



Faraday Institution Conference 2025

Energising the UK Battery Ecosystem

Tuesday 9 September | Warwick Arts Centre, University of Warwick

08:30-	Registration and refreshments	
10:00	Lower Foyer, Ground Floor	

10:00-	Welcome Address The Theatre, First Floor
10:10	Professor Martin Freer, CEO, Faraday Institution
10:10-	Host's Welcome The Theatre, First Floor
10:20	The Rt Hon Greg Clark, Executive Chair of the University of Warwick's Innovation District
10:20-	Opening Remarks The Theatre, First Floor
10:30	TBC
10:30-	Academic Keynote Talk The Theatre, First Floor
11:20	Professor Sir Stanley Whittingham, Distinguished Professor of Chemistry and Materials Chemistry and
	Engineering, Binghamton University (USA)
	Li Batteries: 50 Years Old and the Future Challenges for an American Based Industry
	Chaired by: Professor Louis Piper, Professor of Battery Innovation, WMG – University of Warwick
11:20-	Industry Keynote Talk The Theatre, First Floor
12:00	Dave Rawlins, Head of Engineering – Heavy Industry and Decarbonisation, Fortescue Zero
	Enabling rapid decarbonisation: Achieving cost effective, scalable, and deployable real zero solutions for
	mine operations
	Chaired by: Professor Louis Piper, Professor of Battery Innovation, WMG – University of Warwick

12:00-	Lunch and Exhibition
14:00	Butterworth Hall, Ground Floor
12:50-	Henry Royce Institute and Faraday Institution Lunchtime Session The Studio, Ground Floor
13:40	Identifying Infrastructure Needs for The Electrochemical Sciences
	This lunchtime session will present emerging capabilities for research and development and promote a
	discussion of where there are gaps in capabilities available in the UK, and how these might be filled. This
	will be part of a series of workshops across the electrochemical sciences that will inform the
	development of a Statement of Need in Research Infrastructure for submission to EPSRC. There will be an
	opportunity to hear about the latest emerging capabilities, and to provide your input on areas that
	should be prioritised when identifying new infrastructure needs.

14:00-16:00 *Parallel Session* The Theatre, First Floor

Session | Active Materials & Supply Chain

Chaired by: Professor Paul Anderson, Professor of Strategic Elements and Materials Sustainability at University of Birmingham and Co-Director of the Birmingham Centre for Strategic Elements and Critical Materials

This theme covers all aspects of battery active materials supply chains for Li-ion and beyond Li-ion technologies from mining through to synthesis to performance in a battery cell. Hear about the development of global battery supply chains from virgin raw materials to recycled active materials, as well as discussions on Life Cycle Analysis studies of battery active material supply chains. Also included in the scope will be talks on new methods of sustainable material synthesis, processing parameters and surface engineering.

14:00-	Invited talk: Dr Evi Petavratzi, Principal Mineral Commodity Expert, British Geological Society (BGS)
14:40	From Mine to Megawatt: The critical raw materials behind battery technology
14:40-	Selected Talk: Dr Beth Murdock, Material Scientist, Redoxion
15:00	Building a resilient LiFe1-xMnxPO4 supply chain: scalable synthesis for a sustainable future
15:00-	Selected Talk: Malene Fumany, PhD Researcher, King's College London
15:20	Unravelling the interdependencies of policies, battery materials supply, and battery costs using a policy-economic framework
15:20-	Selected Talk: Dr Marcin Orzech, Senior Research Officer, Swansea University
15:40	Prussian White as extremely sustainable cathode for Na-ion batteries: scaling-up of zero waste synthesis
15:40-	Selected Talk: Dr Evangelos Kallitsis, Research Associate, Imperial College London
16:00	Power play: A multi-criteria analysis of present and future battery technologies





14:00-16:00 *Parallel Session* Woods Scawen, Upper Foyer, Ground Floor

Session | Battery Modelling

Chaired by: Professor James Marco, Professor of Battery Systems and Head of the Battery Systems Research Group, WMG – University of Warwick

The development and use of new modelling methods is fundamental to our ability to accelerate innovation from early cell development, through to the integration of cells into systems and their final deployment. The session will explore recent advances that demonstrate the value that modelling methods and tools bring across the entire battery ecosystem focusing on the interface between scientific discovery, engineering and manufacturing.

14:00-	Selected Talk: Roksana Jackowska, PhD Researcher, University of Birmingham
14:20	Kinetic limitations in Single-Crystal NCM cathode electrodes
14:20-	Selected Talk: Dr Edmund Dickinson, Head of Electrochemistry, About:Energy
14:40	What does it take to model lithium iron phosphate (LFP) cells? An electrochemical investigation
14:40-	Invited talk: Dr Sam Cooper, Reader in Artificial Intelligence for Materials Design in the Dyson School of
15:20	Design Engineering and Imperial College London
	Characterisation and design of electrodes using image-based AI
15:20-	Selected Talk: Dr Kit McColl, Postdoctoral Research Associate, Bath University
15:40	Mitigating voltage fade in Li-rich Mn-based layered oxide cathode materials
15:40-	Selected Talk: Dr Eric Woillez, Research Engineer, The French Alternative Energies and Atomic Energy
16:00	Commission (CEA)
	Classification of kinetic limitations in porous electrodes from the non-dimensional numbers of impedance
	spectroscopy

14:00-16:00 *Parallel Session* The Studio, Upper Foyer, Ground Floor

Session | Battery Safety & Abuse

Chaired by: Dr Mel Loveridge, Associate Professor of Electrochemical Materials, WMG – University of Warwick This themed session will span many aspects that are critical to Li and Na-ion battery safety. The core themes will encompass characterisation, testing and forensic approaches – this includes operando methods and includes early detection of failure modes. The session will also include discussion of materials and component improvements that are designed to improve safety and mitigate failure. Policy and regulation will be included as well as more technical considerations along with key aspects relevant to fire services.

14:00-	Selected Talk: Arthur Fordham, PhD Researcher, UCL
14:20	Listening to Batteries: Integrating Acoustic Techniques and High-Speed Synchrotron X-ray Radiography for
	Early Detection of Battery Failure
14:20-	Selected Talk: Begum Gulsoy, Lead Engineer, WMG – University of Warwick
14:40	Novel In-Situ Cell Instrumentation for Enhanced Battery Safety Evaluation
14:40-	Selected Talk: Dr Mark Wootton, Research Associate, University of Sheffield
15:00	Microkinetic Modelling for LIB Cathode Decomposition
15:00-	Selected Talk: Elliott Read, Lead Engineer (Cell Safety), WMG – University of Warwick
15:20	Sidewall rupture in cylindrical lithium-ion batteries - how does it affect thermal runaway propagation and
	what can we do about it?
15:20-	Invited talk: Dr Jonathan Buston, Principal Scientist, Health and Safety Executive (HSE)
16:00	What do we mean by safe?

16:00-	Exhibition Session Meet our exhibitors here.
18:00	Butterworth Hall, Ground Floor
16:00-	Poster Session
18:00	Mead Gallery, Ground Floor
18:15-	Welcome Networking Reception
20:30	National Automotive Innovation Centre, Lord Bhattacharyya Way, University of Warwick, CV4 7AL
	Catch up with existing colleagues and make new acquaintances at our welcome networking reception
	held on the first evening of the conference. Delegates will be treated to an evening of networking in the
	National Automotive Innovation Centre, the hub of automotive research and innovation in the West
	Midlands. This event is free to attend but must be pre-booked via the conference registration form.





Faraday Institution Conference 2025

Energising the UK Battery Ecosystem

Wednesday 10 September | Warwick Arts Centre, University of Warwick

09:00- Academic Keynote Talk | The Theatre, First Floor

09:50 Professor Shirley Meng, The Liew Family Professor at the Pritzker School of Molecular Engineering,

University of Chicago (USA)

Energy Storage Research Alliance - Innovation Beyond Lithium

Chaired by: Dr Valentina Gentili, Vice President of Global R&D, Agratas

09:50- Morning Refreshments10:30 Ground Floor Atrium

10:30-12:30 *Parallel Session* The Theatre, First Floor

Session | New Battery Chemistries & Interfaces (1)

Chaired by: Professor Venkataraman Thangadurai, Chair in Energy, University of St. Andrews

Boosting the energy density of existing Li-ion batteries requires the investigation of new battery chemistries and materials to increase the capacity of electrodes, and enhance the cell voltage, C-rate, and electrode lifetime. Some of these gains will be achieved by modifying the electrode/electrolyte interface. Insights are needed in both fundamental understanding and engineering advances. This theme intends to provide a forum for the dissemination of new advances and development in but not limited to next-generation Li-ion batteries, Na-ion/K-ion/multivalent ion batteries, solid-state batteries, and metal batteries. The theme focuses on the follow aspects:

- · Materials discovery of cathodes and anodes
- Mechanisms of charge storage in cathodes and anodes
- Mechanisms of metal plating and stripping
- Impact of the electrode/electrolyte interface
- Innovations in electrolytes including conventional liquid and solid-state electrolytes

10:30-	Invited talk: Professor John Irvine, Professor of Chemistry, University of St. Andrews
11:10	Talk title TBC
11:10-	Selected Talk: Professor Lee Johnson, Professor of Electrochemistry, University of Nottingham
11:30	Interfacial and electrolyte solution reactions at nickel-rich electrodes
11:30-	Selected Talk: Dr Gerard Bree, Associate Professor, WMG – University of Warwick
11:50	LMFP anodefree batteries: The ultimate in low cost, high energy density lithium cells?
11:50-	Selected Talk: Dr Juliane Fiates, Postdoctoral Research Associate, Newcastle University
12:10	Designing Stable Solid Electrolyte Interphases for Anode-Free Batteries: Insights from Atomistic Modelling
12:10-	Selected Talk: Dr Nagaraju Goli, Research Associate, Imperial College London
12:30	Additive manufacturing of microelectrodes for aqueous microbatteries

10:30-12:30 *Parallel Session* Woods Scawen, Upper Foyer, Ground Floor

Session | Electrode Manufacturing

Chaired by: Professor Patrick Grant, Vesuvius Chair of Materials and Pro-Vice-Chancellor (Research), University of Oxford

Manufacturing of battery electrodes is a cornerstone of energy storage innovation and battery cell development. This session will delve into the intricate processes and challenges involved in electrode manufacturing and development, through exploration of its scientific, engineering, and industrial dimensions. The theme will focus on how scientific and engineering understanding can be used to optimise electrode interfaces at all levels to ensure best performance in cell, from lab scale to full production. We will look to encompass critical aspects of slurry based and dry electrode manufacture, for both liquid and solid-state electrolyte systems. It will consider aspects such as (but not limited to) formulation and additives, understanding and development of mixing, coating, drying and calendaring technologies and their effects on electrode structure and performance. It will further consider electrode influence on critical parameters such as electrolyte wetting/ penetration and formation, along with influences of non-active components such as current collectors.

10:30-	Selected Talk: Dr Pengcheng Zhu, Senior Research Associate, University of Oxford
10:50	Advanced laser processing for electrode architecture design and manufacturing for high-energy and high-
	power lithium-ion batteries





10:50-	Selected Talk: Dr Erdogan Guk, Associate Professor, WMG – University of Warwick
11:10	Non-Destructive Ultrasonic Evaluation of Calendering Parameters on Lithium-Ion Battery Cathode
	Microstructure and Performance
11:10-	Invited talk: Dr Hieu Duong, Chief Manufacturing Officer, AM Batteries (USA)
11:50	Dry Battery Electrode Manufacturing Technologies
11:50-	Selected Talk: Tú Nguyen, PhD Researcher, Flemish Institute of Technological Research
12:10	Insights into High-loading 3D-printed LFP Electrodes in High Energy Density Li-ion Batteries
12:10-	Selected Talk: Dr Marveh Forghani, Postdoctoral Research Associate, University of Oxford
12:30	Optimizing Current Distribution in Large-Format Li-ion Batteries by Casting In-Plane Graded Electrode
	Materials

10:30-12:30 *Parallel Session* The Studio, Upper Foyer, Ground Floor

Session | Advances in Recycling & Reuse

Chaired by: Dr Lizzie Driscoll, Research Fellow, University of Birmingham

This session will provide an overview of the current global and national battery recycling industry. New and improved strategies for recycling battery components will be explored, focussing on non-active materials with greater challenges for recovery such as electrolytes, hard carbon and binders, seeking to identify solutions for adoption. The session will cover advances in physical separation, methods of making recycling processes safer, minimising waste and boosting efficiency. In addition, the session will consider to how overcome the challenges in the recycling of next-generation chemistries and larger cell formats.

10:30-	Selected Talk: Dr Kirstie McCombie, Research Fellow, WMG – University of Warwick
10:50	Direct Recycling of NMC Cathode Active Materials from Production Scraps
10:50-	Selected Talk: Lou Cooper, PhD Researcher, University of Birmingham
11:10	Green Solvents for the recovery of PVDF binder from lithium-ion battery electrodes
11:10-	Selected Talk: Stiven Lopez Guzman, PhD Researcher, CIC energiGUNE
11:30	Direct recycling of LNMO cathodes from different states of life
11:30-	Selected Talk: Dr Jake Yang, Lecturer of Physical Chemistry, University of Leicester
11:50	Short loop recycling of lithium-ion battery black mass using vegetable oil and ultrasound
11:50-	Invited talk: Professor Louise Horsfall, Chair of Sustainable Biotechnology, University of Edinburgh
12:30	A Bio-enabled Circular Economy for Batteries

12:30-	Lunch and Exhibition
14:00	Butterworth Hall, Ground Floor

14:00-	Industry Keynote Talk The Theatre, First Floor
14:40	Dr Reza Younesi, Founder of Altris AB and Associate Professor at Department of Chemistry - Ångström
	Laboratory, Uppsala University
	From fundamental understanding to upscaled production of sodium-ion batteries
	Chaired by: Ian Ellerington, Technology Transfer Director, Faraday Institution
14:40-	From Innovation to Market The Theatre, First Floor
16:00	Chaired by: Ian Ellerington, Technology Transfer Director, Faraday Institution
	For battery research to have a real-world impact it needs researchers, leaders, business people and
	entrepreneurs who can put breakthroughs on a path to commercialisation. In this session invited
	speakers will discuss their inspirational journeys from research lab to successful spin out companies in
	the battery space. They will highlight the challenges they faced along the way, how they were overcome,
	their motivations and rewards, and the importance of the help they received.
14:40-	Invited Talk: Dr Gyen Ming Angel, Director of Venture Building, Prosemino
14:55	How to Create a Clean Tech Company: Lessons from Building a Startup that Builds Startups
14:55-	Invited Talk: Dr Ola Hekselman, CEO and Co-founder, Solveteq
15:10	Talk Title TBC
15:10-	Invited Talk: Dr Alice Merryweather, Co-founder and Head of Applications, Illumion
15:25	illumion: Shining a light on batteries
15:25-	Invited Talk: Dr Gareth Hartley, Head of Lithium-Sulfur, Gelion
15:40	Reviving UK technology leadership: How Gelion has become a global leader in sulfur battery development
15:40-	Q&A with all speakers
16:00	





16:00-	Exhibition Session Meet our exhibitors here.
18:00	Butterworth Hall, Ground Floor
16:00-	Poster Session
18:00	Mead Gallery, Ground Floor
19:00-	Faraday Institution Conference Dinner & Community Awards
23:30	Coventry Cathedral, Priory St, Coventry CV1 5AB
	A must-attend for all registered delegates! Our popular Conference Dinner will take place inside the
	iconic Coventry Cathedral in Coventry city centre, nestled next to the breathtaking ruins of the original
	14th-century cathedral and widely regarded as a masterpiece of resilience and modernist design. As is
	now tradition, as well as a pre-dinner drinks reception and three course meal, dinner guests will
	celebrate the winners of our Faraday Institution Community Awards announced on the night.
	After-dinner guest speaker: Robert Llewellyn, Founder, Fully Charged Show
	Renowned EV advocate and Founder of the Fully Charged Show, Robert will indulge us with his outlook of
	the EV landscape, the future of transport and the vital role batteries play.

Faraday Institution Conference 2025 *Energising the UK Battery Ecosystem*

Thursday 11 September | Warwick Arts Centre, University of Warwick

10:00-12:00 *Parallel Session* The Theatre, First Floor

Session | New Battery Chemistries & Interfaces (2)

Chaired by: Dr Georgina Gregory, Royal Society Dorothy Hodgkin Fellow, University of Oxford

Boosting the energy density of existing Li-ion batteries requires the investigation of new battery chemistries and materials to increase the capacity of electrodes, and enhance the cell voltage, C-rate, and electrode lifetime. Some of these gains will be achieved by modifying the electrode/electrolyte interface. Insights are needed in both fundamental understanding and engineering advances. This theme intends to provide a forum for the dissemination of new advances and development in but not limited to next-generation Li-ion batteries, Na-ion/K-ion/multivalent ion batteries, solid-state batteries, and metal batteries. The theme focuses on the follow aspects:

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- Mechanisms of charge storage in cathodes and anodes
- · Mechanisms of metal plating and stripping
- Impact of the electrode/electrolyte interface
- Innovations in electrolytes including conventional liquid and solid-state electrolytes

10:00-	Invited talk: Dr Robert House, Associate Professor of Materials, University of Oxford
10:40	Advances in high energy density cathode materials for Li and beyond Li batteries
10:40-	Selected Talk: Kanyapat Yiamsawat, PhD Researcher, University of Oxford
11:00	Balancing Performance and Environmental Impact: Recyclable Fluorinated Polymers in Solid-State
	Batteries
11:00-	Selected Talk: Professor Darren Walsh, Professor of Chemistry, University of Nottingham
11:20	Cycling Magnesium Electrodes in Simple Salt Glyme Electrolytes and the Prospects for High Performance
	Magnesium Batteries
11:20-	Selected Talk: Dr Sundeep Vema, Postdoctoral Research Associate, University of Cambridge
11:40	Impurity deposition drives contact loss at Li metal-solid electrolyte interface in solid-state batteries
11:40-	Selected Talk: Dr Ashley Willow, Senior Lecturer, Swansea University
12:00	Design and Validation of "Anode-Free" Sodium-Ion Pouch Cells Employing Prussian White Cathodes

10:00-12:00 *Parallel Session* Woods Scawen, Upper Foyer, Ground Floor

Session | Advanced Characterisation & Degradation

Chaired by: Dr Gabriel Perez, Instrument Scientist, ISIS Neutron and Muon Source

A thorough understanding of degradation and failure mechanisms in battery systems is critical for developing effective countermeasures to mitigate these issues and extend battery life. These mechanisms result from a wide variety of structural and morphological changes occurring across multiple scales within the system, often intertwined in complex ways that make them challenging to investigate. Addressing this requires a comprehensive suite of advanced characterisation techniques, such as those available at central facilities. This session will explore a diverse range of characterisation approaches, and the strategies used to establish degradation mechanism in battery systems. Topics will include in situ/operando methods, software and simulation tools, and advanced





electrochemical techniques. Additionally, optimised methods for tracking battery health throughout its effective lifetime will be discussed.	
10:00-	Selected Talk: Dr Ashok Menon, Senior Research Fellow, WMG – University of Warwick
40.00	To and the LO country of the control

10:00-	Selected Talk: Dr Ashok Menon, Senior Research Fellow, WMG – University of Warwick
10:20	Towards Ideal Operando Experiments: Characterising Degradation Processes in Unmodified Pilot Line
	Single- and Multi-layered Pouch Cells through Operando X-ray and Neutron Techniques
10:20-	Selected Talk: Dr Haijun Ruan, Assistant Professor, Coventry University
10:40	Harnessing AI to enable fast diagnostics of degradation modes towards precise mitigation of battery
	degradation
10:40-	Invited talk: Professor Nuria Garcia-Araez, University of Southampton
11:20	Operando gas analysis to unpin the root reactions triggering degradation of high energy batteries
11:20-	Selected Talk: Dr Wei Yu, Assistant Professor, Tohoku University (Japan)
11:40	Isotopic 13C mesoporous carbons decouple degradation in lithium-oxygen batteries
11:40-	Selected Talk: Dr Chengge Jiao, Staff Scientist, Thermofisher Scientific
12:00	Automated FIB Cross-Sectioning for 3D SIMS: Local Volume and Global Volume 7Li+ Distribution in
	NMC811

10:00-11:30 *Parallel Session* The Studio, Upper Foyer, Ground Floor

Session | Maximising Academic-Industry Collaboration

Chaired by: Professor Emma Kendrick, Professor of Energy Materials, University of Birmingham

In this session, we'll explore how we can bridge the gap to leverage the strengths of both academia and industry to accelerate innovation. We'll hear from leading experts from universities and companies who will share their experiences, challenges, and success stories in collaborative R&D. Importantly, we will highlight the impact of Faraday Institution-funded initiatives such as Industry Sprints, which have played a key role in fostering collaboration, providing industrial experience and new skills to academic researchers, and delivering tangible benefits to both sectors.

10:00-	Invited Talk: Dr Dhammika Widanalage, Head of Battery Modelling, Breathe Battery Technologies
10:20	Shifting Gears: Do's and Don'ts on the Path from Academia to Industry
10:20-	Industry Sprint Flash Talk: Professor Serena Margadonna, Chair of Chemical Engineering, Swansea
10:35	University
	Co-Designing Scalable Battery Technologies: Insights from an Industry Sprint Project
10:35-	Industry Sprint Flash Talk: Dr Mike Thomas, Centre of Excellence Lead, Morgan Advanced Materials
10:50	ZEST - Li Battery fibers and maximising Industrial - Academic collaboration
10:50-	Panel Discussion: What might the future state of academic and industrial collaboration look like?
11:30	- Dr Jerry Barker, Founder and CEO, Redoxion
	- Dr Julius Butime, Dean - School of Computing and Engineering Sciences, Strathmore University
	- Dr Ben de Laune, R&D Strategic Partnerships Manager, Agratas
	- Professor Serena Margadonna, Chair of Chemical Engineering, Swansea University
	- Dr Mike Thomas, Morgan Advanced Materials
	- Dr Dhammika Widanalage, Head of Battery Modelling, Breathe Battery Technologies

12:00-	Lunch and Exhibition
13:30	Ground Floor Atrium

13:30- | Closing Keynote Panel Discussion – Battery Roadmaps | The Theatre, First Floor

14:20 Chaired by: Dr Thomas Bartlett, Deputy Director – Faraday Battery Challenge, Innovate UK

This final session will showcase the battery future development from an academic, government and industry lens, covering EU, Asia and US if possible, and will:

- Set the scene with UK battery landscape, cross sector demand and development targets.
- Cover new developments driven by regulations (Rules of Origin, EU passport)
- Discuss EU opportunities and shine a focus on possible future development

Panellists:

- Dr Carmen Cavallo, Senior Research Scientist, R&D, FAAM
- Bozorg Khanbaei, Policy Officer, BEPA





	 Dr Hadi Moztarzadeh, Head of Technology Trends, Advanced Propulsion Centre Dr Tim Powell, Transport Sector Lead, STFC Hartree Centre Rebecca Schapira, Deputy Director for Advanced Manufacturing, Department for Business and Trade (DBT) Dr Ulderico Ulissi, Head of Overseas Tech & Startup Cooperation, CATL
14:20- 15:00	Closing Keynote Talk The Theatre, First Floor Professor Paul Monks, Chief Scientific Advisor, Department for Energy Security and Net Zero (DESNZ) Getting to Net Zero: what's in store for batteries? Chained by Professor Months From CFO Founday Institution
15:00- 15:20	Chaired by: Professor Martin Freer, CEO, Faraday Institution Poster Awards Presentation The Theatre, First Floor
15:20- 15:45	Closing Remarks The Theatre, First Floor Professor Martin Freer, CEO, Faraday Institution