops and supplies high potency specialty care medicines to patients in more than fifty countries worldwide. It was established in 2005 and has been part of OPKO Health since 2015.

Construction and fit out will commence in Q3 2022 with commercial operations starting in Q1 2024.



**Gilead Sciences Opens New Global Paediatric Drug Development Centre of Excellence in Dublin's North Dock** 



From L-R: Merdad Parsey, Chief Medical Officer; David Cadogan, Cork Manufacturing Site Head, VP Operations; Reggie Kelly, Dublin Site Head, VP Development Michael Lohan, Global Head of Lifesciences, IDA Ireland

Dublin, Ireland, April 6, 2022 – Gilead Sciences, a global biotechnology company, today announced the formal opening of its Dublin city centre office focused on developing new paediatric formulations for its portfolio of medicines. Development, clinical operations, legal / IP, medical affairs and regulatory teams will work together to create the company's only Global Paediatric Centre of Excellence, based in the North Dock area of the city centre.

"Gilead's therapies address some of the world's most challenging viral diseases, including HIV, viral hepatitis and COVID-19. Our Dublin teams play a critical role in adapting these therapies to treat children. In addition, as Gilead expands its work in oncology, our Irish teams could help to address the urgent challenge of childhood cancers," said **Daniel O'Day, Chairman and Chief Executive Officer, Gilead Sciences**. "Ireland has long been a global hub for life sciences and Gilead is proud to have been part of that since 1999. The new Dublin facility is a further investment in our long-term presence."

An Taoiseach, Micheál Martin said: "I am delighted to join with Gilead Sciences to mark the opening of their new Centre of Excellence for Paediatric Drug Development in the Dublin Docklands and the creation of 33 new jobs – a very welcome and positive announcement for the city. Gilead Sciences is a great example of a business delivering on the global stage, supported by our accomplished and skilled workforce. After over 20 years here in Ireland, this will be Gilead's fourth facility here, further underlining the leading role this country plays in the company's operations in Europe. Gilead's drive and commitment to innovation, and to the highest standards of pharmaceutical technology, is clear to see, and

will, I'm sure, continue to bring the company considerable further success in the years ahead."

**Tánaiste and Minister for Enterprise, Trade and Innovation, Leo Varadkar**, said: "I'm really pleased Gilead Sciences has chosen Dublin as the location for its new Global Paediatric Drug Development Centre of Excellence, creating 33 new jobs. This announcement reinforces the importance of Ireland globally in the manufacturing of medicines and in particular, the development of paediatric medicines. Our highly skilled workforce continues to attract world renowned companies such as Gilead Sciences to grow their businesses here. After more than 20 years in our country, this new facility is another exciting expansion for Gilead, and I wish the team the very best with this new initiative."

The Dublin Development office is responsible for coordinating paediatric clinical trials for seven products across 18 countries, with current trials investigating paediatric treatments for HIV, hepatitis B and COVID-19. The company plans to expand the responsibilities of the Dublin operations further, including supporting work on adult studies across its portfolio of approved and investigational medicines. Additionally, a new team to be recruited in the Dublin office will form a core part of a new Artificial Intelligence Centre within the Gilead Development organization.

**Reggie Kelly, Vice President, Development, Gilead Sciences**, and Dublin site lead said: "Development is a critical stage in the life cycle of a medicine and Ireland is a global life science hub. With the clinical, academic and regulatory expertise available – in addition to industry talent – Dublin was the obvious location. We chose this office carefully, for its location and it's sustainability credentials, and I'm thrilled to be able to open it to our team and our external partners."

**IDA Ireland CEO Martin Shanahan** said: "IDA Ireland welcomes Gilead's expansion of its Irish operations, establishing in Dublin this global biotechnology company's first Global Centre of Excellence for Paediatric Clinical Trials outside of the US. It's a strong vote of confidence in Ireland for investment of this kind and will be a welcome addition to the growing biotech ecosystem here."

Gilead has been in Ireland for over two decades. Its Cork manufacturing facilities produce 22 different products and its Dublin distribution centre, separate from North Dock, is critical in its global supply chain. In total, Gilead has over 500 employees in the State, its largest operation in the European Union (EU).

The Dublin Development office currently employs over 70 people in specialist roles and will have 33 new positions available in 2022. Additionally, Gilead has a further 24 roles currently open in Cork.

Current positions available at Gilead in Ireland can be found here.



# BOSTON SCIENTIFIC ANNOUNCES €100M INVESTMENT IN GALWAY CAMPUS



14 April 2022. GALWAY, IRELAND Boston Scientific Corporation (NYSE: BSX) - a global leader in medical device technology – today will unveil a new  $\in 100$  million expansion of its operations at Ballybrit in Galway. The expansion is expected to enable 300+ jobs in the coming years and includes over 40,000 square feet of medical device manufacturing space that will be powered by renewable energy.

"This is a welcome investment in the medical technology industry in Galway and the entire region, and it reflects real confidence in the quality and talent of the Irish workforce," said Taoiseach Micheál Martin. "Ireland has established itself as a global leader in the sector, with exciting opportunities to produce innovations that improve patient health and quality of life."

Boston Scientific has had a strong presence in Galway for nearly 30 years and has expanded site capabilities to include advanced product design, R&D and manufacturing. More than four million medical devices are exported from the Galway facility every year, including heart stents and valves, vascular balloons and oesophageal stents. These products help treat patients with conditions including heart disease, vascular disease, oesophageal cancer, and those at risk of stroke. The expanded site will include a carbon neutral manufacturing space in alignment with the company's goal to achieve carbon neutrality in all manufacturing and key distribution sites by 2030.

"This expansion reflects the important contributions of our workforce here in Galway and the strength of the broader business and local community in the west region," said James Lyons, vice president of Operations at Boston Scientific. "In addition to the investment in our physical space, we remain IRISH CHEMICAL NEWS ISSUE NO.2 MAY/ JUNE 2022 committed to fostering an inclusive workplace where all employees can find opportunities to grow in their careers."

As the company continues to support new ways of working, many employees at the Galway campus have transitioned to hybrid work models, with schedules that allow for both working remotely and in the office each week. New amenities include a gym and meeting spaces that are designed to support employee well-being and on-site collaboration.

"Boston Scientific has a workforce of more than 6,500 people across its sites in Galway, Clonmel and Cork, making it the largest life sciences employer in Ireland," said Martin Shanahan, CEO, IDA Ireland. "Today, Ireland has the highest per capita number of people employed in the European medical device industry. Boston Scientific is one of the leading global MedTech companies choosing to grow in Ireland and contribute to a vibrant industry sector, which has a key role to play in tackling the world's biggest healthcare challenges."



# **BioMarin 10 years in Ireland: Announcing future plans and unveiling new sculpture**



25 April 2022. Ireland, 25th April, 2022. Global biopharmaceutical company, BioMarin sought a unique way to celebrate 10 years in Ireland by recognising the deep connection to the communities in which it operates, especially rare disease populations. Today, Minister for Public Expenditure and Reform, Michael McGrath, T.D. officially unveiled The Giving Tree – a specially-commissioned sculpture by Cork-based artist, Rachel Doolin, which celebrates BioMarin's roots in Ireland. The sculpture consists of 1,200 individual bronze disks that when connected together create a structure with great strength and impact. For each disk, a native tree is being planted across Ireland, symbolising the company's commitment to the environment and aspiration to create a better future for rare disease patients.

At an event that brought together members of BioMarin's Global Executive team including Executive VP, Greg Guyer, employees, members of the medical and life science communities, public representatives and patient representative groups **Minister for Public Expenditure and Reform Michael McGrath**, **TD** said *"Today we are celebrating the successful partnership between BioMarin and Ireland. Over the last 10 years BioMarin's presence has grown, making Ireland the company's most significant operation outside of the US. Companies like BioMarin are very important to our economic success, but it extends beyond that to its connection to rare disease communities, to its employees and to the wider communities in Cork and in Dublin. This story of connection is reflected in The Giving Tree sculpture.* 

When BioMarin's first site in Ireland opened in 2012, the company employed just 12 people. BioMarin now employs over 500 people across two sites: Shanbally, Cork - the company's only manufacturing siteoutside of the US, and Earlsfort Terrace in Dublin – BioMarin's EMEA headquarters . BioMarin isinvested in Ireland, growing its roots from small beginnings to a new headquarters in Dublin thedevelopment of a €38m state-of-the-art expansion to the facility in Cork."

#### Jim Lennertz, Senior Vice President and head of the company's EMEA Commercial

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**Operations** headquartered in Dublin commented: "Ireland is a major location for BioMarin and we are very proud of what we have achieved in this country over the last 10 years. Patients across the globe are supported with therapies manufactured here in Ireland - this is an important era in the development of therapies for rare disease patients around the world, and our Irish Commercial and Manufacturing operations will play a key role in that success. The sculpture is a daily reminder of our connection back to the patients, to our environment and to each other."

**IDA Ireland CEO Martin Shanahan** said: "Since opening its doors in 2012 in Cork, BioMarin has steadily grown its team and indeed the strategic functions of the Shanbally site, the company's only manufacturing facility outside of the US. I wish to congratulate Michael O'Donnell all his team in Shanbally on this ten year anniversary and wish BioMarin continued success."

**Conor Delaney, VP of Operations, BioMarin International Limited and recently appointed Site Leader at Shanbally, Cork** speaking about the development of the Irish facility said: "Over the last 10 years, under the leadership of Michael O'Donnell, the site in Cork has grown and expanded, broadening our team and the therapies we can deliver. This year will see the establishment of a drug product-filling facility following a significant investment in the site which will position Shanbally as an end to end *Commercial supply hub for BioMarin. The Giving Tree sculpture allows us to highlight the connection,* partnerships and collaborative relationships that exist between BioMarin and the rare disease community. We are committed to do everything we can to provide pioneering treatments that improve the lives of those living with debilitating and life-threatening conditions. We have exceptional life sciences expertise at BioMarin, and an incredibly dedicated workforce that we are currently expanding as we actively recruit."

BioMarin worked with the National Sculpture Factory to run a commission for a sculpture that would reflect the company's presence in Ireland, patient connection and focus on sustainability. The timing of the commission had the additional impact of allowing BioMarin to support the arts industry in a time of great uncertainty due to the pandemic. Submissions were received from a number of artists across Ireland, and were reviewed by a panel of judges including leading patient advocate, Avril Daly, Vice-President of EURORDIS, former Chairperson of Rare Diseases Ireland, and CEO of Retina International. Irish artist, Rachel Doolin was unanimously selected by the panel.

The awarded artist, Rachel Doolin, recognised and reflected BioMarin's commitment to the rare disease community in her installation. The dedication of the teams at Shanbally, and across all BioMarin sites became even more evident during the Covid-19 pandemic, adapting operations to ensure the needs of the patients who depend on BioMarin's therapies continued to be met.

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## Tánaiste Leo Varadkar to embark on IDA Ireland and Enterprise Ireland US West Coast Trade & Investment Mission

**Monday 25<sup>th</sup> April 2022** - An Tánaiste Leo Varadkar T.D., is embarking on an IDA Ireland/Enterprise Ireland trade & investment mission to the West Coast of the US today. The Tánaiste will be accompanied by IDA Ireland CEO Martin Shanahan and Enterprise Ireland CEO Leo Clancy.

The US continues to be the largest single investor in Ireland and IDA Ireland has had a presence on the West Coast for over 40 years. Irish origin companies employ 100,000 people in the US, with over 10,000 of those in California & Washington State, supported by Enterprise Ireland's West Coast presence in San Francisco and Seattle. Ireland is the 9th largest source of US FDI.

Over the course of the week, as part of the joint mission An Tánaiste will meet with some of IDA's largest existing clients in Seattle, Silicon Valley and San Francisco, where he will also be joined by a number of Enterprise Ireland clients, led by Enterprise Ireland's CEO, Leo Clancy. The delegation will also meet with potential clients where senior executives from IDA Ireland will detail the unique advantages of locating in Ireland to service a European marketplace of 450 million people.

As part of the mission, An Tánaiste will also present IDA Ireland's Special Recognition Award to Google CEO, Sundar Pichai on Wednesday (27<sup>th</sup>) at a special IDA Ireland event at Google's Sunnyvale Campus in California. This is the second Special Recognition Award given by IDA Ireland, which recognises investor commitment to Ireland. Google has expanded its EU Headquarters in Ireland rapidly over nearly 20 years. This event will also recognise the significant contribution that Google Ireland has made in supporting the SME eco system in Ireland. The company has over 8,000 employees in Ireland.

An Tánaiste will also attend Enterprise Ireland meetings over the course of the week, including;

- Cybersecurity roundtable sessions with Enterprise Ireland clients and leading US cyber security companies
- Meeting with key venture capital leaders in Silicon Valley.
- A meeting with Technology Industry executives, focusing on senior female leaders in the Bay Area, organised in conjunction with colleagues at the Irish Consulate in San Francisco led by Consul General Robert O'Driscoll.
- Meetings with Enterprise Ireland clients and US-based companies, including Intuition, Starcircle, Utmost, and Taoglas.

Key sectors of focus for Enterprise Ireland during the mission include Cyber Security, Life Sciences and ICT. These are sectors with significant Irish company capability depth, and sectors that have seen steep growth in the US over the past 2 years.

The Tánaiste will also officially open the new Enterprise Ireland office, which is now located in Ireland

House San Francisco.

An Tánaiste Leo Varadkar said "This trade mission is a really good opportunity to meet personally with some of the biggest technology leaders in the world. The companies we are meeting collectively employ over 30,000 people across Ireland. We do not and cannot take this commitment for granted. We are constantly looking at ways we can grow jobs and investment in every county in the country, as part of our commitment to have 2.5m people at work by 2024, which would be the highest level of employment in the history of the state.

"We've a full agenda, visiting Seattle, LA and San Francisco, focusing on technology companies investing in Ireland, as well as several meetings with indigenous Irish companies, hopefully opening up opportunities for them to grow and invest in America, creating jobs both in the U.S. and at home.

"This trade mission is about attracting jobs and investment to every part of Ireland and I'm looking forward to what I hope will be a very fruitful trip."

The IDA Ireland companies an Tánaiste will meet are mainly in the technology and business services sectors.

The companies -

- Employ over 30,000 people directly in Ireland with associated spin off benefits in the wider Irish economy
- Have total annual revenues of over \$1.4 trillion.

Commenting on the investment mission:

**Martin Shanahan, CEO, IDA Ireland** said "As part of this investment mission, we will be meeting with some of the largest and most dynamic companies in the world of technology and business services. These companies continue to seek stable, pro-business locations for their businesses. This week is about deepening our relationships at the highest levels, and convincing new targets that Ireland is the place for their investment.

As we emerge from Covid travel restrictions, the importance of connecting in-person has never been stronger. This programme will remind investors of Ireland's many advantages across talent, track record and access to the European market. As I have said many times before, competition for foreign investment has never been as intense and investment missions increase awareness of Ireland's attractiveness as a place to invest.

"IDA Ireland is particularly glad to be able to recognise Google's contribution to Ireland over the last 20 years through our Special Recognition Award. The purpose of this award is to highlight investor commitment and contribution to Ireland over many years. Google's rapid expansion in Ireland is testament to the quality of the workforce available here.

"Investment from this part of the world continues to perform extremely well. In 2021, a total of 58 investments were secured from West Coast companies, accounting for 23% of the total number of IRISH CHEMICAL NEWS ISSUE NO.2 MAY/ JUNE 2022

investments into Ireland last year," concluded Martin Shanahan.

Top tier global companies such as Intel, Google, Salesforce, Microsoft, Amazon and many others have invested in and continue to expand in Ireland. Today, there are close to 250 West Coast headquartered companies operating in Ireland, employing in excess of 69,000 people – one quarter of total employment by IDA clients.

#### Leo Clancy, CEO, Enterprise Ireland said:

"With San Francisco known as the digital capital of the world and Seattle as the cloud capital, naturally the focus of the trade mission is on Ireland's strength in key digital technology sectors. The US is Ireland's largest single export market for goods and Enterprise Ireland's six offices across the United States continue to support Irish companies as they expand their reach into these markets and accelerate an export-led recovery for Irish business.

Irish companies continue to expand and grow their US footprint and investments, adding an additional 65 new presences in the US in 2021.

This trade mission builds upon Enterprise Ireland's in-market support for Irish companies growing their businesses in the United States, particularly along the West Coast and will deliver new opportunities in important, growing sectors including digital tech, med tech and fin tech."



# Takeda celebrates opening of innovative cell therapy production facility in Ireland

5 May 2022. State-of-the-art facility located at Grange Castle the first of its kind in Ireland

# Over 100 people currently working at the cell therapy facility with approximately 100 new jobs to be filled over the next three years

**DUBLIN, Ireland May 5, 2022**: Takeda Ireland, a subsidiary of Takeda Pharmaceutical Company Ltd, today celebrates the opening of a cell therapy production facility at its Grange Castle site. The commercial scale cell therapy production facility is the first of its kind in Ireland and will play an important role in supplying European, US and Canadian markets with a cell therapy treatment option for patients. There are over 100 people currently working at the cell therapy facility with another 100 new jobs to be filled over the next three years.

Commenting on the announcement **An Tánaiste and Minister for Enterprise, Trade and Employment, Leo Varadkar T.D.**, said: "Congratulations to Takeda on the opening of this new, state of the art facility, which already employs 100 people and will create 100 more jobs over the next 3 years. Takeda is at the forefront of cutting-edge research and innovation and the company's continued investment here underlines Ireland's position as a global hub for the biopharma sector. The treatments developed at this centre will make a real difference to patients' lives and I would like to thank the team for their commitment and wish them well in this new chapter."

The opening today follows an announcement in 2021 that Takeda would invest a further  $\in$ 36.4 million to support the expansion of the cell therapy facility at Grange Castle and create approximately 100 new jobs over the next three years. The expansion, which is now complete, will allow the team to support the growing global demand.

**Thomas Wozniewski, Takeda global manufacturing & supply officer,** commented: "The opening of this state-of-the-art cell therapy facility at Grange Castle illustrates Takeda's innovation capabilities and also underlines the importance of Ireland to the global Takeda manufacturing network. Cell therapy facilities require a specialized set of skills and the talent base in Ireland is as important as other frame conditions like proximity to partners and an international airport."

The facility will host drug product, drug substance and master cell stock. It will also play an important role in supplying drug substance to other Takeda manufacturing facilities. Due to the short shelf life of the treatment the facility has automated its supply chain and manufacturing processes, to create efficiencies and get the treatment to patients in need. The facility uses a number of rapid microbial test methods to ensure the release of product to patients in a timely manner. It is the first facility in Ireland that is approved to release a cellular therapy product commercially using rapid test methods.

**Paul Keogh, Grange Castle site head**, commented: "The Grange Castle site is growing from strength to strength thanks to a great team and strong investment in our people and technology. The treatment produced here will be delivered to patients within 72 hours of being released from Grange Castle which IRISH CHEMICAL NEWS ISSUE NO.2 MAY/ JUNE 2022

means we are closer to the patient than we have ever been and this brings a great sense of pride to our team."

**CEO of IDA Ireland, Martin Shanahan** said: Takeda's continued investment at its Grange Castle facility and the opening of this cell therapy production facility at its Grange Castle site is a huge vote of confidence in Ireland and our strong value proposition. Cell therapy is a core pillar in the emerging field of Advanced Therapy Medicinal Products (ATMPs), widely considered as the next generation of pharmaceutical therapies. These products require highly innovative approaches to manufacturing and offer unparalleled opportunities in the treatment of disease. This facility adds to Ireland's reputation as a global location of excellence for next-generation biopharmaceutical products."

The Takeda Grange Castle site uses 100% renewable electricity. The site is also one of the first pharmaceutical companies in Ireland to achieve an international standard for energy management known as the ISO 50001:2018 standard. This is a voluntary standard for designing, implementing and maintaining an energy management system, it includes setting objectives for improving the efficient use of energy. These measures support Takeda's wider commitment to being carbon zero in its own operations by 2040.

#### About Takeda Pharmaceutical Company Limited

Takeda Pharmaceutical Company Limited (TSE: 4502/NYSE: TAK) is a global, values-based, R&Ddriven biopharmaceutical leader headquartered in Japan, committed to discover and deliver lifetransforming treatments, guided by our commitment to patients, our people and the planet. Takeda focuses its R&D efforts on four therapeutic areas: Oncology, Rare Genetics and Hematology, Neuroscience, and Gastroenterology (GI). We also make targeted R&D investments in Plasma-Derived Therapies and Vaccines. We are focusing on developing highly innovative medicines that contribute to making a difference in people's lives by advancing the frontier of new treatment options and leveraging our enhanced collaborative R&D engine and capabilities to create a robust, modality-diverse pipeline. Our employees are committed to improving quality of life for patients and to working with our partners in health care in approximately 80 countries and regions. For more information, visit https://www.takeda.com/en-ie



## Horizon Therapeutics plc Celebrates Official Opening of New Global Headquarters Building in Dublin



**DUBLIN – 9 May 2022** – Horizon Therapeutics plc (Nasdaq: HZNP) today formally opened its new global corporate headquarters in Dublin, Ireland. The offices are located in a landmark building at 70 St. Stephen's Green. The 62,000 square foot facility is LEED Gold certified. Horizon executives and employees were joined by the An Taoiseach, Mr. Micheál Martin and Mr. Martin Shanahan, Chief Executive Officer, IDA Ireland.

Horizon's global headquarters have been in Dublin since 2014 and now employs approximately 200 people in Ireland across a variety of key functions including finance, legal, technical operations and research and development. The company today announced that it expects to employ up to 100 additional employees between Waterford and Dublin in the coming 18 months.

In 2021, the company purchased a 44,000 square foot manufacturing facility in Waterford, Ireland to support the growth of its on-market rare disease medicines and pipeline biologics. The company plans to add more than 50 high-end specialist roles in science and engineering in that facility by year end.

An Taoiseach, Mr. Micheál Martin said, "I am delighted to join Horizon to mark the opening of their new global corporate headquarters in Dublin. I also welcome the company's commitment to creating an additional 100 new jobs in Dublin and Waterford. The company's decision to add a manufacturing facility

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in Waterford last year further underlines the leading role Ireland plays in the company's operations. Horizon's drive and commitment to innovation and its highly skilled and talented workforce here will continue to bring the company considerable further success in the years ahead."

Speaking at the opening, **Timothy P. Walbert, chairman, president and Chief Executive Officer said**, "Ireland has been a wonderful location for Horizon for nearly 10 years and we as a company benefit enormously from the rich pool of talented and enthusiastic employees here. Ireland is a key part of our global strategy and we will continue to invest significantly here to enhance our business and to demonstrate our support for the wider community."

*Martin Shanahan, CEO of IDA Ireland* said, "Horizon is one of the next generation of high growth biotech companies and its investment and job creation in both its Dublin Global HQ and its advanced manufacturing facility in Waterford is very welcome and adds to Ireland's growing biopharma industry. I wish the Horizon team continued success and offer the ongoing support of IDA Ireland."

During the last two years, Horizon has provided approximately €1,000,000 in community support including over €120,000 in scholarships to help economically disadvantaged students attending Trinity College Dublin and South East Technological University, formerly Waterford Institute of Technology. In addition, Horizon was recently named the Title Partner of the Irish Open in a six-year deal, which will begin with the 2022 Horizon Irish Open at Mount Juliet Estate in County Kilkenny, Ireland, from June 30 to July 3.

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### Merck Invests more than €440 Million in Ireland

**Cork, Ireland May 23, 2022**: Merck, a leading science and technology company, is expanding its membrane and filtration manufacturing capabilities in Ireland. The company will invest approximately €440 million to increase membrane manufacturing capacity in Carrigtwohill and to build a new manufacturing facility at Blarney Business Park, both in Cork, Ireland. The investment, which is the largest in a single site ever for the Life Science business, will create more than 370 permanent jobs by the end of 2027.

Speaking at the site's official announcement, An Taoiseach Micheál Martin said: "I welcome today's very significant announcement from Merck, which underlines the company's commitment to doing business in Ireland. This investment, the largest in the history of Merck Life Science, speaks volumes about our capacity to provide the right conditions for multinational organisations to grow their operations. Ireland's development of a strong life sciences ecosystem has been one of our greatest economic successes. I am delighted that Merck has chosen Cork for its latest investment. I wish the team continued success, as they work towards improving lives around the world."

"Ireland is central to our strategy to drive long-term growth and expand our global leadership position in Life Science," said Matthias Heinzel, Member of the Executive Board of Merck, and CEO, Life Science. "The investment in Cork is the biggest site investment in the history of our Life Science business and will accelerate the delivery of the critical products, technologies and services our customers need to fight the world's toughest health challenges, including COVID-19."

Martin McAuliffe, Managing Director and Head of Cork Operations at Merck, said: "Today's announcement of the decision to construct a new membrane manufacturing facility in Carrigtwohill and the development of a new filtration manufacturing facility in Blarney is a testament to the capability, hard work and dedication of all our colleagues here in Cork. Beyond that, it is a statement of Merck's commitment to our Irish operations. These new investments secure a bright future for Merck in Cork and enable us to expand our capabilities here, generating new employment opportunities in future

technology."

Speaking from Davos today, IDA Ireland CEO Martin Shanahan said: "This significant investment announced today by Merck – the largest the global Life Sciences and Technology business has ever made in a single site, is very welcome. This announcement demonstrates the continued growth and success of Ireland's Life Sciences sector and indeed IDA Ireland's continued commitment to winning jobs and investment for regional locations. These developments in Carrigtwohill and Blarney will have a significant positive economic impact on the South West region, during the initial construction period and also with the number of full-time roles that will be created as a result of the expansion. Merck's decision to increase its footprint is tangible evidence of the company's confidence in Ireland's ability to provide access to world-class talent. I want to assure the team at Merck of IDA Ireland's continued support and wish them every success with this major investment."

At Blarney Business Park, Merck is going to build a new filtration manufacturing facility for almost €150 million. Once fully operational, it will increase Merck's global manufacturing capacity and supply customers producing both traditional and novel treatments and therapeutics.

With the more than  $\notin$ 290 million expansion in Carrigtwohill, Merck is adding a manufacturing facility for the immersion casting of membranes. These membranes support novel and gene therapies, as well as applications like virus sterilisation. The membranes also serve the Process Solutions business, which is one of the 'Big 3' growth drivers for Merck. Process Solutions markets products and services for the entire pharmaceutical manufacturing value chain. Merck aims to increase its Group sales to approximately  $\notin$ 25 billion by 2025. To achieve this growth target, the company increased its total investments between 2021 and 2025 significantly compared with the period from 2016 to 2020.

The announcement follows a  $\in$ 36 million investment at the same site in 2021 for a second lateral flow membrane manufacturing product line. Now formally open, this facility produces lateral flow membranes, most commonly used in rapid diagnostic testing for rare diseases such as dengue fever, malaria and Ebola. They are also a key component in rapid antigen tests, which are used for the detection of COVID-19.

Merck's Life Science business sector is continuing to invest in products and technologies across its portfolio that are key to manufacturing novel therapies and vaccines, including single-use solutions, high-potency active pharmaceutical ingredients (HP-APIs) and novel modalities, such as antibody-drug conjugates (ADCs) and viral and gene therapies (VGTs).

Over the next five years, Merck will implement investment programmes worldwide. Target countries include Germany, China, France, Switzerland, Ireland and the USA. All expansion projects include clear targets for energy efficiency, water consumption and waste treatment to support Merck in meeting its goal to be carbon-neutral by 2040, in line with its <u>sustainability strategy</u>.

Recently, Merck announced expansion projects in its Life Science business sector in Wuxi, China; Darmstadt, Germany; Buchs, Switzerland; Molsheim, France, Carlsbad, California, USA; Madison, Wisconsin, USA; Jaffrey, New Hampshire, USA; and Danvers, Massachusetts, USA. These expansions are part of an ambitious, multi-year programme to increase the industrial capacity and capabilities of Merck's Life Science business sector to support the growing global demand for lifesaving medications and to make significant contributions to public health.

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## Minister Robert Troy leads Enterprise Ireland and IDA Ireland Trade and Investment Mission to the US and Mexico

<u>Monday 16<sup>th</sup> May 2022</u>: Robert Troy TD, Minister for Trade Promotion, Digital and Company Regulation, will today commence a five-day trade and investment mission to the United States and Mexico covering South Carolina, Georgia, Monterrey and Mexico City. The trade mission, organised by Enterprise Ireland and IDA Ireland, aims to boost trade collaboration and support an accelerated exportled recovery of Irish businesses in international markets.

26 Irish companies will be taking part in the mission, representing a wide regional spread with participants based in Clare, Cork, Donegal, Dublin, Galway, Limerick, Monaghan, Tipperary and Westmeath.

During 2021, over 90 Enterprise Ireland client companies set up a new presence on the ground in the Americas, representing a broad range of sectors including digital technology, healthcare, agritech, cleantech and fintech. In 2020, Enterprise Ireland client exports to the US and Mexican markets combined reached almost €4.2bn. Over 165 Irish companies are active in the Mexican market, with exports of Irish goods and services to Mexico growing by 4% in 2020 to over €1.7 billion.

Over the five-day trade mission, Minister Troy will meet with senior executives from across the talent technology, fintech, advanced manufacturing and digital technology sectors, supporting the growth of 26 Enterprise Ireland client companies and reaffirming Ireland as an ideal location for American and Mexican companies to establish and grow.

Coinciding with the trade mission, a number of Irish business announcements will be made, including;

- Software company **Sitenna**, who recently launched their platform in the US, this week announce a new office presence in Atlanta, Georgia to support their growth in the market. Sitenna, headquartered in Limerick, provide software that helps telecom companies find and acquire new locations to install towers and antennae, particularly as telecom companies roll out 5G and IoT infrastructure.
- Fintech company **Trustap**, based in Cork, will announce a new sales and distribution partnership in the US with Claz. Trustap is a digital transaction platform that protects you from being scammed when you're transacting with someone you don't know by securing the buyer's money in a safe hold account until all the transaction milestones are met and the complaints period elapses.
- **Intouch.com**, the Dublin based retail technology company, is experiencing significant traction in the Mexican market. Their solution which enables retailers to offer personalised product recommendations to shoppers inside physical retail stores is now being used by a number of leading convenience store retailers throughout Mexico. Intouch.com expects Mexico to be its number 1 export market by the end of 2022 as it is currently closing a number of multi-million euro deals in the country and plans to open a Mexican office within the next 12 months.

#### Speaking ahead of the mission Minister Troy commented:

"I am delighted to lead the Enterprise Ireland and IDA Ireland trade mission to the USA and Mexico. This trade mission will focus on key growth opportunities and collaboration with both markets, supporting early entrants and established Irish companies to expand key business relationships. Ireland's continued contribution to FDI to the United States, at almost \$240 billion, highlights the depth of the economic ties we have with both countries. I look forward to meeting with a number of Irish companies bringing highly innovative products and solutions to their US and Mexican partners and stakeholders."

He continued, "While the US has always been a key market for Irish companies, we are keenly aware that Mexico and the United States share a long and robust economic and cultural relationship. Our ambition is that of the almost 900 Irish companies that export to the US, and the over 600 that have invested in the US, that this mission will help highlight Mexico as a logical next step for some to develop their footprint in North America."

While in Mexico, Minister Troy will connect with Mexican officials such as the Mayor of Monterrey, representatives from Mexico's Foreign Trade Council COMCE and the Mexico City government. He will also meet with Irish business leaders from Fenergo, Daon, Stripe, AWP Engineering, Prodieco, Swoop Funding, and Smarter Surfaces. Events will include a Business Networking event, Irish-Mexican Chamber of Commerce event, a Fintech roundtable, and a Business Leaders in Mexico event.

Jenny Melia, Enterprise Ireland Technology and Services Divisional Manager said: "The economic impact of Irish companies on both sides of the Atlantic is significant; with Irish companies generating exports reaching almost  $\notin$ 4.5 billion and employing over 110,000 people in North America. The focus of this mission is to further develop these partnerships, whilst promoting Irish innovation in key growth markets such as Mexico. Building upon Enterprise Ireland's in-market support for Irish companies growing their businesses in the Americas, this mission will deliver new opportunities in important, growing sectors including digital technology, talent technology and fintech."

**IDA Ireland's Paul Veale, Territory Director,** who will accompany the Minister to meetings with the companies of IDA Ireland's existing and target clients in the US and Mexico said: "*This trade & investment mission is a terrific opportunity to promote Ireland as a world class business location and very much open for business, despite the challenges experienced globally over the last two years. It's also an opportunity to share the strong message that Ireland is a gateway to Europe and an excellent location choice for those investors considering establishing operations in Europe."* 

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### **Biomerics announces expansion into Ireland**

30 May 2022. SALT LAKE CITY, UT – May 30, 2022 - Biomerics, the leading vertically integrated medical device contract manufacturer serving the interventional device market, has today announced the opening of a 2,000 sq. ft. Balloons & Balloon Catheters Centre of Excellence in Galway and the creation of approximately 40 jobs over the next five years. This is Biomerics' first facility in Europe and the second facility outside the United States after Costa Rica. It will become home to a growing team dedicated to the development and manufacturing of balloons and balloon catheters and act as an extension to the operations in Athens, TX.

This project is supported by the Irish Government through IDA Ireland.

**Galway-based Minister of State in the Department of Transport Hildegarde Naughton** welcomed the announcement stating, "I am delighted to welcome Biomerics to Ireland and indeed to Galway where it has chosen to establish its Balloons & Balloon Catheters Centre of Excellence. This move brings with it the creation of 40 jobs providing new opportunities for people to work and live in Galway, which has a proven track record when it comes to providing a rich pool of talent with a highly skilled and educated workforce. Today's announcement is a great achievement for the West of Ireland and signals a bright future for businesses across the country."

**Jhovanny Ortega, Commercial Director, Interventional Balloons,** will lead the new balloons & balloon catheters research and development facility. It will be a dedicated space for designing and developing complex balloon components used in future medical devices and applications, using various materials including polyurethanes, nylons, PET, and more. "I look forward to leading a group of individuals and creating cohesive teams that ultimately support the Biomerics vision," says Jhovanny.

The new office will be located at 2 Liosban Business Park in Galway. Biomerics chose to locate in Galway due to the region's significant cluster of medical device companies, a skilled labor pool, an international reputation, and access to suppliers and vendors. The office will be equipped with multiple balloon-forming machines, state-of-the-art test equipment, and a cleanroom that is ISO 13485:2016 certified.

"Having this new location is another step in our strategic growth plan. We continue to see a strong need around balloon component development," says Todd McFarland, President of Biomerics FMI. "Our focus will be on next-generation technologies, including micro- and sensing balloons. Additionally, the facility will provide more capacity to support our strategic customers in the interventional markets we serve."

"Biomerics strongly believes in fielding teams with excellent skillsets. We think it is essential to use an exploratory approach to designing and developing balloon components for a variety of critical medical device applications," says **CEO Travis Sessions**. "Jhovanny and his team will be the key to success for this facility, and we have every belief that he will thrive. We are always looking for new ways to innovate

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as it is the lifeblood of any company and adding a location here in Ireland helps us magnify our efforts and strengthen our vision."

**Global Head of Life Sciences at IDA Ireland Michael Lohan** said: "Biomerics' decision to locate its first European site in Galway is terrific news for Ireland and reflects the established Lifesciences cluster in the West Region. This announcement is an exemplar of IDA Ireland's continued commitment to winning innovative investments and job creation in regional locations. I wish Biomerics every success with this investment."

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## **Enterprise Ireland Updates & Reports**

## HealthBeacon launch Green Labs facility in Dublin

8 April 2022



- HealthBeacon has today launched its Green Labs facility in Dublin, with the event being officiated by Tánaiste and Minister for Enterprise, Trade and Employment Leo Varadkar T.D.
- HealthBeacon and their first Green Labs partner, Novartis Ireland have come together to utilise the Green Labs to create a platform to provide innovative sustainability solutions quickly and easily for patients on Novartis treatments.

HealthBeacon plc has today launched its Green Labs facility in Dublin, an innovative space that will enable a circular economy for pharmaceutical clients and an R&D centre for sustainable solutions for sharps waste in Ireland. The launch was officiated by Tánaiste and Minister for Enterprise, Trade and Employment Leo Varadkar TD. Leo Clancy, CEO Enterprise Ireland and Audrey Derveloy, General Manager and Country President, Novartis Ireland were also in attendance.

HealthBeacon is a leading Irish digital therapeutics company that develops products for managing injectable medications for patients in the home. The company's most recent peer-reviewed published evidence demonstrated up to a 26% improvement in injectable medication adherence by patients using its technology<sup>1</sup>.

HealthBeacon and Novartis Ireland have now formed a partnership to utilise the Green Labs to create a platform to provide innovative sustainability solutions quickly and easily for patients on Novartis

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treatments. The first chapter of this partnership is the provision of reusable sharps bins to rheumatology, dermatology and neurology patients. Smart technology reminds the patient to take their medication and notifies them when their sharps bin is nearing capacity. The full sharps bin is then collected from the patient's home, undergoes a validated washing regime and can then be returned to the patient for re-use, ensuring an environmentally friendly service for patients.

According to the World Health Organisation, each year an estimated 16 billion injections are administered worldwide<sup>2</sup>. HealthBeacon Green Labs is a positive step towards addressing the global challenge of sustainably managing patients' waste and supporting pharmaceutical companies to engage in more sustainable waste management practices. As an indigenous Irish company, HealthBeacon currently employs over 50 staff at their Dublin headquarters and operates across multiple markets with significant presence in the United States, the United Kingdom and the Netherlands.

In his remarks, Tánaiste and Minister for Enterprise, Trade and Employment Leo Varadkar T.D. commented, "We need to take better care of our planet. This generation should aim to pass it on to the next in a better condition than we inherited it. A big part of this involves using fewer of the earth's resources and recycling, repairing and reusing materials more often. It's called the circular economy. Medical waste I know can be a particular challenge given the need to make sure quality and safe standards are high and consistent and sterile to prevent infection. But there are solutions. I'm really happy to officially open this Green Labs facility from HealthBeacon. Congratulations to the team on their first partnership with Novartis Ireland too. I'm sure it will prove to be a beneficial collaboration for both partners."

**HealthBeacon CEO and Co-founder Jim Joyce said of the Green Labs launch** "Unfortunately, today billions of injectable waste devices and 100's of millions of sharps bins end up in household trash, landfills or incineration facilities. Today, in partnership with Novartis in Ireland we are taking a major step in reversing those unsustainable practices by launching our new EPA licensed Green Labs facility. This facility will allow us to sustainably process Sharps Bins and Injectable waste across Ireland. Together through innovative solutions and partnerships we can improve patient care in a more sustainable way."

Leo Clancy, Enterprise Ireland CEO, said: "Enterprise Ireland is proud to partner with HealthBeacon as they continue to play an important role in improving patient outcomes by harnessing smart technology. This latest step in their journey, as they partner with Novartis, also brings sustainable practices to the fore which is critically important, as the transition to a low carbon and circular economy is a whole of society challenge, and I congratulate both firms for their efforts in this space."

**Audrey Derveloy, Country President of Novartis in Ireland said of the HealthBeacon-Novartis partnership,** "Novartis are proud to partner with HealthBeacon on this project. We know from feedback from patients in Ireland, and with the increased provision of healthcare in patients' homes, that it is more important than ever for organisations to partner on developing sustainable solutions to medical waste management. Novartis' goal is to optimally treat disease, with the HealthBeacon "smart" sharps bin being just one example of a beyond the pill solution designed to ensure the best possible outcomes for patients. This new partnership gives us the opportunity to go a step further and work to provide a fully circular pharmaceutical supply chain for patients in Ireland, moving Novartis closer to its ambition to be carbon neutral across our supply chain by 2030.<sup>3</sup>"

#### About HealthBeacon

Headquartered in Dublin, HealthBeacon is an Irish digital therapeutics company that develops products for managing injectable medications for patients in the home. The HealthBeacon Injection Care IRISH CHEMICAL NEWS ISSUE NO.2 MAY/ JUNE 2022 Management System tracks adherence and persistence with medication schedules through the provision of medication management reminders, safe and sustainable sharps disposal devices, educational tools, and artificial intelligence (AI) driven data analytics. The Company operates in 17 countries primarily across Europe, North America and the United Kingdom employs more than 50 people and has obtained more than 30 design and utility patents. Peer reviewed evidence demonstrated up to a 26% improvement in injectable medication adherence by patients using its technology. The Company's mission is to become the world's leading digital therapeutics platform for injectable medications.

#### **About Novartis Ireland**

There are approximately 108,000 people working for Novartis around the world. Novartis Ireland currently employs about 1,500 people across three locations in Dublin and Cork. The Innovative Medicines Division (Pharmaceuticals), the Novartis Global Service Center (NGSC), and Novartis Gene Therapies are located in Dublin. Novartis manufacturing (NRL) is based in Ringaskiddy (Cork). Find out more at @NovartisIreland on Twitter or <u>www.novartis.ie</u>

#### References

- 1. ESPACOMP-20-044: Medication Adherence for Growth Hormone Treatment within The MAGIC Foundation. S. Glynn. Int J Clinical Pharm (2021) 43: 286-308
- 2. Health-care waste (who.int), Accessed Mar 2022
- 3. <u>Climate | Novartis</u>, Accessed Mar 2022

#### ENDS

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## **Roche Diagnostics and Enterprise Ireland launch Incubator Programme**

13 April 2022



# Enterprise Ireland in collaboration with Roche Diagnostics, is delighted to launch the Roche Diagnostics and Enterprise Ireland Incubator Programme 2022

Roche Diagnostics is a multinational company that develops and manufactures in vitro diagnostic solutions to help support clinical decision-making and transform the lives of patients in disease areas including cancer, cardiovascular disease and infectious diseases including COVID-19.

The Roche Diagnostics and Enterprise Ireland Incubator Programme aims to build on work already undertaken by the two organisations to support Irish start-ups and SMEs. Through the incubator, selected companies will be offered the opportunity to take part in a pitch event in Dublin, where one company will be chosen to receive bespoke mentorship from Roche through a 12-week programme. The programme will help them to accelerate their growth, building on Roche's long-standing expertise in the commercialisation of diagnostics and accelerator know-how.

Irish-owned and headquartered start-ups and Irish university spin-outs with a disruptive diagnostic technology are invited to apply. A webinar on 26 April will launch the programme, where interested parties are invited to attend to learn more regarding the process and how they can apply.

Commenting on the launch of the programme, **Finbarr Kenny, Director of Ireland at Roche Diagnostics said,** "Roche has a rich heritage in working with Irish-owned companies whom we partner with in providing diagnostic solutions to the Irish healthcare systems in Ireland. We recognise the important role that Enterprise Ireland plays in supporting start-up companies accelerate their innovations that address some of the current as well as future unmet needs, not just in Ireland but globally. We are excited to share our knowledge and experience with Irish start-up companies through this mentoring programme." **Garrett Murray, Head of the Lifesciences Sector at Enterprise Ireland said,** "Enterprise Ireland is very pleased to partner with Roche Diagnostics on this Incubator Programme. Collaboration and partnership are critical to the success of any innovative eco-system. Ireland has a long history of collaboration between companies, higher education institutions and our research and technology centres. This collaborative eco-system is one of the many unique conditions at play in Ireland which have led Irish life sciences companies to be among the most innovative in the world. Supporting the work of Roche Diagnostics on this initiative is very much in line with our strategy to accelerate the development of world-class Irish companies."

#### Who should apply

Irish-owned and headquartered start-ups and Irish university spin-outs with a disruptive diagnostic technology are invited to apply. Ideally you are a TRL level 4-6 start-up with innovations in areas such as oncology, cardiovascular, infectious diseases, women's health and neurodegenerative diseases, with diagnostic solutions that can be applied in a hospital laboratory, hospital point of care, primary care and/or home testing settings.

#### **Events**

The Q&A webinar launching the Incubator Programme will take place on Tuesday, 26 April, 2022.

Selected companies will then be invited to attend a pitch event taking place on **Monday**, **20 June**, **2022** at Enterprise Ireland's Head Office in Dublin. Interested companies are invited to register for the <u>webinar</u> <u>here</u>.

#### **About Roche Diagnostics**

Roche Diagnostics is a multinational company that develops and manufactures in vitro diagnostics solutions to help support clinical decision-making and transform the lives of patients. We are defined by the power of our scientific and technological capabilities around the world. Our global network of scientific excellence allows us to introduce and integrate breakthroughs in diagnostic science from across the world into healthcare systems with speed, accuracy and precision. Our portfolio of diagnostic solutions is vast and we are continually innovating. We have over 120 years of history and a track record of innovation and excellence around the world and within the UK and Ireland.

#### ENDS

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# Vitalograph announces €10 million investment and creation of 200 jobs



Minister of State Patrick O'Donovan with Frank Keane, CEO at Vitalograph

#### 25 April 2022.

- Company Opening Two New Sites in Ennis & Limerick
- Mid-West to Become Global Manufacturing Hub as it Reshores Production of Consumables from Asia to Ireland

Vitalograph, a global leader in the development and production of respiratory diagnostic devices, today announced an investment of  $\in 10M$  as it expands its operations in the Mid-West and creates 200 new roles over the next two years.

The company is opening new sites at Engine Innovate Building, Limerick and the Clare Technology Park, Ennis to accommodate the high value new jobs that will support the rapid growth of its global clinical trials and healthcare business. A significant investment is also being made in its existing manufacturing plant in Ennis as Vitalograph brings the production of its consumables from Asia to Ireland to achieve efficiencies of scale, increase the stability in their supply line and reduce the overall carbon footprint of these essential medical accessories.

Based in Ennis in County Clare since 1974, Vitalograph is a global leader in respiratory diagnostics, developing and manufacturing innovative medical diagnostical devices for all levels of the respiratory healthcare sector, and delivering full-service clinical trial solutions to pharmaceutical companies around the world. Vitalograph's clinical trial solutions, which have doubled in the last two years, are recognized among the best in the world for drug trials with a respiratory focus, and they hold a unique position as being the only company in the world to offer objective cough monitoring to leading commercial pharmaceutical companies, biotech, and research organizations.

Speaking at the announcement, **Minister of State Patrick O'Donovan**, said *"It's great to see Vitalograph, having established a base in Ennis in 1974, continuing to grow and develop its operations* 

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and expand its mandate, creating more than 200 new jobs in the next two years. This expansion underlines the company's commitment to Ireland and will allow it to continue to benefit from the rich pool of talent in Limerick and the mid-west region. I wish all the team the very best in this exciting new chapter."

**Frank Keane, CEO at Vitalograph**, said "Our latest investment and expansion plans reflects our pioneering spirit as we continue to embrace new opportunities for Vitalograph and play a significant role in improving patient lives. Effective respiratory diagnostics tools underline and enable a proactive approach to healthcare. Through our innovation and dedication, we have become an important catalyst behind the efficacy of the respiratory therapies being developed by the world's leading pharmaceutical companies and I would like to acknowledge the contribution our staff have made to our ongoing success."

"We're excited to open new offices in Limerick and Ennis. This gives us an opportunity to leverage the diverse talent pool in the mid-west region as we deliver on our purpose of making a real impact on the management of respiratory disease. We are grateful to Enterprise Ireland for their ongoing support, and we look forward to growing our workforce in Ennis and Limerick into the future," he continued.

"Vitalograph has an excellent track record, delivering innovative solutions for the global respiratory healthcare sector as well as clinical trial solutions to some of the largest pharmaceutical companies around the world," said **Tom Kelly, Manager - Industrial and Life Sciences Division at Enterprise Ireland.** "The opening of these two new sites in Ennis and Limerick, together with the company's plans to recruit an additional 200 people, is very welcome news for the Mid-West region. Enterprise Ireland is proud to support Vitalograph with its ambitious expansion plans and we look forward to continuing to work closely with the company as it embarks on its new phase of growth."

Recruitment for new candidates is already underway. Vitalograph is seeking candidates to fill a range of roles at all levels including data analysis, site support services, software engineering and QA, IT support and more. See <u>vitalograph.ie</u> for more.

#### ENDS

#### About Vitalograph - https://vitalograph.com/ie/

Headquartered in Buckingham, UK and with a R&D, engineering, and manufacturing facility in Ennis in County Clare since 1974, Vitalograph is a global leading provider of respiratory diagnostic products and clinical drug trial services. Through the delivery of respiratory diagnostic solutions that are accurate and reliable, healthcare professionals are empowered to give the best possible care to their patients, wherever it is needed. Vitalograph products are exported to 110 countries around the world.

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# siliconrepublic

### Siliconrepublic Briefings March – May 2022

#### 8 Trinity start-ups turning research into innovation

5 March

# Focusing on areas from agritech to mental health, these eight campus companies were celebrated for their work at the Trinity Innovation Awards.

On 22 February, academics, researchers and entrepreneurs gathered at Trinity College Dublin to recognise some of university's best minds in research and innovation.

The <u>Trinity Innovation Awards</u> sought to highlight the impressive work of many in the field, from Social Impact Awards to the headline Provost Innovation Award.

To continue go to: <u>8 Trinity start-ups turning research into innovation (siliconrepublic.com)</u>

Article by:

#### Jenny Darmody is the deputy editor of Silicon Republic

editorial@siliconrepublic.com

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#### UCC research suggests link between metabolism changes and 'long Covid' Irish study could explain why some people get long Covid

APC Microbiome researchers believe the findings could help in further investigations to explain why some people get long Covid and to develop potential treatments.

Researchers at University College Cork (UCC) investigating 'long Covid' have found a potential link between the immune system and impaired metabolism, which could help scientists understand the pathology of Covid-19 and its long-term consequences.

To continue go to:

UCC research suggests link between metabolism changes and 'long Covid' (siliconrepublic.com)

Article by:

Leigh Mc Gowran is a journalist with Silicon Republic editorial@siliconrepublic.com

#### Northern Ireland tech investment crossed a record £100m in 2021 8 March

New data from Catalyst suggests that tech firms saw unprecedented levels of funding in 2021, a meteoric rise from only £5m investment in 2014.

Tech investment in Northern Ireland has broken records, crossing the £100m mark for the first time in 2021 and marking a strong recovery from the pandemic.

To continue go to:

Northern Ireland tech investment crossed a record £100m in 2021 (siliconrepublic.com)

Article by:

Vish Gain is a journalist with Silicon Republic editorial@siliconrepublic.com

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#### €35m J&J investment in Limerick to create up to 200 jobs Limerick has seen a surge of STEM jobs announcements in the past week.

Johnson & Johnson Vision has announced a €35m investment in its facility in Limerick with the potential to create up to 200 new jobs over the next three years.

These jobs include roles required for the construction phase of the project. Jobs will also be created across operations, automation and process engineering, and quality control.

To continue go to: €35m J&J investment in Limerick to create up to 200 jobs (siliconrepublic.com)

Article by: By Elaine Burke

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# **Deloitte pledges almost €530,000 in funding to DCU's climate centre** 7 March

The DCU centre will look at how different areas such as politics, media and education can influence climate action.

Professional services firm Deloitte has become a founding partner of Dublin City University's (DCU) Centre for Climate and Society, pledging €176,000 in annual funding to the centre for the next three years.

To continue go to: Deloitte pledges almost €530,000 in funding to DCU's climate centre (siliconrepublic.com)

Article by:

Leigh Mc Gowran is a journalist with Silicon Republic editorial@siliconrepublic.com

## **Research into simpler graphene production could lead to new flexible tech**

# Researchers said the findings could pave the way for a 'new era' of flexible electronics, such as portable energy-harvesting devices, electronic skin and wearables.

Researchers in Sweden claim to have achieved high conductivity for a type of graphene that is manufactured in a simpler and cheaper method, which could lead to a "new era" of flexible electronics.

#### To continue go to:

Research into simpler graphene production could lead to new flexible tech (siliconrepublic.com)

Article by:

#### Leigh Mc Gowran is a journalist with Silicon Republic

editorial@siliconrepublic.com

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### 'Women researchers often need to work harder to be heard'

28 March

## Henkel's Dr Andrea Sättler discusses her own work in R&D and a new award that aims to recognise outstanding women in science.

While the science space has progressed for women over the years, there is still a long way to go - especially for women working in research.

One initiative from Henkel to help in this area is the Martha Schwarzkopf Award for Women in Science. With a prize of  $\notin 10,000$ , it is open to all women researchers in Europe who have completed a master's degree in natural sciences, medicine or computer sciences and whose field of work is hair research or other related research fields.

To continue go to: 'Women researchers often need to work harder to be heard' (siliconrepublic.com)

Article by: By Jenny Darmody, Deputy Editor of Silicon Republic in 2020

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#### **TU Dublin and Skillnet to run pharma manufacturing course through VR** 11 April

# The new course will enable learners to get the basics of powder handling for pharma manufacturing using a customised VR platform.

TU Dublin is to provide a new pharmaceutical training programme using virtual reality (VR), in collaboration with Skillnet Ireland.

The course will enable learners to get to grips with powder handling, a critical process in the pharmaceutical manufacturing industry. By using VR, it allows course participants to learn the essentials in a low-risk environment.

To continue go to: <u>TU Dublin and Skillnet to run pharma manufacturing course through VR (siliconrepublic.com)</u>

Article by: By Blathnaid O'Dea

## Can hydrogen fuel Ireland's green future?

22 April

#### Clean Hydrogen Partnership director Bart Biebuyck discusses the opportunity for Ireland to become a 'hydrogen valley' in the EU and the fuel's potential when it comes to energy storage to 'balance the grid'.

Using hydrogen as a form of clean fuel has been discussed for years, with supporters describing it as the future of energy. But has hydrogen technology reached the point where it's a feasible option as a green fuel source?

To continue go to: Can hydrogen fuel Ireland's green future? (siliconrepublic.com)

Article by:

Leigh Mc Gowran is a journalist with Silicon Republic editorial@siliconrepublic.com

#### Four researchers in Ireland secure grants from €624m ERC fund

26 April

The European Research Council awarded grants to more than 250 senior researchers across Europe as part of its 2021 Advanced Grants competition.

Four researchers in Ireland have been awarded grants from the latest European Research Council (ERC) competition.

To continue go to: Four researchers in Ireland secure grants from €624m ERC fund (siliconrepublic.com)

Article by:

Leigh Mc Gowran is a journalist with Silicon Republic editorial@siliconrepublic.com

#### Poolbeg Pharma eyes growth after £366,000 share sale

28 April Poolbeg, which is a spin-out of Irish pharma services company Open Orphan, hopes it can now attract additional new shareholders including specialist life science investors.

Infectious disease specialist Poolbeg Pharma confirmed the sale of  $\pounds 366,000$  of shares to new investors.

To continue go to: Poolbeg Pharma eyes growth after £366,000 share sale (siliconrepublic.com)

Article by: Leigh Mc Gowran is a journalist with Silicon Republic editorial@siliconrepublic.com
# How this Trinity scientist is unlocking nature's pharmacy

4 May

Trinity College Dublin's Dr Helen Sheridan discusses her work harnessing the medicinal power of Ireland's boglands and explains the importance of citizen science.

In February, leading researchers and innovators from Trinity College Dublin (TCD) were recognised for contributions to their fields at the <u>Trinity Innovation Awards 2021</u>.

One winner in the Societal Impact category was Dr Helen Sheridan, an associate professor at Trinity and founder of NatPro, the Trinity Centre for Natural Products Research, based at the School of Pharmacy and Pharmaceutical Sciences.

To continue go to: How this Trinity scientist is unlocking nature's pharmacy (siliconrepublic.com)

Article by:

Jenny Darmody is the deputy editor of Silicon Republic editorial@siliconrepublic.com

# Five Irish women leaders and founders win big at Dublin awards $_{16\,\mathrm{May}}$

### Rhonda Doyle of Schneider Electric Ireland received the overall WBM Businesswoman Award 2022 at the Women Mean Business conference.

Five Irish women have been awarded at the Women Mean Business conference for their success in leading businesses and start-ups in Ireland.

To continue go to: Five Irish women leaders and founders win big at Dublin awards (siliconrepublic.com)

Article by: Vish Gain is a journalist with Silicon Republic editorial@siliconrepublic.com

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## Irish teenager wins big at international science fair

19 May

Andrei Florian of St Aidan's CBS in Dublin won the top prize in the software category for his blockchain-based digital voting system.

Dublin teenager Andrei Florian has bagged two awards at an international science and engineering fair in the United States for his project on a novel internet voting system.

To continue go to: Irish teenager wins big at international science fair (siliconrepublic.com)

Article by: Vish Gain is a journalist with Silicon Republic editorial@siliconrepublic.com

# **Catherine Sheridan recognised as one of world's top women in hydrogen** 20 May

Based in Cork, Sheridan has held senior roles in engineering, project management and communications, with a passion for green energy and promoting STEM, diversity and inclusion.

Catherine Sheridan, COO of Irish green energy company EIH2, has been recognised as one of the top women globally in hydrogen, making it into the 'Women in Hydrogen 50' by Hydrogen Economist.

#### To continue go to: Catherine Sheridan recognised as one of world's top women in hydrogen (siliconrepublic.com)

Article by: Leigh Mc Gowran is a journalist with Silicon Republic editorial@siliconrepublic.com

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# Meet the woman tackling a sticky subject in science

25 May

Laurie Winkless is on a mission to explain the fascinating science lying just beneath the surfaces we interact with on a daily basis.

It's no secret that many areas of science have a comms problem. There has been much conversation and debate around the dangers of disinformation, how to fight against it and the unique struggle that scientists have in this department.

To continue go to: Meet the woman tackling a sticky subject in science (siliconrepublic.com)

Article by: Jenny Darmody is the deputy editor of Silicon Republic editorial@siliconrepublic.com

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# **Maynooth University to help Ireland tap into Earth observation data** 26 May

Ireland's Copernicus Academy and Relay is part of a Europe-wide network that aims to promote and develop the use of Earth observation data.

A new initiative at Maynooth University is part a European network designed to educate the public, industry and governments about the benefits of Earth observation data.

To continue go to:

Maynooth University to help Ireland tap into Earth observation data (siliconrepublic.com)

Article by:

Leigh Mc Gowran is a journalist with Silicon Republic <u>editorial@siliconrepublic.com</u>

# Irish researchers lead €2m EU project to boost bioeconomy education <sup>26 May</sup>

With funding from Horizon Europe, the BioBeo project aims to increase awareness of sustainability and the bioeconomy among young people in 10 countries.

The EU is funding a €2m international project to develop an education programme for young people focusing on sustainability and the bioeconomy.

To continue go to: Irish researchers lead €2m EU project to boost bioeconomy education (siliconrepublic.com)

Article by: Vish Gain is a journalist with Silicon Republic editorial@siliconrepublic.com

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# Maynooth University to help Ireland tap into Earth observation data

26 May

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Article by:

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#### **Kerry researcher wins MTU Commercial Invention of the Year** 31 May

Dr Joanna Tierney was recognised for her work on controlling coccidiosis in poultry, while photonics researchers bagged an award for the best technical invention.

Kerry-based researcher Dr Joanna Tierney was presented with the Munster Technological University (MTU) award for Commercial Invention of the Year 2021.

To continue go to: Kerry researcher wins MTU Commercial Invention of the Year (siliconrepublic.com)

Article by: Leigh Mc Gowran is a journalist with Silicon Republic editorial@siliconrepublic.com

#### Advion





The 2022 National Manufacturing & Supply Chain Conference & Exhibition will be held over two days – on 25th and 26th of May – at the RDS Simmonscourt in Dublin. Incorporating a comprehensive conference programme and an extensive exhibition area displaying the latest technological solutions and business services available, the National Manufacturing and Supply Chain Conference & Exhibition is the largest event of its kind in Ireland.

#### **Comprehensive Conference Programme**

The organiser of 2022 National Manufacturing & Supply Chain Conference & Exhibition, Dublin-based Premier Publishing & Events, is assembling an impressive line-up of manufacturing leaders, academics and government agencies who will engage in a stimulating blend of key note addresses and debates. The event will also feature an extensive exhibition showcasing the latest technological solutions and business services.

Visitors interested in improving the performance of their business can listen to case studies and technical presentations from leading global and local manufacturing experts, and meet with providers of cutting edge technology.

#### **Co-located Events**

A distinctive feature of the National Manufacturing & Supply Chain Conference & Exhibition is that it incorporates several complementary events – all under one roof. The co-located events in 2022 will cover sectors including: Automation & Robotics; IOT & Industry 4.0; 3D Printing; Medtech & Biotech; Pharmaceuticals & Life Sciences; Lean Productivity & Continuous Improvement; Electronics Manufacturing; Procurement; Supply Chain & Logistics; and Sustainability.

The event was initially planned for the larger space at City West Hotel but that venue was need for Ukrainian refugees but it still attracted great numbers of delegates. Many interesting lecturers were delivered where there was a Main Stage and five other stages where concurrent lectures occurred over the two days.

This link gives you access to the Agenda, Speakers, Associations, Exhibitors, Sponsors & Media with photos, video and the event brochure where you can review the full two day programme and lecture topics:

# National Manufacturing Event Conference & Exhibition

## **Simmons Court Lectures Photos**

## Sustainability



Mark Yeeles VP of Industrial Automation, Schneider Electric

What does sustainability really mean for industrial manufacturing?

Pharma, Med Tech, BioTech & Life Sciences



Barry Prost Co-Founder Yala

Strategies to successfully fill 'hard-to-fill' roles in the Pharmaceutical & Life Sciences Sector



Dr Adrienne Fleming Senior Lecturer Coordinator National Pharmaceutical Centre TU Dublin

Lifelong learning and Upskilling Opportunities - Training and Education Programmes - National Pharmaceutical Education Centre, TU Dublin



Dr John Beehan Head School of Sciences TU Dublin Laboratory Apprenticeships - 'earn as you learn' 331



Dr Ben Ryan Senior Lecturer in Pharmacology RCSI

BSc (Advanced Therapeutic Technologies) - Developing workplace ready science innovators



Lorcan O'Toole UCD Centre of Micro/Nano Manufacturing

3D structured hollow microneedles and dissolving microneedles





# Awards 2022



Premier Publishing and Events in association with Irish Manufacturing Research are proud to present Ireland's Manufacturing and Supply Chain Awards, May 25th 2022 Citywest Hotel. The awards build on the sell out success of the National Manufacturing & Supply Chain Exhibition & Conference which saw 6,000 delegates in attendance in 2020.

The awards will highlight the implementation of smart thinking to enable competitive manufacturing. Recognising Ireland's capacity to deliver world class manufacturing and attract inward investment.

# **REGISTER YOUR**

## **INTEREST**

#### Are you interested in

**Sponsoring, Entering or** 

### Attending the

## IMR Manufacturing & Supply Chain Awards

### **Register your interest Today!**

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