

Advanced Battery Technologies for Consumer,  
Automotive & Grid Applications

42<sup>nd</sup>  
Annual

# International Battery

SEMINAR & EXHIBIT

March 17-20, 2025

Loews Royal Pacific Resort  
Orlando, FL

LONGEST  
RUNNING  
ANNUAL  
BATTERY  
EVENT

Cambridge  
EnerTech

## 2025 CONFERENCE PROGRAMS:



R&D

- Next-Generation Battery Research
- Battery Recycling
- Lithium-ion Battery Development & Commercialization



MANUFACTURING

- High-Performance Battery Manufacturing
- Global Supply Chain for Battery Raw Materials
- Global Battery Manufacturing Production



APPLICATIONS

- Advances in Automotive Battery Applications
- Grid-Scale Energy Storage
- Battery Power for Consumer Electronics



ENGINEERING

- Battery Safety
- Fast Charging & Infrastructure
- Battery Engineering

## PLENARY KEYNOTES:



### Can We Have a Safe Lithium-Metal Battery?

Shirley Meng, PhD, Argonne National Laboratory & The University of Chicago



### The Importance of Passive Propagation Resistance in Battery Pack Design

Troy Hayes, PhD, Director of Quality, Tesla



### A Comprehensive Analysis of Modern Silicon-Carbon Nanocomposite Negative Electrode Materials for Li-ion Batteries

Jeff Dahn, FRSC, PhD, Dalhousie University



### This and Next-Generation Battery Development - A UK Perspective

Martin Freer, PhD, CEO, Faraday Institution

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# PLENARY KEYNOTE PROGRAM



## 3:55 Can We Have a Safe Lithium-Metal Battery?

**Shirley Meng, PhD, Director, Energy Storage Research Alliance (ESRA), Argonne National Laboratory; The Liew Family Professor, The University of Chicago**

Along the pathway beyond 500 Wh/Kg, enabling lithium-metal anodes becomes a must. In this talk, I will introduce a new framework with which we can design lithium-metal anodes not only for high energy and long cycling, but also for safe operation. The design rule for possible anode-free architecture will also be discussed.



## 4:15 pm The Importance of Passive Propagation Resistance in Battery Pack Design

**Troy Hayes, PhD, Director of Quality, Tesla**

More than 30 years after the first Li-ion battery was produced, random thermal runaway events still occur in the field. Despite the low probability of such incidents at the cell level, the volume of cells in EVs dictates that manufacturers must prepare for these occurrences. Ensuring that this does not create a significant risk to vehicle occupants is crucial and is a fundamental aspect of battery pack design. This talk will discuss the importance of passive propagation resistance and the rigors of testing given the stochastic nature of Li-ion battery thermal runaway.



## 4:45 pm A Comprehensive Analysis of Modern Silicon-Carbon Nanocomposite Negative Electrode Materials for Li-ion Batteries

**Jeff Dahn, FRSC, PhD, Professor of Physics and Atmospheric Science, NSERC/Tesla Canada Industrial Research Chair, Canada Research Chair, Dalhousie University**

There is a huge world-wide push to develop and manufacture modern Silicon:Carbon nanocomposite materials (Si:C) for Li-ion batteries. There are a handful of companies in the US (e.g. Sila, Group 14, etc.), several in Europe as well as OVER 70 companies in China developing and/or manufacturing such materials. Why is this happening? In this lecture I will describe the structure and properties of modern Si:C materials and show why they are so attractive compared to earlier alternatives. The best materials show specific capacities near 2000 mAh/g, first cycle efficiencies near 90%, very little irreversible swelling during charge-discharge cycling and compatibility with simple binders like CMC/SBR. The best materials can be used with typical Li-ion battery electrolytes with common electrolyte additives. We will show results for Li-ion pouch cells containing 20% and 50% by weight of Si:C (balance graphite) where impressive cycle life has been achieved. Energy density increases over "graphite-only" cells are very significant. All the Si:C materials we have tested show large REVERSIBLE volume changes which means that significant care must be taken in cell design.



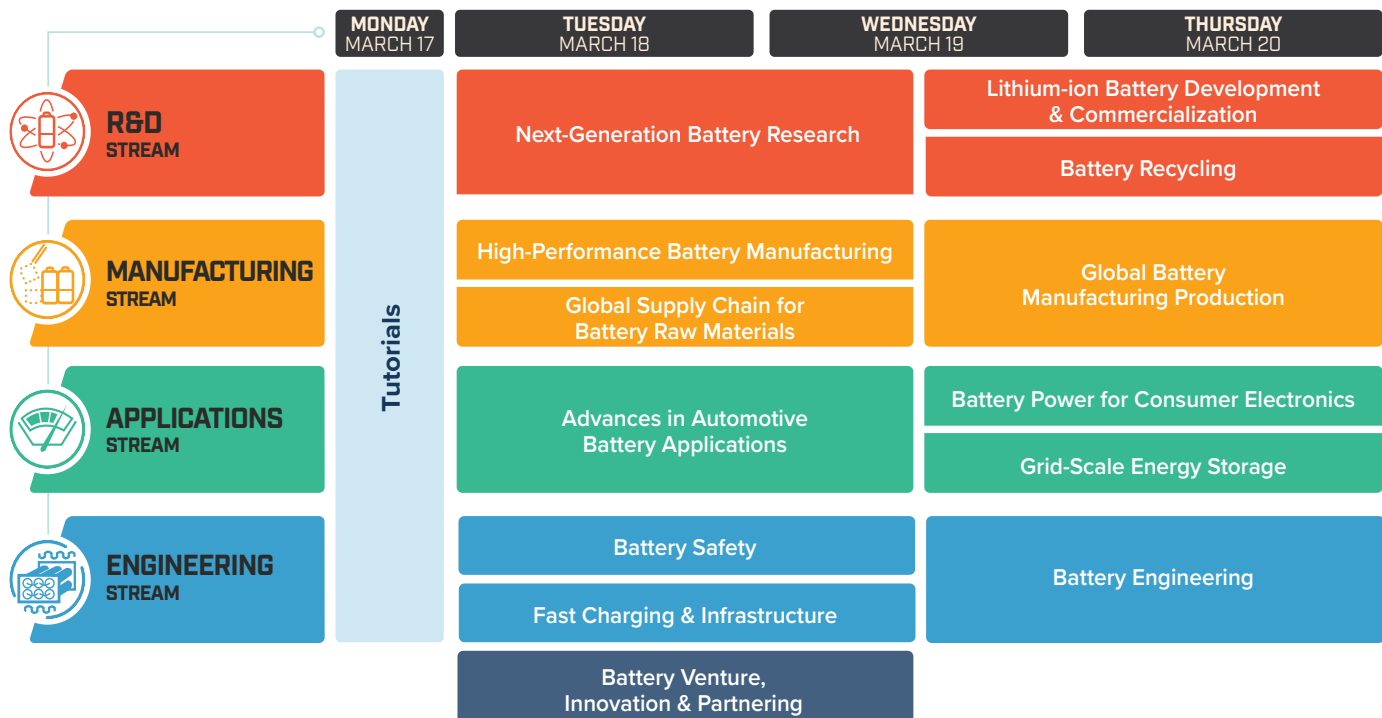
## 5:05 pm This and Next-Generation Battery Development - A UK Perspective

**Martin Freer, PhD, CEO, Faraday Institution**

The UK government set out a battery strategy in 2023 targeting the three elements, including design and development of the batteries of the future as well as strengthen the resilience of UK manufacturing supply chains and enabling the development of a sustainable battery industry. This is matched by a significant delivery program associated with the Faraday Battery Challenge, including the Faraday Institution which coordinates the UK's battery research program. This presentation will provide an overview of the UK's battery strategy, the development of associated research programs, and highlight future focus areas for research and innovation.

## 2025 Conference Programs:

March 17-20, 2025



# INTERACTIVE TUTORIALS\*

## MONDAY, MARCH 17 8:30-10:00 AM

### TUT1: Na-ion Batteries: Materials and State of the Art [instructor will be presenting virtually]

Instructor:

Philipp Adelhelm, PhD, Professor, Institute of Chemistry, Humboldt-University Berlin

### TUT2: Battery Safety & Abuse Tolerance Validation

Instructor:

Shmuel De-Leon, CEO, Shmuel De-Leon Energy Ltd.

### TUT3: Economics of Battery Material Development & Manufacturing

Instructor:

Thomas D. Gregory, Owner and Consultant, Borealis Technology Solutions LLC

### TUT4: In-Depth Analysis of the Chinese xEV Battery Industry [instructor will be presenting virtually]

Instructor:

Mark Lu, PhD, Senior Industrial Analyst, Industrial Economics & Knowledge Center, Industrial Technology Research Institute

## MONDAY, MARCH 17 10:30 AM-12:00 PM

### TUT5: Solid-State Batteries [instructor will be presenting virtually]

Instructor:

Venkataraman Thangadurai, PhD, Chair in Energy & Faraday Institution; Adjunct Professor, School of Chemistry, University of St. Andrews

### TUT6: Technical Approaches to Li-ion Battery Recycling

Instructor:

Eric Gratz, PhD, Co-Founder & CTO, Ascend Elements

### TUT7: Understanding the Future of Battery Cell Cost & Assessing the Economic Feasibility of Emerging Technologies

Instructors:

Beatrice Browning, Senior Recycling Analyst, Benchmark Mineral Intelligence

Rory McNulty, Product Director (New Technology), Benchmark Mineral Intelligence

### TUT8: Cell & Pack Design

Instructor:

Kevin Konecky, Vice President, Battery Systems Engineering, Ola Electric

## MONDAY, MARCH 17 1:30-3:00 PM

### TUT9: Improving the Energy Density of Batteries with Silicon-Based Anodes

Instructor:

Dee Strand, PhD, CSO, R&D, Wildcat Discovery Technologies, Inc.

### TUT10: Li-ion Cell Design and Manufacturing

Instructor:

James Kaschmitter, CEO, SpectraPower LLC

### TUT11: Li-ion Battery Safety & Thermal Runaway

Instructor:

Ahmad Pesaran, PhD, Advisor, Heat Sync

### TUT12: Recycling Market & Methods

Instructor:

Steve Sloop, PhD, President, OnTo Technology LLC

## MONDAY, MARCH 17 3:15-4:45 PM

### TUT13: Latest Regulatory and Legislative Developments on the Safe Transport, Storage, Collection & Recycling of Lithium Batteries

Instructor:

Marcus Boolish, Policy Advisor, Wiley Rein LLP, PRBA Rechargeable Battery Association

### TUT14: Virtual Analysis of Cell Aging and Cell Behaviors for the Selection and Development of Long-Life Cells

Instructor:

Luke Hu, Co Founder & GM, Global Business, Electroder Ltd.

### TUT15: Global EV Market Demand: In-Depth Insights, Future Projections & the Impact on the Battery Supply Chain

Instructors:

Viktor Irle, Co-Founder & Market Analyst, EV Volumes

Rob Price, Global Key Account Manager, EV Volumes

\*All Access Registration or separate registration required for Tutorials

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R&D STREAM

MARCH 18 - 19, 2025

# Next-Generation Battery Research

Powering Higher Performance and Energy Density through Electrochemical Engineering

## MONDAY, MARCH 17

7:00 am Registration and Morning Coffee

4:45 pm Close of Day

## TUESDAY, MARCH 18

7:00 am Registration Open and Morning Coffee

### INCREASING ENERGY DENSITY: ELECTROCHEMISTRIES

#### 7:55 Organizer's Remarks

Mary Ann Brown, Executive Director, Conferences, Cambridge EnerTech

#### 8:00 Chairperson's Remarks

Karim Zaghib, PhD, Professor, Chemical & Materials Engineering, Concordia University



#### 8:05 FEATURED PRESENTATION: New Chemistries for the Electrification of Heavy-Duty Applications (PROPEL-1K Program)

Halle Cheesman, PhD, Program Director, Advanced Research Program Agency, U.S. Department of Energy

(ARPA-E)

For batteries to contribute in the electrification of planes, trains, and ships, a new generation of ESS will be required. ARPA-E has funded next-generation technologies including silicon, solid-state, sodium-ion, and iron-Air, and last July embarked upon a new journey to explore electrochemistries that could achieve 1000Wh/Kg and 1000Wh/L. This presentation will discuss the rationale for this program and highlight its Lithium Air, rechargeable LiCFx, and aluminum projects.

#### 8:30 Realizing the Full Potential of Conductive Additives to Maximize Battery Performance

Ana Kiricova, Director, Commercial Development, Batteries, Orion Engineered Carbons LLC

Conductive carbon blacks are essential in nearly all commercial batteries, enhancing conductivity at the electrode level. Despite their small proportion within the battery, their structural and surface properties significantly influence overall performance. However, inadequate integration of these materials can lead to suboptimal results, limiting battery efficiency and reliability.

#### 8:55 Understanding Charge Distribution in Multivalent Batteries

Jeffrey E. Dick, PhD, Richard B. Wetherwill Associate Professor, Chemistry, Purdue University

Our research examines the electrochemical behavior of aqueous zinc metal batteries (AZMB), focusing on the pathways of electrons at current collectors during charging. We aim to elucidate the factors that determine an electron's fate, as it can participate in zinc electrodeposition, form a passivation film or solid electrolyte interphase, or engage in the hydrogen evolution reaction. These processes are inherently complex and interconnected, presenting significant challenges for understanding charge distribution.

#### 9:20 Managing Electromechanical Heterogeneity in Solid-State Batteries

Shou-Hang Bo, PhD, Professor, Global Institute of Future Technology, Shanghai Jiao Tong University

In contrast to solid-liquid electrochemical interfacial processes, solid-state batteries must cope with heterogeneous solid-solid interfaces under mechanical constraints. In this talk, I will discuss the development of ultrafast XCT, photoacoustic microscopy, and confocal Raman microscopy, to directly visualize the dynamic evolution of physicochemical fields. An electrode-adaptive Real 2D (R2D) modeling strategy will also be introduced. These lead to innovative ways to manage and control heterogeneity, thus improving electrochemical performance.

#### 9:45 Grand Opening Refreshment Break in the Exhibit Hall with Poster Viewing

### INCREASING ENERGY DENSITY: CATHODES

#### 10:30 Enabling High Performance Cathode Materials with Conformal Graphene Encapsulation

Damien Despinoy, CEO and Co-Founder, Volexion

A novel, scalable, conformal graphene encapsulation solution, co-developed at Argonne and Northwestern University, allows enhanced control of the material/electrolyte interface of Cathode Active Materials (CAM) thanks to a pinhole-free thin graphene layer. It improves cycle life, gassing, rate capability, and voltage and temperature range. This solution also enables next-generation CAM such as earth-abundant chemistries, offering wide temperature operability and immediate usability in existing production lines.

#### 11:00 Ultrastable Cathodes Enabled by Compositional and Structural Dual-Gradient Design

Tongchao Liu, PhD, Assistant Chemist, Chemical Sciences and Engineering Division, Argonne National Laboratory

Cathodes for next-gen batteries face challenges at high voltage ( $\approx 4.5V$ ) due to structural degradation and capacity fading. We present a new cathode with a structurally coherent design, merging ordered and disordered frameworks with controllable Ni oxidation activities. This enables high-voltage operation (up to 4.7V) with minimal capacity decay and improved thermal stability. Our approach overcomes the limitations of existing cathodes, offering a breakthrough for long-lasting, high-performance batteries.



#### 11:30 KEYNOTE PRESENTATION: Sustainable C-LiFePO<sub>4</sub> (C-LFP) and C-LiMnxFe<sub>1-x</sub>PO<sub>4</sub> (x=0.1 to 1) (C-LMFP) Cathode Materials for Lithium-ion Batteries

Karim Zaghib, PhD, Professor, Chemical & Materials Engineering, Concordia University

This presentation offers a comprehensive overview of the entire process involved in the fabrication of C-LFP/LMFP-based lithium-ion batteries, from the initial elements in the mine to the assembly of the final systems that power EVs or energy storage. C-LiFePO<sub>4</sub> (C-LFP) and C-LiMnxFe<sub>1-x</sub>PO<sub>4</sub> (x=0.1 to 1) (C-LMFP)-based technologies represent an increasing segment of lithium-ion batteries (LIBs) due to desirable properties such as high safety, low cost, and long cycle life.



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# Next-Generation Battery Research

## 12:00 pm Techniques for Coating Li-ion Battery Electrodes

Scott Zwierlein, Senior Coating Engineer, Applications Engineering, Delta Modtech

This presentation details the equipment needed to coat Li-ion batteries at manufacturing scale. Along with side-by-side comparisons of common coating methods which will include the advantages and disadvantages of each. In addition, a description of some of the latest special techniques developed for advanced Li-ion battery manufacturing.



## 12:15 Characterization of Lithium Ion Battery Materials

Brian Rodenhausen, Lead Scientist, ATS Business Unit Characterization, Anton Paar

Throughout the lithium ion battery production chain, from precursor electrode powders to final cell, material characterization is necessary to ensure intermediates and products are within specification. Anton Paar develops and manufactures premium analytical instrumentation and automated high-throughput testing solutions that are applicable at all stages of production. Examples are numerous and include determination of surface area, particle size, morphology, density, and packing and flow behavior of raw material powders; rheological properties and solids fraction of electrode slurries; adhesion and mechanical properties of electrodes from coating to calendaring to drying; pore size and surface chemistry of separators; density, viscosity, and flash point of electrolytes; and in-situ and in-operando characterization of cells by X-ray diffraction. With a controlled supply chain, high-quality manufacturing, a global footprint, and a broad portfolio of solutions, Anton Paar continues to support manufacturers in the lithium ion battery industry in their efforts to develop novel battery materials and ensure high-quality and consistent final products.



## 12:30 Networking Luncheon

## 1:15 Dessert Break in the Exhibit Hall with Poster Viewing

## INCREASING ENERGY DENSITY: ANODES

### 1:40 Chairperson's Remarks

Celina Mikolajczak, Chief Battery Technology Officer, Lyten

### 1:45 Tackling Lithium Metal Corrosions by Novel Polymeric Coatings

Xiangbo Meng, PhD, Associate Professor, Mechanical Engineering, University of Arkansas Fayetteville

Although very promising, Li suffers from two daunting issues: (1) continuous formation of unstable solid electrolyte interphase and (2) Li dendritic growth. In searching for solutions, recently we developed several novel Li-containing polymers (named as lithicones) via molecular layer deposition. The lithicone-protected Li showed compelling long-term cyclability in Li||Li cells and could dramatically boost the performance of Li||NMC811 (LiNi<sub>0.8</sub>Mn<sub>0.1</sub>Co<sub>0.1</sub>O<sub>2</sub>) cells, in terms of sustainable capacity and capacity retention.

### 2:10 New Class of High-Performance and Highly-Safe Li-ion Cell Enabled by Novel Vanadium-Based Oxide Anode

Haodong Liu, PhD, Co-Founder and CTO, Tyfast Energy Corp.; Activate Fellow, Lawrence Berkeley National Laboratory

We are developing high-performance lithium-ion batteries using a vanadium-based oxide anode for heavy-duty applications such as mining, construction, and military vehicles. By utilizing this proprietary vanadium-based anode, we aim to achieve 10x faster charging (<6 mins to 80%

SOC), 10x the cycle life (>10,000 cycles), and the ability to charge below freezing (-40°C), while also enhancing safety with the use of a metal oxide anode.

### 2:35 Securing the US Battery Supply-Chain via 100% Silicon Anodes to Enable Commercialization of High-Performance Domestic Li-Ion Cells

Rob Anstey, CEO, GDI



### 2:50 Stability, Resiliency and Performance – Unlocking the Promise of Silicon in Graphite-free Li-Ion Batteries

Karthik Ramaswami, CTO, Sionix Energy



Sionix's unique anode/electrolyte design provides the robustness, pore structure and conductive network necessary for extremely high performing 100% Silicon batteries. The innovations overcome all the hurdles preventing widespread adoption of silicon - poor cycle life, excessive expansion & the need for significant external compression. 4, 10 & 20Ah cells demonstrate long cycle life, 370 Wh/Kg (1000 Wh/L), 10-minute fast charge & 5C continuous discharge. Expansion is at parity with graphite! The innovations are accomplished with low-cost, commercial materials & standard Li Ion electrode & cell assembly processes critical to controlling cost.

## 3:20 Refreshment Break in the Exhibit Hall with Poster Viewing

## PLENARY KEYNOTE

### 3:50 Chairperson's Remarks and Presentation of the 2025 Shep Wolsky Battery Innovator Award

Craig Wohlers, General Manager, Cambridge EnerTech



### 3:55 Can We Have a Safe Lithium-Metal Battery?

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Jeff Dahn, FRSC, PhD, Professor of Physics and Atmospheric Science, NSERC/Tesla Canada Industrial

Research Chair, Canada Research Chair, Dalhousie University  
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# Next-Generation Battery Research

Si:C materials and show why they are so attractive compared to earlier alternatives. We will show results for Li-ion pouch cells containing 20% and 50% by weight of Si:C (balance graphite) where impressive cycle life has been achieved.



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*Martin Freer, PhD, CEO, Faraday Institution*

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**5:25 Reception in the Exhibit Hall with Poster Viewing**

**6:30 Close of Day**

## WEDNESDAY, MARCH 19

**6:45 am Registration Open**

## 7:00 Coffee Talk: Interactive Roundtable Discussions with Coffee & Pastries

Roundtable discussions are informal, moderated discussions with brainstorming and interactive problem-solving, allowing participants from diverse backgrounds to exchange ideas and experiences and develop future collaborations around a focused topic.

### TABLE 1: Battery Raw Materials Supply Chain

*Moderator: Robert Privette, Manager, Business Development, Rechargeable Battery Materials North America, Umicore USA, Inc.*

### TABLE 2: Li-ion NMC Fast Charging New Cells for E-Mobility

*Moderator: Shmuel De-Leon, CEO, Shmuel De-Leon Energy Ltd.*

### TABLE 3: Electrolyte Developments: New Components and Approaches

*Moderator: Sam Jaffe, Vice President, Battery Solutions, E Source*

### TABLE 4: Battery Pack System Cost and Safety – Will Future xEV Battery Packs Increase in Complexity or Simplify and How Will Cost and Safety Be Impacted?

*Moderator: Kevin Konecky, Battery and Energy Storage Systems Consultant, Total Battery Consulting*

### TABLE 5: Innovations in Recycling Battery Materials & Second Life

*Moderator: Steven Sloop, President, OnTo Technology LLC*

### TABLE 6: Opportunities and Barriers to Fast Charge in Automotive and Other Applications

*Moderator: Brian Barnett, PhD, President, Battery Perspectives*

### TABLE 7: Provisional Patents to Due Diligence

*Moderator: Grant Ehrlich, PhD, Member, Intellectual Property & Technology, Stites & Harbison PLLC*

### TABLE 8: Understanding the Pressure Effects on Li Metal Batteries

*Moderator: Bin Li, Senior Scientist & Joint Professor, Electrification, Oak Ridge National Laboratory*

### TABLE 9: Challenges and Opportunities in the Distribution of Relaxation Times Analysis

*Moderator: Tom Ruether, Lecturer & Chair, Electrical Energy Systems, University of Bayreuth*

### TABLE 10: How Will Emerging Technologies and Paradigms Impact the Future of Electrified Transportation?

*Moderator: Benny Varghese, PhD, Research Engineer, Energy Storage & Advanced Transportation, Idaho National Laboratory*

### TABLE 11: Battery Testing & Aging

*Moderator: Gerald Sammer, PhD, Principal Business Development Manager, AVL List GmbH*

### TABLE 12: Thermal Runaway

*Moderator: Lin Liu, PhD, Professor, Mechanical Engineering, University of Kansas*

### TABLE 13: Consumer-Driven Trends in Battery Development for Personal Electronics

*Moderator: John Wozniak, PhD, President, ESP Consulting*

### TABLE 14: Battery Electrolytes: Materials, Developments and Manufacturing

*Moderator: Monica Usrey, R&D, Orbia Fluor & Energy Materials*

## INCREASING ENERGY DENSITY: SOLID-STATE BATTERIES

### 7:55 Chairperson's Remarks

*Chen Liao, PhD, Chemist & Staff Scientist, Chemical Sciences & Engineering, Argonne National Laboratory*

### 8:00 Enhance Battery Safety and Performance Through thermal analysis and In-Operando Isothermal Microcalorimetry

*Hang Lau, Segment Marketing Mgr, Segment Marketing, TA Instruments*

Thermal analysis techniques are extremely valuable tools for evaluating the thermal stability of battery materials. The decomposition onset temperature, reaction mechanism, and heat of reaction are essential to improving battery safety by design. At the cell level, In-operando isothermal microcalorimetry can simultaneously measure thermal and electrochemical data for a non-destructive determination of performance and stability. Evaluating the thermal properties of a battery during normal operating conditions is crucial for evaluating performance, gaining a deeper understanding of the chemistry, and studying the mechanisms of failure.

### 8:30 New Composite Polymer Electrolytes for High-Performance Li-Metal Batteries

*Chen Liao, PhD, Chemist & Staff Scientist, Chemical Sciences & Engineering, Argonne National Laboratory*

Polymers can serve as composite materials with oxides to provide unprecedented high ionic conductivity and low interfacial resistance for the all solid-state batteries. Here we introduced two approaches, 1) design of single ion conducting polymer electrolytes (SIE); 2) design of crosslinkers. Significant improvements in Li transference number, electrochemical stability, and cycling life are observed with these designs.

### 9:00 Advancing Low-Cost Manufacturing of Sulfide Solid Electrolytes for High Energy Density All-Solid-State Batteries

*Sumin Zhu, PhD, Co-Founder & CEO, Ampcera, Inc.*

The need for cost-effective manufacturing of high-performance solid electrolytes and high energy density all-solid-state batteries (ASSBs) is critical for the successful commercialization of this transformative technology. This presentation will highlight Ampcera's innovative strategies designed to drastically reduce the cost of producing sulfide solid electrolytes and ASSBs that offer both superior energy density and enhanced safety. Additionally, the importance of forging strategic partnerships throughout the value chain will be discussed.







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# Next-Generation Battery Research

## 9:30 Successful Development of Technology That Increases Maximum Operating Temperature of All-Solid-State Battery to 150 Degrees Celsius

Genyo Kaneko, Chief Engineer, Energy Products OEM Battery Grp, Maxell Corp of America

Focusing on the development and practical application of all-solid-state batteries ensures comprehensive performance such as high safety, high performance, and a wide operating temperature range, and is in a leading position in the fierce all-solid-state battery development competition. Maxell has succeeded in developing technology to raise the upper operating temperature to 150 degrees C. In this presentation, we will introduce this technology together with the evaluation method.



## 10:00 Data Management and AI for the Next-Generation Battery Materials Development

Jacob Mohin, Dir Solutions Engineering, Solutions Engineering, Albert Invent Corp

Capturing the composition, processing, and provenance of novel materials is essential for research and development in advanced battery R&D. In particular, solid state electrolytes have specific dependence on the purity of their raw materials and thermal processing history. This talk will highlight how a comprehensive data management system—the Albert Platform—can track and predict performance of cells from performance testing back to purity of raw materials. This enables researchers to correlate material quality and property differences to battery performance in a harmonized data system. This approach not only offers visibility into how variations in material synthesis affects performance but also supports researchers in complex multi-step processes which are difficult to trace in battery development.



## 10:15 Coffee Break in the Exhibit Hall with Poster Viewing

## INCREASING ENERGY DENSITY: SODIUM-ION BATTERIES

### 11:00 Insights on Sodium-ion Battery Performance from 3-Electrode Cells

Daniel Abraham, PhD, Senior Materials Scientist, Argonne National Laboratory

Sodium-ion batteries are gaining increased attention due to considerations that include their cost-effectiveness, sustainability, and supply-chain resilience. In this presentation we will discuss insights from 3-electrode cell experiments being conducted at Argonne National Laboratory using layered-oxide cathodes, hard-carbon anodes, and carbonate-based electrolytes. Performance characteristics such as cell capacity fade, impedance rise, voltage-profile changes and the effect of hard-carbon hysteresis and sodium-plating during electrochemical cycling will be discussed.

### 11:30 Advanced Sodium-ion Batteries & Pathways to High-Energy Density

Darren Tan, PhD, CEO, UNIGRID Battery

Through a breakthrough alloy anode innovation, the energy densities of sodium-ion batteries can be increased by a factor of 2x and avoid battery safety hazards, offering competitive advantages in e-mobility and energy storage markets. This session will showcase datasets from state-of-the-art commercial scale sodium ion-batteries, with unprecedented energy densities, performance, and safety testing results of U.S.-developed advanced sodium-ion batteries.

## 12:00 pm Chemo-Mechanical Instabilities in Cathode Materials for Na-ion Batteries

Ozgur Capraz, PhD, Associate Professor, Chemical, Biochemical & Environmental Engineering, University of Maryland Baltimore County

Na-ion cathodes undergo severe chemo-mechanical deformations, which lead to poor capacity retention. Chemo-mechanical deformations can originate from interfacial and structural instabilities. There is a critical scientific need for a comprehensive understanding of the reaction-transport behavior and mechanics of cathodes in Na-ion chemistry. I will present instability mechanisms in battery electrodes by probing operando mechanical deformations during cycling.

## 12:30 Technological Breakthrough Driven by Electrolyte with High Ionic Conductivity

AsahiKASEI

Hirokazu Kamine, Asahi Kasei Corporation

We present the proof-of-concept (POC) of a lithium-ion battery (LIB) featuring a proprietary high ionic conductive electrolyte developed by Asahi Kasei. Our novel electrolyte significantly outperforms conventional ones, with cells showing superior power at -40°C and doubled cycle life at 60°C before reaching a state-of-health (SOH) of 80%. The use of our electrolyte enhances ionic conductivity and prevents degradation, thus improving battery longevity and performance.

## 12:45 Accelerating Battery Data Analytics with Micantis



Mykela DeLuca, Product Manager, Micantis

Understanding battery performance and accelerating lifecycle predictions is becoming increasingly important as demand for battery technology grows. Industries ranging from electric vehicles to grid storage depend on reliable, long-lasting batteries; however, accurately analyzing battery data remains a significant challenge because of issues like noisy data, multiple data sources, and feature extraction. Micantis addresses these challenges by providing customers with a centralized platform for battery data analytics to streamline data integration, accessibility, cleaning, stitching, and feature extraction. With Micantis, researchers and manufacturers can accelerate battery analytics, gain deeper insights, and make data-driven battery decisions faster.

## 1:00 Networking Luncheon

## 2:15 Dessert Break in the Exhibit Hall with Poster Viewing

## 2:45 Close of Conference





R&amp;D STREAM

# Battery Recycling

Advanced Recycling Methods for Sustainable Battery Materials Supply

MARCH 19 - 20, 2025

## WEDNESDAY, MARCH 19

**6:50 am Registration Open****1:00 pm Networking Luncheon****2:15 Dessert Break in the Exhibit Hall with Poster Viewing**

## MARKET DEMAND FOR RECYCLING

**2:40 Organizer's Remarks***Craig Wohlers, General Manager, Cambridge EnerTech***2:45 Chairperson's Remarks***Steve Sloop, PhD, President, OnTo Technology LLC***2:50 FEATURED PRESENTATION: ReCell Center: Advances in Battery Recycling Technologies***Eva Allen, PhD, Materials Scientist, Applied Materials Division, Argonne National Lab*

The ReCell Center, funded by the Department of Energy—Vehicle Technologies Office, has continued to pursue the advancement of lithium-ion battery recycling technologies. This presentation will cover some of the exciting new technologies that have been developed in ReCell, and the deployment of the pilot-scale recycling facility at Argonne National Laboratory.

**3:20 End-of-Life Management for Battery Energy Storage Systems***Stephanie Shaw, PhD, Technical Executive, EPRI*

This talk will share lessons learned from several case studies of utility-scale battery energy storage decommissioning and recycling. Examples of logistical requirements, cost estimation, and recycling markets will be described. A tutorial of decommissioning planning will also be provided, along with insights gained from decommissioning damaged, defective, and recalled (DDR) battery modules. Research needs for repurposing opportunities from the point of view of electric power companies will be shared.

**3:50 Market Forces and Technical Advances Continue to Drive Recycling Demand***Chao Yan, CEO, Princeton NuEnergy*

Although there has been much concern about recent EV adoption rates, market growth continues because EVs are broadly and simply a "better mousetrap" for most people. EVs are not going away. Advances in range, reductions in cost, and improvements in battery chemistries will continue to drive further adoption. Growing power demands for AI-enabled services require grid stability—an area where battery storage excels. Grid storage is expected to grow even faster in the coming years. Each of these applications will create significant opportunities for material conservation as they reach the end of their lifecycle. With the stability of global markets for critical materials—such as cathodes, anodes, and rare earth elements—remaining uncertain, recycling is more essential than ever. PNE will share updates on the latest research advances in direct recycling, which continue to outpace traditional technologies.

**4:05 Maximizing Battery Recycling Efficiency***Cesar Ballester, ELTRA Business Unit Manager, Sales & Applications, VERDER SCIENTIFIC INC**Yannick Hutson, Verder Scientific Inc*

Fractionizing through Sieving and Homogenization, alongside Carbon/Sulfur Determination & Thermogravimetric Analysis, are vital in battery

recycling. Sieving ensures particle size uniformity for accurate material characterization. Determining carbon and sulfur content is essential for evaluating material purity and performance, impacting thermal and mechanical properties.

**4:20 Refreshment Break in the Exhibit Hall with Poster Viewing and Best of Show Winner to be Announced****5:00 Advancing Sustainability: Battery Materials Technology for a Greener Future***Tomasz Poznar, Vice President, Strategy, Ascend Elements*

As Electric Vehicle (EV) OEMs and battery manufacturers strive to secure their battery supply chains and achieve IRA compliance to advance EV adoption, integrating recycled critical minerals offer a vital solution (compared to reliance on mining alone). Critical minerals used for new battery materials production from recycled sources are IRA-compliant and are infinitely recyclable, without compromising on performance. Based on current projections, future availability of these critical minerals is limited and production capacity for pCAM and CAM is expected to fall short of forecasted needs, intensifying supply-chain stress through 2030. This presentation will explore the recycling and circular economy in battery manufacturing, including life-cycle assessments of different battery materials, eco-friendly alternatives, and the evolving policy landscape in the U.S. and Europe.

**5:30 Critical Battery Metals Market Outlook***Kirstyn Petras, Senior Reporter, Pricing, Fastmarkets*

This presentation will cover battery supply chains and the role of black mass and battery recycling as countries' electrification efforts. For the US, this will include efforts pertaining to adherence to IRA guidelines, BIL investments, and other legislative efforts. The presentation will also examine the state of black mass markets and its current drivers across Asia, Europe, and the US.

**6:00 Financing Fleet Electrification: Battery-Electric Truck Component Resale Highlights Residual Value Upside***Katelyn Tomaszewski, Project Manager, CALSTART*

EV battery remanufacturing for second-life applications can provide a significant upside to EV leasing and financing. Residual value risk is a critical barrier facing battery-electric vehicle financing. This RV benchmark is a great starting point for structuring incentives for second-life EV battery deployment, which not only improve BET financing but also accelerate the circular economy for EV batteries and other components

**6:30 Close of Day**

## THURSDAY, MARCH 20

**8:00 am Registration and Morning Coffee**

## RECYCLING METHODS

**8:25 Chairperson's Remarks***Eric Frederickson, Managing Director of Operations, Call2Recycle***8:30 Building a Domestic Supply Chain to Scale***Dominic Brown, Business Director, Commercial, Cirba Solutions*

The demand for critical materials that are essential to battery manufacturing are experiencing a robust growth. Cirba Solutions will dive into the market outlook for batteries and EVs, the journey of critical materials, delivering products and services to a growth sector, and



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# Battery Recycling

building the new source of critical materials for domestic independence. Increasing the supply of critical materials sourced in North America is crucial to national security, the pursuit to reduce carbon emissions, goals around building a closed-loop supply chain, and enhancing the circular economy.

## 9:00 Characterization of Process Water from Lithium-ion Battery Recycling

Sascha Nowak, PhD, Head of Analytics & Environmental, Electrochemical Energy Technology, University of Münster

Water-using recycling processes—such as wet crushing and electrohydraulic fragmentation—generate large amounts of contaminated process water, resulting in increased costs for the disposal of hazardous waste and safety guidelines. To improve wastewater management, safety, and sustainability of water-assisted recycling processes, comprehensive knowledge of the battery components in the water are required. Analytical techniques can play an important role during these processes, including wet shredding processes, wastewater management, and analytical techniques.

## 9:00 Battery Booth Crawl with Bagels in the Exhibit Hall with Last Chance for Poster Viewing

### 9:30 XES BATTERY RECYCLE CONCEPT

John Liu, XPERT EQUIPMENT SOLUTIONS

XES is an expert in powder processing, and we are also dedicated to the cause of battery recycling.



## 9:45 On-Line Elemental composition of Black Mass and Mixed Metals for Li-ion Battery Recycling. Getting real-time data when and where you need it most.

Rajendra Mishra, Product Mgr, Malvern Panalytical

Monitoring black mass materials, from OEM scrap to end-of-life batteries, is crucial for optimizing Li-ion battery recycling operations. The elemental composition of these materials can vary significantly based on formulation (NMCs, LFPs), source (closed-source versus open-source), size, type, and region. An effective solution to address this variability is the use of an on-belt PTNFA analyzer, which can identify the elemental composition of materials in real-time. In this talk, we will explore the PTNFA system and discuss how it reports data to enhance operational efficiency.



## 10:00 Attendee Transition to Booth Crawl in Exhibit Hall

## 10:45 Battery Services for Economic and Environmental Sustainability

Steve Sloop, PhD, President, OnTo Technology LLC

Steve will discuss service strategies to improve the cost and environmental sustainability of batteries. The oil change for the future—battery rejuvenation, elimination of hazards with neutralization, and cathode healing direct recycling of materials will support the low-cost, long-battery lifetimes required for mass adoption of EVs.

## 11:15 Blockchain Solution for Improving Li-ion Batteries Recycling and Material Recovery

Ahmad Mayyas, PhD, Professor, Industrial & Systems Engineering, Khalifa University

This study proposes a blockchain-based solution to optimize the recycling process of lithium-ion batteries, addressing critical challenges in battery lifecycle management as demand surges due to their role in electric vehicles and renewable energy systems. Leveraging blockchain

technology and non-fungible tokens (NFTs), the solution enhances traceability, transparency, and efficiency in the battery supply chain.

## 11:45 Recycling of battery grade graphite

Stefan Bergold, Chief Commercial Officer, Vianode

Vianode

Electric vehicles reduce CO2 emissions while driving to zero. For the overall CO2 balance, also the manufacturing process must be considered. Especially the anode of the battery can result in high CO2 emissions during manufacturing. This presentation discusses how Vianode is manufacturing high volume competitive anode materials with state of the art performance in North America and Europe. The Vianode proprietary production process offers a substantial improvement in product consistency, energy efficiency, CO2 and other emissions. Vianode's first large scale plant in Norway opened in 2024 and a full scale production plant in North America is under construction and will have SOP in 2027.

## 12:15 pm Enjoy Lunch on Your Own

## RECYCLING METHODS

### 1:10 Chairperson's Remarks

Barry A. Perlmutter, President, Perlmutter & Idea Development (P&ID) LLC

### 1:15 Selection of Process Drying Technology for Maximum Black Mass and Electrolyte Recovery

Barry A. Perlmutter, President, Perlmutter & Idea Development (P&ID) LLC

The drying process is fundamental in chemical process engineering for solids handling. The term "drying" usually refers to the thermal removal of a liquid from a solid product. After mechanical shredding of the lithium-ion battery, process vacuum drying is critical for maximum black mass and other solids recovery and for electrolyte recovery. Dryer technologies are discussed including surrounding ancillary equipment, installation, safety, reliability, and troubleshooting.

### 1:45 Li Onsite De-Energizing BESS Failed or End-of-Life Batteries

Kevin Howlette, Director of Projects, IFE Fire Command and Control, Safety, EHS International

We have developed a global process that involves safely discharging and isolating the battery from the power grid and mitigating risks of electrical shock, fire, or chemical hazards. Proper decommissioning includes following strict protocols, utilizing specialized tools, and often engaging experts to manage the safe disposal or recycling of the battery components.

### 2:15 The Emerging Landscape of Battery Collections

Eric Frederickson, Managing Director of Operations, Call2Recycle

Join Eric Frederickson, the Vice President of Operations for Call2Recycle, North America's oldest and largest battery stewardship program, as we explore the rapidly changing landscape of battery collection in the United States. Eric will review battery collections in the United States, how and why the models are changing, and what impacts that will have on producers, recyclers, and users of batteries and battery powered devices.

### 2:45 Introduction to a Novel Pyromet Process for Recycling Spent Lithium-ion Batteries

Jong-Hoon Kang, PhD, Senior Researcher, LiB Recycling Research Center, POSCO Holdings, South Korea

Recycling of spent LiB is a critical task for environmental protection and resource conservation. Recently, several novel processes have been developed for more effective and sustainable recycling of waste batteries. We would like to introduce a new concept of an eco-friendly and efficient recycling.

**3:15 Transition to Closing Plenary Panel****CLOSING PLENARY PANEL DISCUSSION****3:30 The Global Battery Industry Landscape: Opportunities & Illusions**

*Moderator: Christina Lampe-Onnerud, PhD, Founder and CEO, Cadenza Innovation*

As the global battery industry experiences supercharged growth amidst shifting political dynamics, it faces both immense opportunities and significant challenges. This international panel of experts, spanning critical sectors such as investment, supply chain, cell design, manufacturing and deployment, will share their insights on the industry's future. They will discuss growth prospects, key challenges, and achievable milestones in the near and long term.

*Panelists:*

*Oliver Gross, MSc, SME Energy Storage and Conversion, Advanced Propulsion Technology, Stellantis*

*Joern Tinnemeyer, Senior Vice President & Chief Technology Officer, EnerSys*

*Tracy Mckibben, Founder and CEO, MAC Global Partners*

*William Acker, PhD, Executive Director, New York Battery & Energy Storage Technology Consortium*

**4:30 Close of Conference**



# Lithium-ion Battery Development & Commercialization

Bridging the Gap between Benchtop Research and Industrial Development

## WEDNESDAY, MARCH 19

**6:50 am Registration Open**

**1:00 pm Networking Luncheon**

**2:15 Dessert Break in the Exhibit Hall with Poster Viewing**

### SOLID-STATE SOLUTIONS

**2:40 Organizer's Remarks**

*Mary Ann Brown, Executive Director, Conferences, Cambridge EnerTech*

**2:45 Chairperson's Remarks**

*Marina Yakovleva, Director, R&D and New Business Development, Rio Tinto*

**2:50 Self-Healing Solid-State Separators Enable the World's Fastest Lithium Metal Batteries**

*William Fitzhugh, PhD, Co-Founder & CEO, Adden Energy*

For lithium metal solid-state batteries, the presence of defects in the solid-state separator serve as an avenue for dendrite penetration and internal short circuit. As such defects are unavoidable when manufacturing large-scale batteries, new approaches are needed to prevent dendrite penetration. This talk will discuss the use of self-healing separators, where defects are healed passively during cycling, to achieve increased defect tolerance during production and better performance in operation.

**3:20 From Lab Research to Commercialization: High-Voltage, High-Energy-Density, Low-Cost (Co-Free) Solid-State Batteries**

*Tim Lin, PhD, CTO and Founder, Solid Energies*

Integrating a Co-free/Ni-less LNMO cathode combining with a polymer composite solid electrolyte presents a compelling avenue for development of more-advanced solid-state Li-ion batteries (SSLiBs). This class of SSLiBs, which can be produced with a low-cost, scalable process compatible with current Li-ion manufacturing, is featured with high operation voltage, high energy density, excellent safety, and wide operation temperature. This presentation reviews challenging issues and recent advancement from lab R&D to commercialization.

**3:50 Applications of NOVONIX Ultra-High Precision Coulometry Across the Battery Supply Chain**



*Stephen Glazier, Dir Technology, NOVONIX*

NOVONIX is a leading domestic lithium-ion battery materials manufacturer, R&D Service provider, and supplier of Ultra High Precision Coulometry (UHPC) cell testing equipment - the most precise and accurate technology available. UHPC was born in Dr. Jeff Dahn's lab at Dalhousie University and has evolved at NOVONIX Battery Technology Solutions over the past 10 years. In this talk we will discuss the ways in which UHPC can be leveraged to accelerate development across the entire battery supply chain, providing case studies from upstream applications in materials development to downstream processes such as manufacturing QC, lifetime prediction, and even exploring the effects of in-field cell orientation.

**4:20 Refreshment Break in the Exhibit Hall with Poster Viewing and Best of Show Winner to be Announced**

**5:00 Making Pressure Irrelevant in Fully Dry Silicon Solid-State Batteries**

*Priyanka Bhattacharya, PhD, Senior Manager, R&D, Blue Current Inc*

Blue Current introduces its pioneering work on fully dry solid-state

batteries featuring silicon-based anodes and flexible composite electrolytes. The presentation will provide a detailed exploration of Blue Current's pouch cell performance capabilities, focusing specifically on low-pressure operation that is key for the commercialization of fully dry cells. We will also highlight aspects of the innovative process implemented at the company's 1-2 MWh pilot facility in Hayward.

**5:30 Injectable Phase Change Electrolytes as a Scalable Path Towards Solid- and Semi-Solid-State Batteries**

*David Mackanic, PhD, Co-Founder and CEO, Anthro Energy*

Anthro's Injectable Phase Change Electrolyte (IPCE) allows for the production of solid and semi-solid state batteries without changing any manufacturing equipment. This presentation showcases the advantages of IPCE compared to traditional liquid electrolytes with respect to safety, swell, cycle life, and temperature stability in commercially relevant multi-Ah pouch cells. Further, IPCE stabilizes next-generation chemistries such as silicon anodes, reducing capacity fade and calendar aging.

**6:00 Rapid Thermal Processing of Solid-State Lithium Battery Ceramic Electrolyte Materials**

*Harry Chou, PhD, Senior Applications Engineer, Applications Engineering, PulseForge Inc*

We are highlighting recent key battery technology advancements made using PulseForge flashlamp-based thermal processing tools, including processing of solid-state lithium battery ceramic electrolyte materials within seconds at room temperature. These tools have been used in production for over a decade, and unexpected processes such as soldering on PET have become the new norm. We'll review the state of the art plus look at the reductions in energy use and cost of operation.

**6:30 Close of Day**

## THURSDAY, MARCH 20

**8:00 am Registration and Morning Coffee**

### TECHNO-ECONOMIC INNOVATIONS FROM BENCHTOP RESEARCH TO INDUSTRIAL DEVELOPMENT

**8:25 Chairperson's Remarks**

*Feng Lin, PhD, Professor, Chemistry, Virginia Tech*

**8:30 Maximizing Accuracy in Electrochemical Impedance Spectroscopy (EIS): Addressing Common Errors and Measurement Challenges.**

*Ihsan Dalgic, Chief Application Engineer, Hioki USA*

Electrochemical Impedance Spectroscopy (EIS) is a powerful technique for understanding the internal electrochemical processes in lithium-ion batteries, providing critical insights for research, production, and quality control. However, achieving accurate EIS measurements requires overcoming several challenges, including the effects of wiring configurations, eddy currents, magnetic field interference, and measurement offsets. This presentation explores advanced methodologies to enhance measurement accuracy, focusing on the four-terminal pair method, proper return cable routing, and zero adjustment techniques. By addressing these issues, we demonstrate how to minimize common error sources and ensure reliable and reproducible data, empowering both novice and experienced users to leverage EIS effectively in various applications.





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# Lithium-ion Battery Development & Commercialization

## 9:00 Composite Lithium Metal Anode and Performance Benefits Explained

Marina Yakovleva, Director, R&D and New Business Development, Rio Tinto

## 9:00 Battery Booth Crawl with Bagels in the Exhibit Hall with Last Chance for Poster Viewing

## 9:30 Low-Cost and Abundant Metallurgical Si Anodes for EVs

Roger Basu, CTO, Coreshell

Metallurgical Silicon (MG-Si) is an abundantly found and low-cost form of silicon. The advantages of this material is that it is produced widely in North America + Europe, allowing diversification away from Chinese manufactured graphite to establish domestic supply chains, increases the energy density of the cell (10x specific energy of graphite) allowing for lighter and smaller batteries, and dramatically reduces the total cost of the battery system.

## 10:00 Attendee Transition to Booth Crawl in Exhibit Hall

## 10:45 Recent Innovations to Improve Sustainability of Batteries: A Journey from Materials to Pack Design

Sebastien Patoux, PhD, Head of Battery, LITEN, CEA

In this communication, we will present our recent works on battery technologies, especially under the prism of sustainability. Our journey will cover materials to the system, including not only Li-ion, but also post Li and non-Li battery technologies. We will consider, among other things, the solutions with less critical raw materials, less solvent for electrode processing, simplified pack design consideration for easier dismantling and longer lifetime.

## 11:15 Selected Poster Presentation: Nanocomposite Cathode Design and Electrolyte Engineering for High-Performance Zinc-Ion Structural Battery Composites

Leaford Nathan Henderson, PhD, Researcher, Materials Science & Engineering & NanoScience Technology, University of Central Florida

## 11:30 Selected Poster Presentation: Rapid and Scalable Method for Producing Graphene-Coated Silicon Microparticles

Bradley Kroes, Chemistry Ph.D. Student, Kaner Research Laboratory, Department of Chemistry and Biochemistry, UCLA

## 11:45 How Quickly Can Sodium-ion Learn? Assessing Scenarios for Techno-Economic Competitiveness against Lithium-ion

Adrian Yao, Founder & Team Lead, STEER, Stanford University

Sodium-ion batteries have garnered significant attention as a potentially low-cost alternative to lithium-ion batteries. In this talk, we assess their techno-economic competitiveness against incumbent lithium-ion batteries. We compare projected price trends across over 6,000 scenarios while varying technology development roadmaps, supply chain scenarios, market penetration, and learning rates.

## 12:15 pm Enjoy Lunch on Your Own

## TECHNOLOGY TRANSFORMATION FROM BENCHTOP RESEARCH TO INDUSTRIAL DEVELOPMENT

### 1:10 Chairperson's Remarks

Celina Mikolajczak, Chief Battery Technology Officer, Lyten

## 1:15 Development of Drop-In Electrolytes for Next-Generation Electrode Materials

Feng Lin, PhD, Professor, Chemistry, Virginia Tech

Next-generation electrodes present challenges in practical applications, as many of these "new" materials are revisited versions of those abandoned decades ago due to stability issues. New advances in battery electrolytes have sparked renewed interest and understanding. It is an exciting time to apply this new knowledge to address key challenges in Mn-rich cathodes and high Si- or full-Si content anodes.

## 1:45 Satellite Batteries: LEO Megaconstellation Challenges & Opportunities

Ray Barsa, Principal Battery Engineer, SpaceX

Low Earth Orbit (LEO) megaconstellations are an emerging market for batteries. SpaceX's Starlink constellation comprises the majority of all active satellites, with thousands of Starlink Satellites launched in 2024 alone. This talk discusses the unique design, manufacturing, and operating requirements of Starlink batteries compared to typical terrestrial applications, from cell level chemistries to module-level design considerations.

## 2:15 Clean High-Throughput Continuous Manufacturing of Cathode Active Materials for Lithium Batteries

Jin Lim, PhD, CEO/CTO, ACT-ion Battery Technologies

ACT-ion's clean continuous manufacturing process offers an innovative and cost-effective method to produce cathode active materials (CAMs) for lithium batteries. This method effectively reduces energy consumption and production costs, while also lowering carbon emissions. In this presentation, we provide a comprehensive overview of the advancements in scaling up and commercializing the continuous manufacturing process with highlighting the significant strides made towards implementing this promising solution on a practical level.

## 2:45 New Chemistry Evaluation for High-Performance Cell Development at Saft

Jian Dong, PhD, Senior Engineer Cell Development, R&D Aerospace Defense & Performance ADP, SAFT America

Long term cycling results of new active materials, such as silicon based anode, LVPF (LiVPO4F) and LNMO (Li1.0Ni0.5Mn1.5O4) will be discussed in the talk. Specially designed cells are used to maximize the cycling performance of the materials themselves. In addition, the effect of temperature, loading, and particle size are explored to design a cell to reach 500 C-rate discharge capability.

## 3:15 Transition to Closing Plenary Panel

### CLOSING PLENARY PANEL DISCUSSION

#### 3:30 The Global Battery Industry Landscape: Opportunities & Illusions



Moderator: Christina Lampe-Onnerud, PhD, Founder and CEO, Cadenza Innovation

As the global battery industry experiences supercharged growth amidst shifting political dynamics, it faces both immense



# Lithium-ion Battery Development & Commercialization

opportunities and significant challenges. This international panel of experts, spanning critical sectors such as investment, supply chain, cell design, manufacturing and deployment, will share their insights on the industry's future. They will discuss growth prospects, key challenges, and achievable milestones in the near and long term.

*Panelists:*

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*Joern Tinnemeyer, Senior Vice President & Chief Technology Officer, EnerSys*

*Tracy Mckibben, Founder and CEO, MAC Global Partners*

*William Acker, PhD, Executive Director, New York Battery & Energy Storage Technology Consortium*

**4:30 Close of Conference**



# High-Performance Battery Manufacturing

Global Production of Safe, Efficient, Higher Energy Density Batteries

## MONDAY, MARCH 17

7:00 am Registration and Morning Coffee

4:45 pm Close of Day

## TUESDAY, MARCH 18

7:00 am Registration Open and Morning Coffee

### GLOBAL MARKET OPPORTUNITIES IN BATTERY MANUFACTURING

#### 8:05 Organizer's Remarks

Craig Wohlers, General Manager, Cambridge EnerTech

#### 8:10 Chairperson's Remarks

Joseph Fisher, President, JCF International

#### 8:15 Status of Chinese Semi-Solid-State Battery Market and Technology

Mark Lu, PhD, Senior Industrial Analyst, Industrial Economics & Knowledge Center, Industrial Technology Research Institute

The semi-solid-state battery has been achieved at the GWh-level already in China in 24H1, and also become the hottest issue to provide safer xEV usage and 1000 KM of driving range. This presentation will cover the Chinese semi-solid-state battery market, technologies, and manufacturing key issues to show the potentials and challenges.

#### 8:35 BATT Coalition Advocacy for a Robust Domestic Battery Materials Manufacturing Supply Chain

David Howell, Vice President, Strategic Marketing Innovations (SMI)

The U.S. has made significant progress to establish a domestic battery manufacturing supply chain, but gaps remain. The Battery Advocacy for Technology and Transformation (BATT) Coalition is a voice for the U.S. battery materials manufacturers working to grow the upstream materials supply from extraction, synthesis, processing, and recycling. BATT's mission is to advocate for legislative and federal policy that will promote market incentives and trade policies to support industry growth.

#### 8:55 Selected Deep Dive Topics from the Fields of Electrode Coating, Calendaring & Post-Drying

Prof. Dr.-Ing. Daniel Eggerath, Director Technical - Business Unit Energy, Jagenberg Converting Solutions GmbH

The manufacture of electrodes places the highest demands on the machinery and the associated process. In the field of electrode coating, the main focus is on slot die coating and the downstream drying process. During the subsequent calendaring process, the desired porosity is set by means of compaction. Any remaining solvent is removed in the final post-drying process. The so-called roll-to-roll process is gaining ground here as an alternative to vacuum drying. This presentation deals with selected detailed topics in the 3 areas mentioned above. In the area of coating, the slot-die process and the drying process will be highlighted. In the area of calendaring, attention will be paid to disruptive factors during calendaring and a newly developed residual moisture measurement principle will be presented for the post-drying process to detect the smallest residual solution quantities of 300ppm and less.



#### 9:15 KEYNOTE PRESENTATION: Today's EV Reality and the Path Forward

Tim DeBastos, Managing Director, LG Energy Solution

#### Tech Center, MI

LG Energy Solution is the leading lithium-ion battery manufacturer, working with the top OEMs globally in transforming the automobile industry. The market for EVs is expanding rapidly, driven by both consumer demand and regulatory incentives. In North America, there are unprecedented levels of investment to support EVs, by both OEMs and battery manufacturers. This presentation will discuss market growth projections, announced expansion plans, and the challenges ahead.

#### 9:45 Grand Opening Refreshment Break in the Exhibit Hall with Poster Viewing

### ADVANCES IN CELL MANUFACTURING

#### 10:30 KEYNOTE PRESENTATION: Exploring Cylindrical Battery Technology and Its Role in the Mobility Market

Fukuta Hirofumi, Manager, Panasonic

Panasonic Energy is the leading company in the field of cylindrical batteries, particularly for mobility applications. The company is at the forefront of innovative research into cylindrical lithium-ion batteries for the mobility market. In order to further improve driver usability, meet potential needs, and expand their market reach, Panasonic Energy is committed to the continuous evolution of their batteries in all aspects, including technology, service, and beyond.

#### 11:00 Advanced technology for built-in monitoring of large-size batteries for energy storage



Haohao Yi, Technical Director, Energy Storage Research Institute, EVE Energy US Holding LLC

Energy storage is increasingly being used on a large scale. But there have also been fire accidents, posing a risk to safety. A built-in module inside cell can detect abnormalities at an early stage and interventions are possible, this will greatly reduce the safety risk and improve the reliability of the battery.

We show a technical solution that relies on EVE's 628Ah battery cell, with a built-in module that can detect key signals such as temperature and pressure. Using artificial intelligence methods, battery abnormalities can be recognized in advance.

We show the technical work and results we have obtained so far, and discuss the direction of future work. We hope that this technology can be further developed and applied to real-world.



#### 11:30 Mechanism and Solutions for Li-ion Thermal Runaway via Internal Shorts: Laser vs DSC and ARC

John Zhang, PhD, CTO/CSO, Polypore International

The conclusions of this study, such as using ceramic coated separator (active approach), direct Cu/Al shorting (passive approach), etc. have been (extremely) broadly used in Li-ion industry today. The fire and explosion rate has been improved by 5 orders of magnitude. Now, all 3C and all NMC EDV and 70% LFP EDV are using the methods result from these improving methods.

#### 12:00 pm Paraclete Energy's SILO Silicon: 300% Energy Density, \$35/kWh Cost, Silane-Free Sustainability



Jeff Norris, CEO, Paraclete Energy Inc.

Explore Paraclete Energy's SILO Silicon technology, a breakthrough in silicon-anode materials for electric vehicles. With 300% the energy density of traditional graphite, SILO Silicon delivers a cost of just \$35/kWh, outperforming LFP by 34%. This innovative, silane-free solution enhances battery safety, sustainability, and scalability, paving the way



# High-Performance Battery Manufacturing

for faster charging, longer range, and significant cost savings. Learn how our silicon/polymer architecture eliminates silane gas, enabling safe, location-flexible production that supports the next generation of clean, affordable energy storage solutions for EVs and beyond.

## 12:30 Networking Luncheon

## 1:15 Dessert Break in the Exhibit Hall with Poster Viewing

## ADVANCES IN CELL MANUFACTURING

### 1:45 Chairperson's Remarks

Andreas Stummer, Director, BYK Gardner

### 1:50 Battery Manufacturing Excellence: Closing the Loop on Safety, Efficiency and Quality

JR Klein, Battery Technology Manufacturing Specialist, Honeywell

**Honeywell**

Battery manufacturers are faced with many challenges on their journey to mass production: from the day-to-day reality of operations, to detecting and preventing safety events, and ensuring a reliable supply of materials. Manufacturing inefficiencies can contribute to low yields which often correlate to safety-related defects and profit loss. All layers of the manufacturing operating system need to work seamlessly from the hardware on the plant floor to the corrective actions in the quality system to achieve battery manufacturing excellence. Join this session to learn how Honeywell is able to vertically integrate data into insight and build a closed loop adaptive system for safe, efficient and high-quality battery production.

### 2:20 Practices towards higher efficiency & cost-effectiveness in battery manufacturing

Yiming Hong, Dir Key Accounts, International BU, Ongoal Technology Co Ltd

**ONGOAL 宏工**

There are seven aspects we see as industrial trends of battery production - increasing equipment size and capacity, automation to minimize manpower, more simplified processes, standardization, smarter manufacturing, more energy saving production and digitalization. This session focuses on how ONGOAL's latest products and technologies enhance the efficiency and cost-effectiveness of battery production, featuring state-of-the-art equipment and systems in cathode and anode active materials production and cell manufacturing.

### 2:50 The Road to a 1000-Mile Battery - 24M's Fire and Recall Free Solutions and Design Platforms

Junzheng Chen, VP Advanced R&D, Advanced R&D, 24M Technologies Inc

**24m**

The far-reaching benefits of electrification are clear, but the promise of a battery-powered future is hindered by shortcomings and risk...fires, recalls, range, costs, recyclability, and more. Not content with incremental improvements nor wanting to wait another decade, 24M and its partners are pioneering innovations ready to implement and fundamentally improve the battery landscape today.

## 3:20 Refreshment Break in the Exhibit Hall with Poster Viewing

## PLENARY KEYNOTE

### 3:50 Chairperson's Remarks and Presentation of the 2025 Shep Wolsky Battery Innovator Award

Craig Wohlers, General Manager, Cambridge EnerTech



### 3:55 Can We Have a Safe Lithium-Metal Battery?

Shirley Meng, PhD, Director, Energy Storage Research Alliance (ESRA), Argonne National Laboratory; The Liew Family Professor, The University of Chicago

Along the pathway beyond 500 Wh/Kg, enabling lithium-metal anodes becomes a must. In this talk, I will introduce a new framework with which we can design lithium-metal anodes not only for high energy and long cycling, but also for safe operation. The design rule for possible anode-free architecture will also be discussed.



### 4:15 The Importance of Passive Propagation Resistance in Battery Pack Design

Troy Hayes, PhD, Director of Quality, Tesla

Over 30 years after the first Li-ion battery was produced, random thermal runaway events still occur. Despite the low probability of such incidents at the cell level, the volume of cells in EVs dictates that manufacturers prepare for these occurrences and ensure they do not create a significant risk for vehicle occupants. This talk will discuss the importance of passive propagation resistance and rigorous testing in safe battery pack design.



### 4:40 A Comprehensive Analysis of Modern Silicon-Carbon Nanocomposite Negative Electrode Materials for Li-ion Batteries

Jeff Dahn, FRSC, PhD, Professor of Physics and Atmospheric Science, NSERC/Tesla Canada Industrial Research Chair, Canada Research Chair, Dalhousie University

In this lecture I will describe the structure and properties of modern Si:C materials and show why they are so attractive compared to earlier alternatives. We will show results for Li-ion pouch cells containing 20% and 50% by weight of Si:C (balance graphite) where impressive cycle life has been achieved.



### 5:05 This and Next-Generation Battery Development—A UK Perspective

Martin Freer, PhD, CEO, Faraday Institution

The UK government set out a battery strategy in 2023, matched by a significant delivery program associated with the Faraday Battery Challenge, including the Faraday Institution which coordinates the UK's battery research program. This presentation will provide an overview of the UK's battery strategy, the development of associated research programs, and highlight future focus areas for research and innovation.

## 5:25 Reception in the Exhibit Hall with Poster Viewing

## 6:30 Close of Day

## WEDNESDAY, MARCH 19

## 6:45 am Registration Open

## 7:00 Coffee Talk: Interactive Roundtable Discussions with Coffee & Pastries

Roundtable discussions are informal, moderated discussions with brainstorming and interactive problem-solving, allowing participants from diverse backgrounds to exchange ideas and experiences and develop future collaborations around a focused topic.

## TABLE 1: Battery Raw Materials Supply Chain





# High-Performance Battery Manufacturing

*Moderator: Robert Privette, Manager, Business Development, Rechargeable Battery Materials North America, Umicore USA, Inc.*

## **TABLE 2: Li-ion NMC Fast Charging New Cells for E-Mobility**

*Moderator: Shmuel De-Leon, CEO, Shmuel De-Leon Energy Ltd.*

## **TABLE 3: Electrolyte Developments: New Components and Approaches**

*Moderator: Sam Jaffe, Vice President, Battery Solutions, E Source*

## **TABLE 4: Battery Pack System Cost and Safety – Will Future xEV Battery Packs Increase in Complexity or Simplify and How Will Cost and Safety Be Impacted?**

*Moderator: Kevin Konecky, Battery and Energy Storage Systems Consultant, Total Battery Consulting*

## **TABLE 5: Innovations in Recycling Battery Materials & Second Life**

*Moderator: Steven Sloop, President, OnTo Technology LLC*

## **TABLE 6: Opportunities and Barriers to Fast Charge in Automotive and Other Applications**

*Moderator: Brian Barnett, PhD, President, Battery Perspectives*

## **TABLE 7: Provisional Patents to Due Diligence**

*Moderator: Grant Ehrlich, PhD, Member, Intellectual Property & Technology, Stites & Harbison PLLC*

## **TABLE 8: Understanding the Pressure Effects on Li Metal Batteries**

*Moderator: Bin Li, Senior Scientist & Joint Professor, Electrification, Oak Ridge National Laboratory*

## **TABLE 9: Challenges and Opportunities in the Distribution of Relaxation Times Analysis**

*Moderator: Tom Ruether, Lecturer & Chair, Electrical Energy Systems, University of Bayreuth*

## **TABLE 10: How Will Emerging Technologies and Paradigms Impact the Future of Electrified Transportation?**

*Moderator: Benny Varghese, PhD, Research Engineer, Energy Storage & Advanced Transportation, Idaho National Laboratory*

## **TABLE 11: Battery Testing & Aging**

*Moderator: Gerald Sammer, PhD, Principal Business Development Manager, AVL List GmbH*

## **TABLE 12: Thermal Runaway**

*Moderator: Lin Liu, PhD, Professor, Mechanical Engineering, University of Kansas*

## **TABLE 13: Consumer-Driven Trends in Battery Development for Personal Electronics**

*Moderator: John Wozniak, PhD, President, ESP Consulting*

## **TABLE 14: Battery Electrolytes: Materials, Developments and Manufacturing**

*Moderator: Monica Usrey, R&D, Orbia Fluor & Energy Materials*

## **ADVANCES IN CELL MANUFACTURING**

### **7:55 Chairperson's Remarks**

*Robert Privette, Manager, Business Development, Umicore Battery Materials USA Inc*

### **8:00 Fiber-Based Separators—The Key to Efficient Manufacturing and Enhanced Battery Performance**

*Alexander Onz, Technical Program Manager IonPort, Sales, Delfort*

Often disregarded but crucial in every aspect, separators play an important role in battery development & production. Delfort's latest innovation, IonPort separators, bring significant benefits to both manufacturing efficiency and battery performance. Delfort has developed cutting-edge separators specifically designed for secondary batteries. With its exceptional thermal stability and ability for rapid electrolyte absorption, IonPort separators contribute effectively to enhanced and energy-saving cell production. Moreover, its unique innovative porous cellulose-fiber structure enhances ion flow, boosting charge/discharge rates and extending the battery's lifespan.



delfort

### **8:15 More than just gas—it's time to rethink your supply chain and services**

*John Burgess, Commercial Dir, Strategic Markets Mobility, Airgas, an Air Liquide company*

Gas supply is just one of many factors that companies must consider along the battery supply chain. While it may seem like just another box to check on your list, the right gas supply is as critical as any other utility employed. The US eV market is highly dynamic, requiring a supply chain that is built to be flexible with changing chemistries, form factors and production capacities. Without the right gas supply chain, your project will not be as efficient.

Join us to find out how Airgas' experience in gas applications can help you improve your project from start to finish for the following critical initiatives:

Construction supply chain Design and engineering support Ramp-up design Turnkey laboratory installation R & D collaboration Safety PPE for your team and the plant.



### **8:30 Online Monitoring of Battery Slurries—The Slurry Is Talking to Us**

*Kyung Hyun Ahn, PhD, Professor, Chemical & Biological Engineering, Seoul National University*

To efficiently produce high-quality electrodes, it is crucial to control the microstructure of the battery slurry, rather than focusing solely on composition. However, we do not understand the stress and the signs that the slurry experiences and expresses during the process. We have developed an all-in-one solution called SlurryXpert that precisely analyzes data signals through machine learning and detects the characteristics of the slurry to distinguish the structural differences.

### **8:50 Dispersion & Milling for Energy Storage Development & Manufacturing**

*Jonathan Bain, Business Line Manager, BYK Gardner*

Highly efficient dissolvers, bead mills and basket mills are designed for the challenges of battery slurry development. In this presentation we'll review the milling and dispersing requirements, process, and best practices. High-performance dispersing and milling equipment is required for optimum performance of battery slurries.

### **9:10 Squeezing the Juice out of Electrode Manufacturing - AM Batteries' Dry Process**

*Hieu Duong, PhD, Chief Manufacturing Officer, AM Batteries*

The global acceleration towards sustainable energy has driven the need for low-cost, de-carbonized battery manufacturing processes with differentiating product performances. Our liquid-free battery electrode manufacturing process entails 3 key steps: dry mixing, dry deposition, and mechanical compression. In this presentation, we will highlight our achievements and manufacturing advantages over other electrode process options.

### **9:30 Project Execution Strategy Approaches for Battery Plants**

*Mark Bellino, Global Director, Battery Metals & Cells, Battery Cell Manufacturing, Hatch*

Battery plants have been suffering from cost overruns and schedule delays due to numerous challenging issues that arise during the course of project execution. In this presentation, a review of different project-execution strategies are reviewed to compare the benefits and advantages of each option, including cost control, schedule certainty, flexibility, and adherence to quality criteria. Despite the option selected, appropriate planning and project management tends to improve the outcome, and therefore, recommendations are made for each execution model highlighted.





# High-Performance Battery Manufacturing

## 10:00 From Lab to Line: Reducing Costs & Enhancing Quality in Battery Manufacturing with Ultrasound & AI **liminal**

*Nicolina Nanni, Head of Product, Liminal*

Drawing from years of deep engagement with battery manufacturers globally, we will describe how real customers use ultrasound & AI to manufacture lower-cost, higher-quality cells at scale. Ultrasound detects subtle internal variations, uncovering defects & process inconsistencies that other methods miss. AI adds predictive power & classification of issues based on learned examples. We discuss how manufacturers can leverage ultrasound and AI during in-line production to optimize quality & cost.

## 10:15 Coffee Break in the Exhibit Hall with Poster Viewing

## 11:00 Advancing Battery Safety and Durability with High-Performance Atmospheric Spatial ALD

*Kyung Hyun Ahn, PhD, Professor, Chemical & Biological Engineering, Seoul National University*

We have developed a cutting-edge, high-speed atmospheric spatial ALD technology that significantly enhances lithium-ion and next-generation battery safety and performance. By applying Al<sub>2</sub>O<sub>3</sub> coatings to separators and anodes, this technology not only improves fire prevention and thermal stability but also inhibits dendrite growth on anodes, a key cause of battery failure. Our findings demonstrate how this innovation enhances battery durability and reliability, addressing critical industry challenges.

## COMPETING WITH ASIA

## 11:30 PANEL DISCUSSION: Why Is the Western World Still Lagging behind Asia in the Global Lithium Battery Race

*Moderator: Joseph Fisher, President, JCF International*

This panel will explore the reasons behind the western world's lag in the global lithium battery race compared to Asia. Our international group of experts will examine the challenges faced by western nations, including regulatory hurdles, market fragmentation, and the need for cohesive strategies to secure critical resources for emerging technologies and sustainable energy solutions.

*Panelists:*

*Chris A Turner, Chief Technology Officer, Inventus Power*

*Lie Shi, CEO, AM Batteries*

*David Howell, Vice President, Strategic Marketing Innovations (SMI)*

*James Greenberger, Founder & Executive Director, NAATBatt International*

*Carl Thoemmes, Business Development Director, Orbia Fluor & Energy Materials*

## 12:30 pm Battery Industry 3.0: How to Compete with China **VOLTAIQ**

*Tal Sholklafter, CEO & Co-Founder, Executive, Voltaiq, Inc.*

As the global battery market is dominated by a flood of inexpensive cells from China, the modern battery company must focus on speed and efficiency in order to stay competitive. This session will cover how OEMs can mitigate downstream risks from cheap, variable quality battery cells, how battery companies can compete with them, and how digital strategy is key to moving faster and doing more with less.

## 1:00 Networking Luncheon

## 2:15 Dessert Break in the Exhibit Hall with Poster Viewing

## 2:45 Close of Conference



# Global Supply Chain for Battery Raw Materials

Balancing Supply, Demand, and Costs for Battery Materials

## MONDAY, MARCH 17

7:00 am Registration and Morning Coffee

4:45 pm Close of Day

## TUESDAY, MARCH 18

7:00 am Registration Open and Morning Coffee

### GLOBAL PERSPECTIVES ON BATTERY RAW MATERIALS SUPPLY

#### 8:05 Organizer's Remarks

*Craig Wohlers, General Manager, Cambridge EnerTech*

#### 8:10 Chairperson's Remarks

*Andrew Saucer, Battery Raw Materials Analyst, Fastmarkets*

#### 8:15 The Evolution of Material Markets and Battery Production Costs

*Andrew Leyland, Co-Founder & Managing Director, SC Insights*

The presentation will examine how low battery prices can go, and if experience curves predicting further declines in price are becoming more or less relevant in the face of rising raw material cost share. This will draw upon SC Insights leading market and cost models, determining the price levels needed to incentivize long-term primary and secondary materials supply growth.

#### 8:45 Securing Supply Chains for the Energy Transition

*Kimberly Berman, Independent Consultant*

As automakers re-tool their EV strategies, the elephant in the room remains how to secure the necessary supply chains for the energy transition. While it is well known that China controls battery supply chains, there is also a lack of appetite for the necessary green premiums to de-risk supply. Nickel may be a prime example, but more abundant metals such as phosphorus and iron also have their hurdles to overcome.

#### 9:15 North America's Role in the Lithium-ion Economy

*Rory McNulty, Product Director (New Technology), Benchmark Mineral Intelligence*

This presentation will address lithium-ion battery supply-chain dynamics: challenges & opportunities as well as raw-material bottlenecks; lithium, cobalt, graphite, nickel, and financing the EV supply chain; and capital requirements to meet the EV demand of the coming decade.

#### 9:45 Grand Opening Refreshment Break in the Exhibit Hall with Poster Viewing

#### 10:30 FEATURED PRESENTATION: Developments in the Lithium Industry: Collaborations and Regulations with Global Impact

*Jorge Mora, Operations Manager, International Lithium Association*

The presentation by the International Lithium Association (ILiA) will explore challenges and potential solutions to some of the key global issues in the lithium industry, including efforts to coordinate carbon and water footprinting techniques and regionalization and friendshoring in the value chain. In addition, the role of the ISO in the lithium industry and the risks posed by misinformation will be discussed.



#### 11:00 FEATURED PRESENTATION: Pure Lithium—Introducing the Lithium-Metal Vanadium-Oxide Battery and Reinventing the Global Battery Supply Chain

*Emilie Bodoïn, Founder & CEO, Pure Lithium*

Pure Lithium's Brine to Battery extraction technology creates a lithium-metal battery-anode in one day. Our lithium-metal anode is paired with a non-flammable vanadium cathode to power an energy-dense, low-cost battery that can be completely sourced and manufactured in North America, ending all reliance on graphite, nickel, cobalt, and manganese. Led by Founders CEO Emilie Bodoïn and world-renowned battery expert, MIT Emeritus Professor Donald R. Sadoway, CSO.

#### 11:30 Lithium Ecosystem Evolution: Data-Driven Mine-to-Market Insights

*Irene Berry, Director, Lithium Data Science, Albemarle*

We will present our data-driven methodology for tracking these accelerating demand dynamics across existing—and emerging—battery technologies and the corresponding response from the lithium market. As the lithium ecosystem continues to evolve over the next decade, our agile analyses provide insight into lithium's present and future.

#### 12:00 pm New Production Methods to Enable Low-Cost, Sustainable, and High-Performance Cathode Active Materials

*Richard Holman, CTO, 6K Energy*

New approaches are needed in order to establish a sustainable, cost-effective cathode active material manufacturing ecosystem in the US. 6K's demonstrated plasma-based CAM synthesis enables the synthesis of high performance, advanced cathode materials with lower costs, near zero waste, and >40% lower emissions. Learn more about how 6K utilizes its novel plasma synthesis method to produce state of the art, domestic, single-crystal NMC materials while eliminating sodium sulfate waste streams



#### 12:30 Networking Luncheon

#### 1:15 Dessert Break in the Exhibit Hall with Poster Viewing

### GLOBAL PERSPECTIVES ON BATTERY RAW MATERIALS SUPPLY

#### 1:45 Chairperson's Remarks

*Andrew Leyland, Co-Founder & Managing Director, SC Insights*

#### 1:50 Battery-Metals Outlook—It's Always Darkest before Dawn

*Andrew Saucer, Battery Raw Materials Analyst, Fastmarkets*

The battery-metals prices have continued to trend lower over much of 2024, as oversupply and weaker than expected demand have added downward pressure. This patch of weakness is expected to be temporary, but it is having some long-term structural implications that will likely lead to more price volatility and geopolitical risk in the years ahead.

#### 2:20 The Importance of a Reliable and Sustainable Supply Chain for Battery Materials to Ensure Consistency in Quality and Pricing

*Kiriti Varma, Co Founder & COO, Altmin Pvt Ltd*

We are dedicated to creating a robust supply chain that meets the global energy needs of the future, by ensuring an uninterrupted supply chain to the existing and upcoming industries from our partnered mines in South America, assuring consistency in quality and pricing.



# Global Supply Chain for Battery Raw Materials

## 2:40 R&D GREET: A User-Friendly Tool to Evaluate Life-Cycle Impacts of Battery Supply Chains

Rakesh Krishnamoorthi Iyer, PhD, Energy Systems Analyst, Energy Systems & Infrastructure Analysis Division, Argonne National Lab

My talk will provide case studies from R&D GREET to highlight the effect of variations in supply chain parameters (e.g., ore grade, type, and location) on the environmental impacts of battery material production, and what these effects mean for the resultant batteries.

## 3:00 Battery Anodes, Worley's Insights and Global Outlook

Rio Glowasky, PMP, Study Lead: Battery Anode Materials, Worley

Worley Insight's market analysis of the battery anode delves into the intricacies of its unique value chain. In this talk, key findings from this yearlong study will be presented including a supply demand forecast by region and application, anode material trends by chemistry including how those will impact the demand for natural and synthetic graphite, concluded with typical investment costs and regional opportunities.

## 3:20 Refreshment Break in the Exhibit Hall with Poster Viewing

### PLENARY KEYNOTE

## 3:50 Chairperson's Remarks and Presentation of the 2025 Shep Wolsky Battery Innovator Award

Craig Wohlers, General Manager, Cambridge EnerTech



## 3:55 Can We Have a Safe Lithium-Metal Battery?

Shirley Meng, PhD, Director, Energy Storage Research Alliance (ESRA), Argonne National Laboratory; The Liew Family Professor, The University of Chicago

Along the pathway beyond 500 Wh/Kg, enabling lithium-metal anodes becomes a must. In this talk, I will introduce a new framework with which we can design lithium-metal anodes not only for high energy and long cycling, but also for safe operation. The design rule for possible anode-free architecture will also be discussed.



## 4:15 The Importance of Passive Propagation Resistance in Battery Pack Design

Troy Hayes, PhD, Director of Quality, Tesla

Over 30 years after the first Li-ion battery was produced, random thermal runaway events still occur. Despite the low probability of such incidents at the cell level, the volume of cells in EVs dictates that manufacturers prepare for these occurrences and ensure they do not create a significant risk for vehicle occupants. This talk will discuss the importance of passive propagation resistance and rigorous testing in safe battery pack design.



## 4:40 A Comprehensive Analysis of Modern Silicon-Carbon Nanocomposite Negative Electrode Materials for Li-ion Batteries

Jeff Dahn, FRSC, PhD, Professor of Physics and Atmospheric Science, NSERC/Tesla Canada Industrial Research Chair, Canada Research Chair, Dalhousie University

In this lecture I will describe the structure and properties of modern Si:C materials and show why they are so attractive compared to earlier alternatives. We will show results for Li-ion pouch cells containing 20% and 50% by weight of Si:C (balance graphite) where impressive cycle life has been achieved.



## 5:05 This and Next-Generation Battery Development—A UK Perspective

Martin Freer, PhD, CEO, Faraday Institution

The UK government set out a battery strategy in 2023, matched by a significant delivery program associated with the Faraday Battery Challenge, including the Faraday Institution which coordinates the UK's battery research program. This presentation will provide an overview of the UK's battery strategy, the development of associated research programs, and highlight future focus areas for research and innovation.

## 5:25 Reception in the Exhibit Hall with Poster Viewing

## 6:30 Close of Day

### WEDNESDAY, MARCH 19

## 6:45 am Registration Open

## 7:00 Coffee Talk: Interactive Roundtable Discussions with Coffee & Pastries

Roundtable discussions are informal, moderated discussions with brainstorming and interactive problem-solving, allowing participants from diverse backgrounds to exchange ideas and experiences and develop future collaborations around a focused topic.

### TABLE 1: Battery Raw Materials Supply Chain

Moderator: Robert Privette, Manager, Business Development, Rechargeable Battery Materials North America, Umicore USA, Inc.

### TABLE 2: Li-ion NMC Fast Charging New Cells for E-Mobility

Moderator: Shmuel De-Leon, CEO, Shmuel De-Leon Energy Ltd.

### TABLE 3: Electrolyte Developments: New Components and Approaches

Moderator: Sam Jaffe, Vice President, Battery Solutions, E Source

### TABLE 4: Battery Pack System Cost and Safety – Will Future xEV Battery Packs Increase in Complexity or Simplify and How Will Cost and Safety Be Impacted?

Moderator: Kevin Konecky, Battery and Energy Storage Systems Consultant, Total Battery Consulting

### TABLE 5: Innovations in Recycling Battery Materials & Second Life

Moderator: Steven Sloop, President, OnTo Technology LLC

### TABLE 6: Opportunities and Barriers to Fast Charge in Automotive and Other Applications

Moderator: Brian Barnett, PhD, President, Battery Perspectives

### TABLE 7: Provisional Patents to Due Diligence

Moderator: Grant Ehrlich, PhD, Member, Intellectual Property & Technology, Stites & Harbison PLLC

### TABLE 8: Understanding the Pressure Effects on Li Metal Batteries

Moderator: Bin Li, Senior Scientist & Joint Professor, Electrification, Oak Ridge National Laboratory

### TABLE 9: Challenges and Opportunities in the Distribution of Relaxation Times Analysis

Moderator: Tom Ruether, Lecturer & Chair, Electrical Energy Systems, University of Bayreuth

### TABLE 10: How Will Emerging Technologies and Paradigms Impact the Future of Electrified Transportation?

Moderator: Benny Varghese, PhD, Research Engineer, Energy Storage & Advanced Transportation, Idaho National Laboratory

### TABLE 11: Battery Testing & Aging

Moderator: Gerald Sammer, PhD, Principal Business Development Manager, AVL List GmbH

### TABLE 12: Thermal Runaway

Moderator: Lin Liu, PhD, Professor, Mechanical Engineering, University of Kansas

### TABLE 13: Consumer-Driven Trends in Battery Development for Personal Electronics





# Global Supply Chain for Battery Raw Materials

Moderator: John Wozniak, PhD, President, ESP Consulting

## TABLE 14: Battery Electrolytes: Materials, Developments and Manufacturing

Moderator: Monica Usrey, R&D, Orbia Fluor & Energy Materials

## MARKET DEMAND FOR BATTERY RAW MATERIALS

### 7:55 Chairperson's Remarks

Rakesh Krishnamoorth Iyer, PhD, Energy Systems Analyst, Energy Systems & Infrastructure Analysis Division, Argonne National Lab

### 8:00 Protect Your Cathode Materials with AEROXIDE Fumed Metal Oxides—Unlocking Unmatched Performance Benefits

Victor Lifton, Tech Director, Tech Market, Evonik Corp.

The presentation will focus on the recent developments in the area of fumed metal oxides to increase the performance, life-time and safety of the Li-ion battery. A dry coating of cathode active materials such as LCO, NCA and Ni-rich NMC types made possible only with AEROXIDE fumed metal oxides provides the benefits of surface protection of the cathode particles; less decomposition of cathode material and electrolyte; a significant increase in capacity retention and longer battery life. This unique approach based on the dry coating process created uniform nanoscale layers on the surface of Cathode Active Materials. Various materials compositions ranging from alumina to titania to complex Li-containing metal oxides will be discussed and compared on their effect on CAM properties.



### 8:30 Graphite and MWCNTs Made from CO<sub>2</sub>: Sustainable and Risk-Free Anode Materials

Sebastian Pohlmann, PhD, CTO, Up Catalyst OÜ

We present a novel sustainable and competitive source for graphite and MWCNTs. Using CO<sub>2</sub> as a carbon source, high-quality MWCNTs and graphite can be synthesized in low temperature—20x fewer carbon emissions for graphite combined with a localized production.

### 8:50 Reshaping the Supply Chain with Cost Effective, Domestically Sourced eCophite Material

Carol Hirschmugl, PhD, Founder & CEO, COnovate

COnovate will introduce patented eCophite™ active anode materials for lithium-ion batteries (LIBs) as a replacement for graphite. This material delivers benefits across the LIB ecosystem, providing improved cost and battery performance with domestically bio-sourced material eliminating dependencies on high-risk geographies for anode materials. As a carbon-based solution, the material is seamlessly compatible with anode incumbents' graphite and silicon-graphite and the existing battery manufacturing infrastructure.

### 9:10 Balancing the now and future: Global supply for current technology and innovating for emerging technology

Dana Swan, Business Development Manager - Battery, High Performance Polymers, Arkema Inc.



The global shift towards renewable energy and electric vehicles has significantly increased the demand for batteries, especially lithium-ion batteries, which are crucial for energy storage and transportation. To support this growing market, a reliable regional supply of raw materials is essential. This presentation will highlight how a specialty materials provider is contributing to current advancements in the industry. Additionally, it will explore emerging innovations in binder technologies that facilitate more sustainable manufacturing processes, such as waterborne and dry electrode processing.

### 9:30 Presentation to be Announced

### 10:00 Battery Material Performance Enhancer: ALD Nanocoatings for Li-Ion Cells

Joseph Troutman, Dir Gov Affairs, Legal, Forge Nano



The battery industry is in constant pursuit of new materials and processes that can increase cell performance to enable more reliable products. Forge Nano's proprietary Atomic Layer Deposition technology, Atomic Armor, optimizes battery materials by applying protective nanocoatings engineered to improve battery product performance and lifetime. The talk will cover Forge Nano's work on high-nickel NMC, graphite and silicon anodes, and give a glimpse into the newly formed Forge Battery, which intends to produce cylindrical cells using ALD-coated materials at gigawatt hour scale.

### 10:15 Coffee Break in the Exhibit Hall with Poster Viewing

### 11:00 Battery Raw Materials: Time to Market for New Mineral Deposits

Rod Eggert, PhD, Professor, Colorado School of Mines

This talk discusses the time lags in converting known but undeveloped mineral resources in the ground into operating mines and associated processing facilities. It uses detailed information on lithium as an example, but refers more broadly to other battery materials such as nickel and cobalt. It refers to both conventional resources, those for which there is commercial production at scale, and unconventional or secondary resources.

### 11:20 Optimization of Cathode Materials for High-Performance EV Batteries

Rohan Gokhale, PhD, Applied Technology Manager, Umicore Rechargeable Battery Materials

Umicore is a global leader in the battery cathode materials manufacturing space, with over 20 years of experience and expertise in development of specialized products using innovative processes, driven primarily by customer demand. This presentation will provide an overview of recent updates on localization of production in North America and toolkit used by CAM manufacturers to obtain best performance in the cathode product.

### 11:40 Delivering Localised Anode Active Material Production to the North Americas

Shaun Verner, Managing Director & CEO, Syrah Resources Ltd.

Syrah Resources has developed the world's premier Flake Graphite mine and processing facility in Mozambique, delivering significant volume underpinning the Lithium-ion battery materials market since 2018. Subsequently the company has delivered commercial production of Anode Active Materials in North America, further strengthening supply-chain resilience and providing local sourcing optionality for the first time.

### 12:00 pm Building a global supply chain for critical battery anode materials with CarbonX: a direct substitute for Chinese graphite

Steen McCollin, CCO, CarbonX bv



As the global energy transition accelerates, the demand for batteries is set to rise exponentially, with 5 TWh of battery capacity required by 2030. However, raw material supply chains are struggling to keep pace with 95% of the world's graphite coming from China, creating a supply chain vulnerable to geopolitics. CarbonX's innovative feedstock technology seamlessly integrates into existing carbon black production facilities, providing a direct substitute for Chinese graphite and offering the only drop-in solution that competes on cost, performance, sustainability, and supply reliability.



# Global Supply Chain for Battery Raw Materials

Set on a mission to create fully independent supply chain for critical battery anode materials in Europe and the US, CarbonX focuses on operational excellence in collaboration with cell manufacturers and EV OEMs, providing security of supply.

## 12:30 Meeting Global Demand for High-Performance, Low-Cost Carbon Nanotubes



*David Arthur, CEO, CHASM Advanced Materials*

*Dr. Hui Dong, R&D Manager of Energy Storage, Ingevity Corp*

With carbon nanotubes (CNTs) becoming critical for today's EV batteries, sustainable, scalable approaches to meet expected global demand are needed, including US and European production. In the past, commercial application has been hindered by the practical obstacles of scaling manufacturing at viable cost. In this talk, we'll discuss the key properties of carbon nanotubes that make them a superior carbon additive for Li-ion batteries and present CHASM's unique approach, which produces low-cost, tunable, and high-purity CNT materials.

## 1:00 Networking Luncheon

## 2:15 Dessert Break in the Exhibit Hall with Poster Viewing

## 2:45 Close of Conference



# Global Battery Manufacturing Production

Maximizing Production Efficiency & Quality to Deliver on Global Demand

## WEDNESDAY, MARCH 19

6:50 am Registration Open

1:00 pm Networking Luncheon

2:15 Dessert Break in the Exhibit Hall with Poster Viewing

### SCALING GLOBAL BATTERY PRODUCTION

2:40 Organizer's Remarks

*Craig Wohlers, General Manager, Cambridge EnerTech*

2:45 Chairperson's Remarks

*Bill Kephart, Associate Partner, P3 USA Inc*

#### 2:50 KEYNOTE PRESENTATION: 0 to 100,000,000: Lessons from Tesla's 4680 Journey

*Bonne Eggleston, PhD, Senior Director, Tesla*

Tesla's entry into the cell manufacturing space started in 2018 with an investigation searching for the platonic ideal battery design, and the manufacturing processes to match. Many salient lessons were learned along the way; we would like to highlight some of these lessons, which may help to guide others seeking to take new battery technologies from concept to reality.

#### 3:20 Key Success Factors for Efficiently Scaling-up Battery Manufacturing

*Hailong Ning, PhD, Co-Founder & CEO, VTA Technology*

The talk explores essential strategies for scaling battery manufacturing effectively, highlighting innovations in technology, supply chain optimization, workforce development, and sustainable practices.

#### 3:50 Reimagining Critical Environments for High Purity Manufacturing Cleanrooms

*David Rausch, Senior Business Development Manager, Sales & Marketing, Phoenix Controls Corp.*



This presentation will provide you with the basic approach on HVAC and pressure control design strategies with a focus on the ISO Class Cleanrooms. Specifically, we will emphasize variable air volume control and demand-based ventilation for EV Lithium Battery fabrication plants.

4:05 Sponsored Presentation (Opportunity Available)

4:20 Refreshment Break in the Exhibit Hall with Poster Viewing and Best of Show Winner to be Announced

5:00 Battery equipment CAPEX

*Dexter He, Engagement Manager, Battery Accelerator Team, McKinsey & Co.*

American market for gigafactory scale-up. In this talk, we will touch on key success factors for achieving competitiveness in the battery equipment industry, including competitive portfolio, performance, cost efficiency, execution excellence, and track records.

#### 5:30 Downstream Pack Manufacturing and Supply Chain Challenges and Opportunities

*John Warner, PhD, Chief Customer Officer, American Battery Solutions*

Battery pack manufacturing is a key step in the downstream value chain. It has evolved as the product designs have evolved and presents new and emerging challenges. This presentation will cover the challenges of battery pack manufacturing, ranging from volumes, product variation, and supply chain management, and then look at the future of pack

manufacturing from integrating new processes, AI, cybersecurity, and automation.

#### 6:00 Keeping Gigafactory Projects on Schedule

*Eric Boschert, Battery Manufacturing Expert, Jacobs Engineering*

The critical path on new gigafactory construction projects is often the design and delivery of long lead equipment— especially process manufacturing equipment. If you're a supplier, ever wondered how your design process impacts the overall construction schedule? EPC companies cannot usually share that information but today we'll discuss real examples that caused projects delays and how we can all help the battery industry complete projects on schedule.

6:30 Close of Day

## THURSDAY, MARCH 20

8:00 am Registration and Morning Coffee

### INNOVATION IN R&D FOR MANUFACTURING

8:25 Chairperson's Remarks

*Dexter He, Engagement Manager, Battery Accelerator Team, McKinsey & Co.*

#### 8:30 End-of-Line Battery Test Systems for Cell, Module, and Pack

*Don Wright, Vice President, Engineering, Unico*



As battery cell, module, and pack production ramps up, state of the art test systems can be utilized to perform critical end-of-line tests to assure that the batteries will last their entire lifetime. Real-world examples will be presented along with an open discussion on challenges facing the industry as production ramps up.

#### 9:00 Battery Manufacturing Quality Verification as a Key Enabler for an EV Future

*Erik Huemiller, PhD, Senior Researcher, R&D, General Motors*

Battery cost continues to be a limiting factor in transitioning to an EV driven world. Quality verification tools are key to lowering cost in the cell, module, and pack value chains. Process complexity and low reworkability amplify the impact of test methods on the bottom line. This talk will discuss recent manufacturing quality system research initiatives within General Motors targeted at improving battery manufacturing while enabling an EV future.

9:00 Battery Booth Crawl with Bagels in the Exhibit Hall with Last Chance for Poster Viewing

#### 9:30 Beyond the Surface: CT vs Ultrasound Inspection in Quality Battery Manufacturing

*Shawn Murphy, CEO & CTO & Co-Founder, Titan Advanced Energy Solutions*



As battery manufacturing evolves, so must our inspection methods. This presentation explores two leading inspection technologies: Computed Tomography (CT) and Ultrasound—and their roles in ensuring high-quality battery production. We will assess the benefits and challenges of each method in detecting internal defects, maintaining product integrity, and optimizing production time. Additionally, we will explore whether these technologies simply compete or can also complement each other to enhance manufacturing processes.

9:45 Presentation to be Announced





# Global Battery Manufacturing Production

## 10:15 Attendee Transition to Booth Crawl in Exhibit Hall

### 10:45 Challenges in Cell Manufacturing: Why Are Western Players Struggling So Much While Asian Competition Is Slowly Taking Over?

*Bill Kephart, Associate Partner, P3 USA Inc*

This presentation examines why emerging Western manufacturers are facing such challenges during their cell ramp-up and production, while Asian competitors, particularly from China, steadily advance. It further elaborates the relevance of switching to next-gen production technologies in this highly competitive industry and how it might impact production processes, ramp-ups and production excellence.

### 11:15 Revolutionary Innovations in Ultra-High-Power Cells by MoliceL

*Nan Hong Lester Yeh, R&D Mgr, Advanced Battery Technologies, MoliceL*

Nan-Hung, Yeh (Ph.D.) is a manager of R&D and chief cell designer at E-one Moli Energy. His work focuses specifically on the high-performance LIBs design, performance shaping and manufacturing process development, which includes high energy density cathode material research, electrode design/engineering, interface design/ engineering, heat/ thermal study, and synchrotron radiation in-situ electrochemical analysis. His recent R&D works and projects are main interests: ultra-fast charge interface, extreme high-power battery accomplishment and advanced LIBs material application. He will present MoliceL's revolutionary innovations in Ultra-High-Power Cells, demonstrating how MoliceL's unique interfacing technology is leading the breakthrough of performance and safety to next level. And how our new generation LIB cells empower the applications in AI data center BBUs, premium EVs, racing sports cars, eVTOLs, two-wheeled motorcycle, and heavy-lift drones.



### 11:45 Battery Manufacturing for Special Applications: Scaling from R&D to Gigafactories through Real-world Production Experience

*Stefan Alexander Permien, CEO, UniverCell Holding GmbH*

Started in 2019 as a specialized electrode and cell manufacturer, UniverCell has developed its technical expertise and production know-how over the past five years by supporting customers across the battery value chain, from recipe development to full GWh-scale electrode production. The lessons learned during this period have enabled us to better understand the true Technology Readiness Level (TRL) of emerging technologies in this industry. Over the last two years, these insights have allowed us to develop our own flexible, state-of-the-art cylindrical cell products and production lines tailored for North American and EU customers with specialized applications.



### 12:00 pm Non-Destructive Quantitative Phase Characterization of Black Mass in the X-ray Microscope: Enabling remanufacturing of batteries

*Andy Holwell, Head Business Sector Industrial Research, Research Microscopy Solutions, ZEISS Microscopy*

As scrap automotive batteries start to mount in the next decade in North America and Europe, battery manufacturing challenges and opportunities become also battery demanufacturing and remanufacturing opportunities. By applying novel machine learning phase contrast and identification techniques to black mass analysis, combining non-destructive X-ray microscopy and automated mineralogy, we are able to identify and quantify all the components in black mass, chemically and morphologically. In so doing, we can validate and inform the processing chemistry of the remanufacturing process for enhanced recovery and sustainability.



## 12:15 Enjoy Lunch on Your Own

## INNOVATION IN R&D FOR MANUFACTURING

### 1:10 Chairperson's Remarks

*Eric Boschert, Battery Manufacturing Expert, Jacobs Engineering*

### 1:15 Surface Treatment Solutions for Mixing and Rolling Equipment to Reduce Electrode Contamination and Extend Component Life

*Adam Smith, PhD, Research Scientist, High Velocity Thin Films, R&D, Linde AMT*

New battery factories are ramping to full-time production. The industry is gaining experience on the life of the original equipment components used in the mixing and rolling processes. Linde Advanced Material Technologies has a portfolio of surface treatments to protect these components against wear and corrosion to retain product quality and extend component life.

## BRIDGING THE TALENT GAP

### 1:45 Battery Talent Trends, Solutions, and Development

*Matt Anders, Vice President, Batteries & Future Mobility, Pangea Talent Solutions*

As the battery industry continues to expand, who you hire into your organization is a critical component of your success. In what seems like an increasingly competitive industry—and talent still in short supply—how can you stand out? We will provide insight to help promote a positive company reputation, efficient talent acquisition practices, and other solutions to help secure the talent you are looking for.

## SCALING GLOBAL BATTERY PRODUCTION

### 2:15 Successfully Identifying the Optimal Production Location with Maximized Incentives for Your Full-Scale Gigafactory

*Tom Croteau, Senior Managing Director, Maxis Advisors*

The talk explores critical site selection factors for companies transitioning to full-scale manufacturing. Whether navigating federal "Disadvantaged Communities," "Justice 40 initiatives," or "Energy Communities" requirements—or more traditional comparative analyses of carbon neutral energy sources and costs, talent availability, and logistics—or utilizing economic incentive, a technical Site Selection approach can enhance your ability to thread the needle to unlock an optimal full-scale factory location while securing maximum financial assistance.

### 2:45 Washington Takes Aim at EV Battery Offshore Inputs

*Antonio Rivera, Partner and Electric Mobility Practice Group Leader, ArentFox Schiff LLP*

Washington's policy and funding support for U.S. domestic EV manufacturing comes with caveats primarily in the form of steep import tariffs, from the 2022 IRA to 100% import duties on EV's produced in China. Understanding the underlying "country of origin" rule and how the legal term "substantial transformation" can be applied are key to mitigating costly tariffs and reduce procurement uncertainty.

### 3:15 Transition to Closing Plenary Panel





## CLOSING PLENARY PANEL DISCUSSION

### 3:30 The Global Battery Industry Landscape: Opportunities & Illusions



*Moderator: Christina Lampe-Onnerud, PhD, Founder and CEO, Cadenza Innovation*

As the global battery industry experiences supercharged growth amidst shifting political dynamics, it faces both immense opportunities and significant challenges. This international panel of experts, spanning critical sectors such as investment, supply chain, cell design, manufacturing and deployment, will share their insights on the industry's future. They will discuss growth prospects, key challenges, and achievable milestones in the near and long term.

*Panelists:*

*Oliver Gross, MSc, SME Energy Storage and Conversion, Advanced Propulsion Technology, Stellantis*

*Joern Tinnemeyer, Senior Vice President & Chief Technology Officer, EnerSys*

*Tracy Mckibben, Founder and CEO, MAC Global Partners*

*William Acker, PhD, Executive Director, New York Battery & Energy Storage Technology Consortium*

### 4:30 Close of Conference



# Advances in Automotive Battery Applications

Optimizing High-Performance Batteries for EVs

## MONDAY, MARCH 17

**7:00 am Registration and Morning Coffee**

**4:45 pm Close of Day**

## TUESDAY, MARCH 18

**7:00 am Registration Open and Morning Coffee**

### OEM APPLICATION-DRIVEN DEVELOPMENT

#### 8:05 Organizer's Remarks

*Craig Wohlers, General Manager, Cambridge EnerTech*

#### 8:10 Chairperson's Remarks

*Tobias Glossmann, Principal Systems Engineer, HV Battery Research and Test Lab, Mercedes-Benz Research and Development North America*

#### 8:15 Bridging Lab and Real-World Battery Cell Testing Challenges

*Saewon Kim, Senior Battery Cell Engineer, Lucid Motors*

This session introduces an innovative approach for testing battery cell lifetimes in automotive applications by devising scenarios that reflect diverse customer behaviors through fleet data analysis. This method captures realistic battery degradation trends under actual driving conditions and bridging the gap between lab-scale cell testing and vehicle-level aging tests. It also addresses the warranty concerns while complementing traditional lab testing environments.

#### 8:45 Measurement Derived Pack-to-Pack Aging State Variance of Lithium-ion Batteries in Electric Buses

*Dr. Natalia Cañas, Team Lead Battery, Energy Management and Testing, Daimler Buses*

*Susann Wunsch, Software Development Engineer, Daimler Buses GmbH*

This talk presents the State of Health Inconsistency (SOHI), a new parameter designed to monitor the aging-state variance in connected batteries. This comprehensive approach provides insights into the aging processes, allowing for improved management and optimization of battery systems.

#### 9:15 Dry Battery Electrode Manufacturing for Graphite Anodes

*Frederik Morgenstern, Senior Battery Technology Engineer, BMW Group*

The Dalhousie group demonstrated that expansion of active materials causes electrolyte flow in cylindrical cells upon cell cycling. We discuss the influence of this electrolyte inhomogeneity on cell performance and lifetime. This novel mechanism—which we termed “electrolyte motion-induced salt inhomogeneity” (EMSI)—is not restricted to cylindrical cells but can occur in all large-format lithium-ion cells under high compression.

#### 9:45 Grand Opening Refreshment Break in the Exhibit Hall with Poster Viewing

#### 10:30 Lightweighting in Automotive Batteries—Conflicts and Contradictions

*Oliver Gross, MAsC, SME Energy Storage and Conversion, Advanced Propulsion Technology, Stellantis*

A lower weight EV battery will improve overall vehicle efficiency and energy use when the vehicle is in operation. There are many paths to reducing battery weight, through new materials and technologies, but

also through prudent synergistic design and use cases. These routes can introduce other significant drawbacks as well. This talk will compare and contrast different drivers and their respective figures of merit on battery lightweighting.

#### 11:00 Overview of Battery Development Programs at USABC

*Meng Jiang, PhD, Staff Researcher, R&D, General Motors Company*

The United States Advanced Battery Consortium is a collaborative research partnership among Ford, General Motors, and Stellantis. USABC has been pursuing advanced energy storage technologies for electrified vehicles for over 30 years. This talk will highlight the recent history of USABC, as well as provide an overview of expected upcoming funding opportunities for US-based battery suppliers.

#### 11:30 Solid-State Battery Commercialization: Status and Challenges

*Alvaro Masias, Supervisor, Cell Technology Research, Ford Motor Company*

Solid state batteries garner a large amount of attention as the future of next-generation battery chemistries and as a result it can be difficult to separate hype from reality in this important technology. This talk will discuss the status of solid state battery commercialization, important challenges remaining, and technology needs from an automotive OEM perspective.

#### 12:00 pm Engineering High-Performance Battery Solutions for Electric Mobility

*Ionel Stefan, CTO, Executive Team, Amprius Technologies*

Amprius offers commercialized silicon anode cells that achieve 50-80% greater energy density and specific energy performance compared to conventional graphite-based lithium-ion batteries. These advanced batteries deliver up to 1,300 Wh/L and 500 Wh/kg while maintaining high rates of charge and discharge without overheating. Their robust cycle life supports demanding aerospace, military, and other high-end use cases, redefining what's possible for next-generation energy storage solutions.



#### 12:30 Networking Luncheon

#### 1:15 Dessert Break in the Exhibit Hall with Poster Viewing

### OEM APPLICATION-DRIVEN DEVELOPMENT

#### 1:45 Chairperson's Remarks

*Alvaro Masias, Supervisor, Cell Technology Research, Ford Motor Company*

#### 1:50 Cathode Degradation Revisited—Automotive Perspective

*Tobias Glossmann, Principal Systems Engineer, HV Battery Research and Test Lab, Mercedes-Benz Research and Development North America*

Battery degradation is to a large part attributed to the anode. As the industry strives for higher performance batteries, the cathode is moving more into focus. If the battery can be utilized better, cost is effectively reduced and energy density increased. We have studied several aspects of cathode degradation and want to review it from an automotive perspective.

#### 2:20 Dry-Deposited, Thick, Highly Conductive Composite Electrodes for EV Battery Applications

*Oleg Kuznetsov, PhD, Senior Scientist, Material Science, Honda Research Institute*

EV batteries should be able to operate at higher C-rates (1-10C typical) for short periods of time, when more power is needed. Our novel dry-deposited composite electrodes, consisting of active material particles



# Advances in Automotive Battery Applications

embedded into 3-dimensional network of pristine few-bundled SWCNTs, can be produced in a wide range of electrode parameters ( $\leq 3\text{mm}$  thick,  $\leq 350\text{mg}$  active material/ $\text{cm}^2$ ,  $\leq 103\text{S/m}$ ). Optimization of these parameters allows balancing high energy density with power performance of EV batteries.

## 2:40 Daimler Truck Cell Technology

Rianne Schoeffler, Electrochemist & Battery Product Developer, Daimler Truck North America

Battery Electric Trucks are an important part of Daimler Trucks strategy to reduce GHG emissions. This presentation will investigate the unique challenges for the electrification of heavy duty vehicles with a special focus on the need for a truckified cell.

## ADVANCED BATTERY R&D FOR AUTOMOTIVE APPLICATIONS

### 3:00 Earth-Abundant Cathode-Active Materials: Research and Development Efforts at Argonne National Laboratory

Jason Croy, PhD, Group Leader, Materials Research Group, Electrochemical Energy Storage, Argonne National Lab

The Vehicle Technologies Office (US DoE) has established a consortium of six national laboratories to address the challenges of enabling sustainable cathode technologies. This consortium is focusing efforts across a wide range of materials and technology readiness levels. In this presentation, we will discuss ongoing efforts within the program aimed at the design, synthesis, and characterization of Mn-rich cathodes as alternative, next-generation materials.

### 3:20 Refreshment Break in the Exhibit Hall with Poster Viewing

## PLENARY KEYNOTE

### 3:50 Chairperson's Remarks and Presentation of the 2025 Shep Wolsky Battery Innovator Award

Craig Wohlers, General Manager, Cambridge EnerTech



#### 3:55 Can We Have a Safe Lithium-Metal Battery?

Shirley Meng, PhD, Director, Energy Storage Research Alliance (ESRA), Argonne National Laboratory; The Liew Family Professor, The University of Chicago

Along the pathway beyond 500 Wh/Kg, enabling lithium-metal anodes becomes a must. In this talk, I will introduce a new framework with which we can design lithium-metal anodes not only for high energy and long cycling, but also for safe operation. The design rule for possible anode-free architecture will also be discussed.



#### 4:15 The Importance of Passive Propagation Resistance in Battery Pack Design

Troy Hayes, PhD, Director of Quality, Tesla

Over 30 years after the first Li-ion battery was produced, random thermal runaway events still occur. Despite the low probability of such incidents at the cell level, the volume of cells in EVs dictates that manufacturers prepare for these occurrences and ensure they do not create a significant risk for vehicle occupants. This talk will discuss the importance of passive propagation resistance and rigorous testing in safe battery pack design.



#### 4:40 A Comprehensive Analysis of Modern Silicon-Carbon Nanocomposite Negative Electrode Materials for Li-ion Batteries

Jeff Dahn, FRSC, PhD, Professor of Physics and Atmospheric Science, NSERC/Tesla Canada Industrial

Research Chair, Canada Research Chair, Dalhousie University  
In this lecture I will describe the structure and properties of modern Si:C materials and show why they are so attractive compared to earlier alternatives. We will show results for Li-ion pouch cells containing 20% and 50% by weight of Si:C (balance graphite) where impressive cycle life has been achieved.



#### 5:05 This and Next-Generation Battery Development—A UK Perspective

Martin Freer, PhD, CEO, Faraday Institution

The UK government set out a battery strategy in 2023, matched by a significant delivery program associated with the Faraday Battery Challenge, including the Faraday Institution which coordinates the UK's battery research program. This presentation will provide an overview of the UK's battery strategy, the development of associated research programs, and highlight future focus areas for research and innovation.

### 5:25 Reception in the Exhibit Hall with Poster Viewing

### 6:30 Close of Day

## WEDNESDAY, MARCH 19

### 6:45 am Registration Open

### 7:00 Coffee Talk: Interactive Roundtable Discussions with Coffee & Pastries

Roundtable discussions are informal, moderated discussions with brainstorming and interactive problem-solving, allowing participants from diverse backgrounds to exchange ideas and experiences and develop future collaborations around a focused topic.

#### TABLE 1: Battery Raw Materials Supply Chain

Moderator: Robert Privette, Manager, Business Development, Rechargeable Battery Materials North America, Umicore USA, Inc.

#### TABLE 2: Li-ion NMC Fast Charging New Cells for E-Mobility

Moderator: Shmuel De-Leon, CEO, Shmuel De-Leon Energy Ltd.

#### TABLE 3: Electrolyte Developments: New Components and Approaches

Moderator: Sam Jaffe, Vice President, Battery Solutions, E Source

#### TABLE 4: Battery Pack System Cost and Safety – Will Future xEV Battery Packs Increase in Complexity or Simplify and How Will Cost and Safety Be Impacted?

Moderator: Kevin Konecky, Battery and Energy Storage Systems Consultant, Total Battery Consulting

#### TABLE 5: Innovations in Recycling Battery Materials & Second Life

Moderator: Steven Sloop, President, OnTo Technology LLC

#### TABLE 6: Opportunities and Barriers to Fast Charge in Automotive and Other Applications

Moderator: Brian Barnett, PhD, President, Battery Perspectives

#### TABLE 7: Provisional Patents to Due Diligence

Moderator: Grant Ehrlich, PhD, Member, Intellectual Property & Technology, Stites & Harbison PLLC

#### TABLE 8: Understanding the Pressure Effects on Li Metal Batteries

Moderator: Bin Li, Senior Scientist & Joint Professor, Electrification, Oak Ridge National Laboratory

#### TABLE 9: Challenges and Opportunities in the Distribution of Relaxation



# Advances in Automotive Battery Applications

## Times Analysis

*Moderator: Tom Ruether, Lecturer & Chair, Electrical Energy Systems, University of Bayreuth*

### **TABLE 10: How Will Emerging Technologies and Paradigms Impact the Future of Electrified Transportation?**

*Moderator: Benny Varghese, PhD, Research Engineer, Energy Storage & Advanced Transportation, Idaho National Laboratory*

### **TABLE 11: Battery Testing & Aging**

*Moderator: Gerald Sammer, PhD, Principal Business Development Manager, AVL List GmbH*

### **TABLE 12: Thermal Runaway**

*Moderator: Lin Liu, PhD, Professor, Mechanical Engineering, University of Kansas*

### **TABLE 13: Consumer-Driven Trends in Battery Development for Personal Electronics**

*Moderator: John Wozniak, PhD, President, ESP Consulting*

### **TABLE 14: Battery Electrolytes: Materials, Developments and Manufacturing**

*Moderator: Monica Usrey, R&D, Orbia Fluor & Energy Materials*

## **ADVANCED BATTERY R&D FOR AUTOMOTIVE APPLICATIONS**

### **7:55 Chairperson's Remarks**

*Jason Croy, PhD, Group Leader, Materials Research Group, Electrochemical Energy Storage, Argonne National Lab*

### **8:00 Material & Application Solutions to Enable Cell-to-Pack Battery Design**

*Dalton Conlon, Bus Dev Mgr, EMO, Henkel Corp*

Traditional module-based BEV vehicle designs require components such as module casings. In new designs, such as cell-to-pack, the need for these components is eliminated, leading to a lighter and more compact battery pack. Without components such as module casings, however, the battery is susceptible to more demanding environmental and mechanical performance conditions. We'll explore the integration and usefulness of technologies such as thermally conductive adhesives, dielectric coatings and structural adhesives within the context of this emerging battery design.

### **8:30 Optimizing Performance of LMFP/NMC Blends**

*Dee Strand, PhD, CSO, R&D, Wildcat Discovery Technologies, Inc.*

This presentation shows a systematic evaluation of NMC and LMP blends with the aim of mapping the blend/performance space. The focus will be on performance metrics for high-energy cells with power performance sufficient for auto applications.

### **8:50 Updates in Lithium-Metal Battery Development for Electric Vehicle Applications**

*Alex Louli, PhD, Senior Applications Engineer, QuantumScape*

Today's lithium-ion batteries fall short of meeting consumer needs in key areas like driving range, charging speed, and safety. Solid-state lithium-metal batteries have the potential to bridge this gap by enabling longer range, faster charging, and enhanced safety. QuantumScape's VP of Engineering, Will Hudson, will highlight recent developments in solid-state battery technology for automotive applications and discuss innovative commercialization strategies expected to get this technology on the road.

### **9:10 Wireless Battery Management Systems: Innovations, Challenges, and Future Perspectives**

*Chris Mi, PhD, Fellow, IEEE & SAE, Distinguished Professor, San Diego State University*

With the growing adoption of batteries, the effective management of

battery systems has become increasingly critical. The advent of Wireless Battery Management Systems (wBMS) represents a significant innovation in battery management to overcome the challenges of traditional wired BMS, including complexity, weight, and failure modes. wBMS eliminates physical connections, offers enhanced flexibility, reduces packaging complexity, and improves reliability. This talk explores its evolution, current state, and future directions.

### **9:30 Improving Battery Reliability with X-ray Particle Contaminants Analysis**

*Dean Schmidt, US Key Account & Channel Partner Manager, Sales, Hitachi High Tech*



The use of X-ray particle contaminants analysis technology can help battery manufacturers improve product safety, performance, and yield by rapidly detecting and analyzing unwanted metal particles. By improving overall yield and reducing waste, you can deliver a range of operational and strategic benefits for your organization, with solutions that are available now and developing in line with future trends.

### **9:45 Rethinking the Battery Test Lab Environment to Meet Future Testing Demands**



*Bob Zollo, Strategic Portfolio Planner, Automotive & Energy Solutions, Keysight Technologies*

New EV battery pack designs with higher capacities require a new way of thinking about the test laboratory environment to achieve efficiency while maintaining flexibility. Testing general driving profiles usually requires low power at the test stand, while maximum power peaks are rare. This duty cycle can be exploited for savings. We will present an innovative, demand-driven power allocation approach with up to 20% savings in both the footprint and price, while guaranteeing sufficient power.

### **10:15 Coffee Break in the Exhibit Hall with Poster Viewing**

### **11:00 Outstanding Battery Performance and Safety in Automotive Applications by AI-Powered Digital Twins**

*Nikolaus Keuth, PhD, Head of Product and Solution Management, IODP XI Data Analytics Solutions, AVL List GmbH*

The presentation delves into the innovative application of AI-powered digital twins for battery systems. This cutting-edge approach aims to enhance battery safety, reduce warranty claims, and optimize performance through precise failure prediction and health monitoring. By leveraging data from development, telematics, and in-vehicle usage, this scalable digital-twin architecture promises to revolutionize the automotive industry, offering significant cost savings and improved battery life.

### **11:30 Immersion Cooling: Why, How and What For? A Demonstration Using TotalEnergies Fluid Solutions**

*Gerard Quoirin, Battery specialist, TotalEnergies Lubrifiants S.A.*



Immersion cooling of lithium batteries is now seen as a major advance in meeting the challenges of new-generation batteries: fast charging, high energy density, improved safety and enhanced durability. While the benefits of the immersion cooling method are no longer disputed, its implementation remains complex and requires new development methods. Using a number of concrete examples, from the PHEV to the EV, right through to the Battery Swapping concept, we will see how TotalEnergies fluids can respond to the different applications of immersed batteries.





# Advances in Automotive Battery Applications

## OUTLOOK FOR EV MARKET EXPANSION

### **12:00 pm EV Sales Review for 2024, Expectations Going Forward, and Implications for Battery Demand**

*Viktor Irle, Co-Founder & Market Analyst, EV Volumes*

This presentation will cover the EV Sales Review of 2024, expectations going forward, and implications on battery demand, and will share the latest insights from collecting the facts in the EV industry. You will understand the best sellers, which countries and regions are doing the most for EV adoption, and what to expect in the future, both short term, and long term.

### **12:20 Industry Updates: Emerging Battery Technology and the Potential Changes to the Automotive Market**

*Michael Sanders, Senior Advisor, Energy, Avicenne Energy*

There have been many announcements for capacity, new technology, and impact to the markets—many of these are overstated. Avicenne Energy will be sharing a realistic view and presenting updates on the mass commercialization of lithium-ion battery. Many emerging technologies could have impact for the automotive markets. Technologies to be covered are lithium-ion, dry process, solid state and sodium ion with key drivers, progress to date and forecasts.

### **12:40 Battery Technology Roadmaps: Unravelling the Current Landscape and Confronting Challenges for Solid-State Batteries**

*Varnika Agarwal, Research Analyst, Rho Motion*

The battery market saw a deployment of around 1.2TWh in 2024. Battery evolution is occurring in many different directions, with each avenue viewed as 'the next big thing.' Developments include advancements in LFP chemistry with LMFP, the use of silicon anodes, sodium-ion, or the emergence of ultra-fast charging technologies. However, solid-state batteries have gained interest for over a decade now.

### **1:00 Networking Luncheon**

### **2:15 Dessert Break in the Exhibit Hall with Poster Viewing**

### **2:45 Close of Conference**

**WEDNESDAY, MARCH 19****6:50 am Registration Open****1:00 pm Networking Luncheon****2:15 Dessert Break in the Exhibit Hall with Poster Viewing****ALTERNATIVE CHEMISTRIES FOR STATIONARY ENERGY STORAGE****2:40 Organizer's Remarks***Mary Ann Brown, Executive Director, Conferences, Cambridge EnerTech***2:45 Chairperson's Remarks***Ilias Belharouak, PhD, Section Head, Electrification and Energy Infrastructure Division, Oak Ridge National Laboratory***2:50 Carbon-Capture Batteries For Grid Energy Storage***Ilias Belharouak, PhD, Section Head, Electrification and Energy Infrastructure Division, Oak Ridge National Laboratory*

Efficient use of renewable energy sources and reduction of carbon dioxide emissions depend on the advancement of long-duration energy storage technology. This study explores how the aqueous Na-CO<sub>2</sub> battery deactivates and reactivates during extended cycling. Comprehensive characterization reveals valuable insights into the decomposition products. We demonstrate a technique involving electrochemical processes to renew these water-based cells. Gained insights pave the way for the development of self-healing systems with extended lifespans.

**3:20 Advancing BESS with Sodium-ion Batteries***Brandon Kelly, PhD, Vice President, Cell Engineering, Peak Energy*

Sodium-ion batteries are set to transform utility-scale energy storage systems BESS. Utilizing NFPP (Na<sub>4</sub>Fe<sub>3</sub>(PO<sub>4</sub>)<sub>2</sub>P<sub>2</sub>O<sub>7</sub>) cathode and hard carbon anode provides outstanding cycling stability and critical safety advantages, enabling the safe placement of BESS closer to city centers and high-demand areas, reducing transmission costs and improving grid efficiency. At the system level, the energy density of NFPP/HC sodium-ion batteries is highly competitive, ensuring optimal footprint and cost-efficiency while delivering robust performance.

**3:50 Presentation to be Announced****4:20 Refreshment Break in the Exhibit Hall with Poster Viewing and Best of Show Winner to be Announced****5:00 Advanced Non-Flow Zinc Alloy-Bromide Battery for Stationary Storage***Prima Francis, PhD, Senior Scientist, R&D, Golden Gate Battery India Pvt. Ltd.*

Our advanced non-Flow Zinc Bromide battery offers an alternative to LFP batteries, with comparable energy density and cycle life, but with a 25% cost reduction. We will discuss the R&D pathways to resolve the technical issues traditionally associated with such batteries, namely, dendrite formation, free bromine corrosion and electrode damage. With abundant raw materials and almost 100% recyclability, our Zinc Bromide batteries offer a sustainable and cost-effective energy storage solution.

**REPT****5:30 Sodium-Sulfur Batteries (NAS Batteries) for Long-Duration Stationary Energy Storage***Caroline Brannock, PhD, Senior Sales Manager, Battery Technology, BASF Corp.*

Sodium-sulfur (NAS) batteries have a 20-year history of providing reliable power. Due to their containerized nature, NAS can be easily scaled to any size for utility-scale requirements, and they can operate in extreme weather conditions without additional efforts for cooling or heating. Through this presentation, I will explain how NAS batteries are a good fit for operators looking to prepare their grids for the challenges in the years to come.

**6:00 PANEL DISCUSSION: Exploring Traditional and Emerging Electrochemistries for Utility-Scale Energy Storage Systems***Moderator: Ilias Belharouak, PhD, Section Head, Electrification and Energy Infrastructure Division, Oak Ridge National Laboratory*

The future of renewable energy and the reduction of carbon emissions rely heavily on the continued development of advanced energy storage technologies. This panel of experts dives into both traditional and emerging electrochemistries for utility-scale systems, addressing key factors that shape the industry, including:

- Long-duration energy storage solutions
- Energy density improvements
- Cycling stability and performance
- Safety enhancements
- Cost-efficiency and scalability
- Availability and sourcing of raw materials
- Recyclability and sustainability

*Panelists:**Caroline Brannock, PhD, Senior Sales Manager, Battery Technology, BASF Corp.**Prima Francis, PhD, Senior Scientist, R&D, Golden Gate Battery India Pvt. Ltd.**Brandon Kelly, PhD, Vice President, Cell Engineering, Peak Energy***6:30 Close of Day****THURSDAY, MARCH 20****8:00 am Registration and Morning Coffee****DEVELOPING AND IMPLEMENTING BESS****8:40 Chairperson's Remarks***Chris Wright, Senior Vice President, Project Technology, Spearmint Energy***8:45 Enhancing Grid Energy Storage with Predictive Battery Health Management***Wyatt Pena, VP of Operations, Ridgetop Group Inc.*

As grid-scale energy storage expands, maintaining battery health and reliability is critical to long-term performance and cost efficiency. The Battery Diagnostic and Prognostic System (BDPS) Tool Suite, developed in partnership with Idaho National Laboratory, integrates advanced modeling, predictive analytics, and prognostics to assess and mitigate battery degradation. This session explores how the BDPS incorporates key functional blocks of the IEEE 1856-2017 standard for Prognostics and Health Management to help optimize battery energy storage for grid applications.





# Grid-Scale Energy Storage

## 9:00 Improving the Deployment of Grid-Scale Battery Energy Storage

*Chris Wright, Senior Vice President, Project Technology, Spearmint Energy*  
As grid connected stationary energy storage continues to deploy at scale worldwide, the lithium-ion industry has many opportunities to advance safety, performance, and reliability. We will discuss a few of these opportunities and outline how industry research can bring demonstrable advantages to facilitating ESS projects.

## 9:00 Battery Booth Crawl with Bagels in the Exhibit Hall with Last Chance for Poster Viewing

### 9:30 Microgrid Solutions for Geographically Dispersed Operations

*Salman Sheikh, Dir Energy Mgmt Portfolio, Industrial Automation, Honeywell*

**Honeywell**

Commercial and industrial organizations are under pressure to produce and use energy more efficiently and reliably, while reducing environmental impact and improving safety and compliance. Learn how integrating a battery energy storage system (BESS), solar photovoltaics (PV), and a comprehensive microgrid control system can remedy loss of power resulting in plant shutdowns. Project goals address emissions reduction, grid reliability, integrating renewable power, and reducing energy costs.

## 10:00 Attendee Transition to Booth Crawl in Exhibit Hall

### 10:45 Planning for Energy Storage Augmentation

*Joseph O'Connor, Director, ESS Solutions, Engineering, Nuvation Energy*  
As batteries age, their capacity diminishes, making augmentation crucial to meet long-term electricity needs. Mixing old and new technologies on the same site poses unique challenges. This presentation explores strategies for integrating different generations of energy storage and designing systems that allow for seamless upgrades and expansion as technology evolves.

### 11:15 Power Partnerships Co-Presentation: Indian Energy Microgrid Solutions

*Jessica Cadreau, Vice President, Asset Management, Indian Energy*  
*Allen Cadreau, Vice President, Engineering, Indian Energy*

Indian Energy's mission is to develop holistic and sustainable opportunities so that we can maintain a traditional way of life that provides for our seventh generation. Indian Energy is a micro-grid development, systems integration and energy asset owner/operator focused primarily on creating strategic partnerships for Energy Security solutions for the Department of Defense and Energy Sovereignty Solutions for Native American Indian Tribes and the Indigenous Peoples around the world.

### 11:45 How Scientists Are Saving the Grid

*Wesley Chang, Assistant Professor, Mechanical Engineering & Mechanics, Drexel University*  
*Tobias Glossmann, PhD, Principal Engineer, Mercedes-Benz R&D North America*



## 12:15 pm Enjoy Lunch on Your Own

## TECHNO-ECONOMICS OF GRID INTEGRATION

### 1:10 Chairperson's Remarks

*Iola Hughes, Research Manager, Rho Motion*

### 1:15 Battery Storage: Latest Trends and Technology Innovation

*Iola Hughes, Research Manager, Rho Motion*

The storage market continues to be fastest growing battery demand market, with deployments in the US and Canada more than doubling in H1 2024 compared to the same period in 2023. The session will address several key questions: What are the biggest opportunities and challenges for the stationary storage market? What is the outlook for alternative tech? Who are the key and emerging players in the BESS market?

### 1:45 Economic Assessment of Hybrid Energy Storage for Multi-Energy Arbitrage in Wholesale Electricity Markets

*Ahmad Mayyas, PhD, Professor, Industrial & Systems Engineering, Khalifa University*

This presentation focuses on the commercial application of energy storage and economic potential of hybrid energy storage systems for multi-energy trading and arbitrage in electricity markets. Optimization model to maximize profits was developed to find a suitable hybrid energy system configuration and trading pattern. A case study of Li-ion battery and Reversible Fuel Cells was developed to evaluate the trading economics for electricity and hydrogen arbitrage in the United States.

### 2:15 Modeling Energy Storage across Potential Electricity Sector Futures

*Anna Schleifer, PhD, Researcher, Grid Planning and Analysis Center, National Renewable Energy Lab*

Energy storage is widely expected to be a key technology for maintaining grid reliability and reducing costs. Understanding the opportunities and challenges facing energy storage requires modeling at various geographic and temporal scales and resolutions. This presentation focuses on the application of long-term capacity expansion planning modeling to understanding the role of energy storage in the U.S. electricity sector across multiple potential futures, representing different electrification and technology mix pathways.

### 2:45 PANEL DISCUSSION: Economics of the Energy Storage Ecosystem

*Moderator: Iola Hughes, Research Manager, Rho Motion*

The nation's power grid is facing pivotal challenges. BESS is playing key roles in addressing them. BESS not only provides electricity to the grid but also offers essential services, such as balancing supply and demand. As a result, the stationary storage market is the fastest-growing sector in battery demand. The battery industry is poised to enhance safety, performance, and reliability, which are critical for the future of our energy ecosystem.

*Panelists:*

*Ahmad Mayyas, PhD, Professor, Industrial & Systems Engineering, Khalifa University*

*George Navarro, Director, Mission Critical Solutions, Facilities Engineering Operations & Maintenance, MC Dean Inc*

*Anna Schleifer, PhD, Researcher, Grid Planning and Analysis Center, National Renewable Energy Lab*

*Chris Wright, Senior Vice President, Project Technology, Spearmint Energy*

### 3:15 Transition to Closing Plenary Panel



## CLOSING PLENARY PANEL DISCUSSION

### 3:30 The Global Battery Industry Landscape: Opportunities & Illusions



*Moderator: Christina Lampe-Onnerud, PhD, Founder and CEO, Cadenza Innovation*

As the global battery industry experiences supercharged growth amidst shifting political dynamics, it faces both immense opportunities and significant challenges. This international panel of experts, spanning critical sectors such as investment, supply chain, cell design, manufacturing and deployment, will share their insights on the industry's future. They will discuss growth prospects, key challenges, and achievable milestones in the near and long term.

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*Tracy Mckibben, Founder and CEO, MAC Global Partners*

*William Acker, PhD, Executive Director, New York Battery & Energy Storage Technology Consortium*

### 4:30 Close of Conference





# Battery Power for Consumer Electronics

Battery Innovation for Portable Devices and Personal Mobility

## WEDNESDAY, MARCH 19

6:50 am Registration Open

1:00 pm Networking Luncheon

2:15 Dessert Break in the Exhibit Hall with Poster Viewing

### ADVANCED BATTERY DEVELOPMENT AND SAFETY

2:40 Organizer's Remarks

*Sarah Stockwell, PhD, Conference Producer, Cambridge EnerTech*

2:45 Chairperson's Remarks

*Jeff Bruce, Director Battery Technologies, Battery Development, Microsoft Corp.*

2:50 Unlocking Next-Level Battery Performance through Electrolyte Additives: Enhancing Capacity, Efficiency, and Lifetime

*Emily Dickens, Chief Commercial Officer, Octet Scientific*

Electrolyte additives offer a key, underexplored way to enhance both traditional and next-gen battery performance. This talk will cover the role of electrolyte optimization in boosting battery life, efficiency, and capacity. Octet, a leader in battery chemistry, specializes in developing custom electrolyte solutions. We'll highlight case studies and share insights into how the right chemistry can unlock new energy storage potential.

3:20 Energy-Dense Solid-State Lithium Batteries Enabled by Halide Electrolytes

*Lihong Zhao, PhD, Assistant Professor, Yao Research Group, University of Houston*

Despite the impressive cycle life observed in halide-based batteries under high stack pressures or at elevated temperatures, poor cathode-electrolyte stabilities still pose a significant challenge that results in rapid capacity decay under low pressure. Here, I will present strategies to improve the interfacial instability in halide-based solid-state batteries. We demonstrate stable cycling of solid-state cells using lithium metal anode for 1000 cycles at room temperature.

3:50 High-Voltage, Solvent/PFA-Free LCO Electrodes to Power Consumer Electronics and More

*Rajan Kumar, CEO & Founder, Ateios*

*Kevin Barry, Vice President Battery Engineering, Engineering, Ateios*

Current manufacturing of electrodes is limiting the ability to build longer lasting batteries to power consumer electronics due to thinner electrodes (less than 15 mg/cm<sup>2</sup>), instability at high voltages, and usage of toxic/forever chemicals that are being banned. Through Ateios Systems' Raicure platform, a solvent/forever chemical (PFAs)-free electrode manufacturing process has demonstrated that with high-voltage, lithium-cobalt oxide (LCO) at a high-energy dense electrode (over 20 mg/cm<sup>2</sup>), improved capacity retention and assembly yield to build better batteries at price parity.



4:05 Global Battery Compliance 2025

*Emily Klein, Engineer, Technical, Element Materials Technology*



A vital update on global battery compliance, covering regulatory requirements for 13 countries, simplifying complex regulations, offering clear guidance on compliance, safety, and upcoming changes. The focus on Li-ion batteries and small format packs is crucial for industries relying on portable power, helping businesses navigate international regulations, understand costs, and plan timelines effectively.

4:20 Refreshment Break in the Exhibit Hall with Poster Viewing and Best of Show Winner to be Announced

5:00 PFAS-Free Electrically Conductive Polymer Binders for Lithium-ion Batteries—From Environmentally Benign Solvents to Dry Electrode Processing

*Gao Liu, PhD, Group Leader, Energy Storage & Distributed Resources Division, Lawrence Berkeley National Lab*

Green processing of lithium rechargeable battery electrodes, free from NMP solvents and PFAS, is crucial for sustainability. Electrode binders ensure cohesion and adhesion while managing volume changes. CMC/SBR binders serve as eco-friendly alternatives to PVDF, delivering superior performance at lower costs. While silicon-based anodes offer high capacity, they face stability challenges. Innovative conductive polymers are being developed to enhance performance and improve battery longevity through environmentally friendly processing.

5:30 At the Intersection of Micromobility, Aftermarket Batteries, and Product Safety

*Ibrahim Jilani, Global Director, Consumer Technology, UL Solutions*

This presentation will go into the latest regulations for micromobility and their batteries, as well as the safety concerns of aftermarket batteries (whitepaper issued by UL Solutions in 2024) and its intersection with product safety.

6:00 Safe, Reliable, Predictable Medical Device Batteries

*Gordon Munns, PhD, Distinguished Scientist, Medtronic Energy and Component Center, Medtronic Inc*

Within the medical device market, lithium-ion batteries power everything from miniature implantable products to large hospital capital equipment. Delivering the utmost safety and reliability to our patients requires a unique focus on requirements and a clear understanding of the use conditions. Here, we will examine how some of these aspects influence the design and use of lithium-ion cells and packs in medical devices.

6:30 Close of Day

## THURSDAY, MARCH 20

8:00 am Registration and Morning Coffee

### OEM-DRIVEN DEVELOPMENT

8:55 Chairperson's Remarks

*Gordon Munns, PhD, Distinguished Scientist, Medtronic Energy and Component Center, Medtronic Inc*

9:00 Safety & Reliability in Replaceable Battery Products

*Jason Randel, PhD, Product Safety Engineer, Amazon Ring*

The global smart home security camera market is increasing year-over-year, and has reached over \$7 billion in 2022. Meanwhile, battery replacement regulations and evolving customer expectations mean that batteries in many consumer electronics will have to be easily accessible and replaceable by the end-user. This adds complexity and challenges for product safety and reliability, especially in outdoor products. This talk shares a customer-centric approach to addressing these challenges.

9:00 Battery Booth Crawl with Bagels in the Exhibit Hall with Last Chance for Poster Viewing



# Battery Power for Consumer Electronics

## 9:30 How AI Is Driving the Next Generation of Consumer Electronics and Increasing Battery Demands

*Jerry Hallmark, VP Customer Applications Engineering, Sales & Bus Dev, ENOVIX Corp*



AI is driving a wave of next generation consumer electronics with new advanced capabilities the likes of which have not been seen before. We will discuss these new use cases and applications and understand the implications for the battery system. We will explore how this translates into new requirements for batteries and how batteries can evolve to address the new energy demands of these new leading-edge AI products in mobile and AR.

## 9:45 100% Silicon Anodes, Powering the Wearable Devices of Tomorrow

*Tim Aanhanne, Sr Business Developer, Product Management, LeydenJar*



Silicon increases energy density in lithium-ion batteries by up to 70%, while graphite has reached its maximum capacity. As silicon anodes are reaching the market, how do they perform in a cell?

The latest nano-engineered silicon anodes enable silicon anodes to cycle for the lifetime of our devices, without any external pressure. These results make silicon anodes capable of providing the industry with the smallest high capacity batteries for novel AI-powered wearable devices. This session discusses common faced challenges in using silicon anodes in batteries for consumer electronics, and how material and process engineering handled these challenges up to product introduction.

## 10:00 Attendee Transition to Booth Crawl in Exhibit Hall

## 10:40 Chairperson's Remarks

*Gordon Munns, PhD, Distinguished Scientist, Medtronic Energy and Component Center, Medtronic Inc*

## 10:45 Challenges and Solutions for LFP and LMFP State-of-Charge Indication

*Yevgen Barsukov, PhD, Head, Algorithm Development, Battery Power Systems, Texas Instruments, Inc.*

*Charles Sestok, Battery Gauge Algorithms Engineer, Texas Instruments, Inc.*

This presentation examines various challenges related to measuring the state-of-charge in lithium iron phosphate (LFP) and lithium manganese iron phosphate (LMFP) battery types. It discusses factors affecting accuracy and suggests potential improvements. The aim is to enhance overall performance and reliability in energy storage systems.

## 11:15 AI-Based Smart Charging Algorithm for Next-Generation Li-ion Batteries

*Naoki Matsumura, Principal Engineer, Intel*

Li-ion batteries are widely used but degrade quickly with always-full and fast-charging. Current adaptive charging, which adjusts charge level and speed based on "if-then" scenarios, can prolong battery longevity if user behavior aligns with these scenarios. This session introduces context-based charging, which employs machine-learning and deep-learning to customize charging to individual usage patterns, extending longevity further. The session also covers implementation and application to future batteries.

## 11:45 Empowering the Future - American Made High Nickel, Si-C, Energy Dense Li-ion Batteries!

*Adam Carpenter, Senior Director, Sales & Marketing, Enpower Greentech*



Enpower Greentech (EGI) will supply American-made high performance batteries that are high nickel, silicon rich next-generation pouch

cells suited for advanced UAVs, drones, motorcycles, EVs, consumer electronics and robotics.

EGI is driving innovation and US battery manufacturing forward from Ann Arbor, MI with a new pilot and manufacturing line for H2-2025 as a leader in US-Made lithium-ion and lithium-metal batteries.

We will share about our technologies, breakthroughs, chemistry, design, and manufacturing processes. Attendees will hear about our most recent progress with Michigan manufacturing from our Zeeb Campus.

## 12:00 pm Cycle Depth Matters: Insights from Field Telemetry on Battery Life

*David Abram, PhD, Data Scientist, Microsoft Corp.*

Laboratory testing for mobile computing batteries often struggles to replicate real-world user behavior. Factors like temperature, high voltage, and discharge depth (DoD) significantly affect battery aging. Our analysis shows more cycles are achievable at less than 100% DoD. Field telemetry data also reveals that typical DoDs are much lower than 100%. This talk explores how field data can be used to improve battery testing and more accurately predict real-world aging.

## 12:15 Enjoy Lunch on Your Own

## 1:10 Chairperson's Remarks

*Emily Dickens, Chief Commercial Officer, Octet Scientific*

## 1:15 Understanding Battery Requirements for 3C Applications

*Jeff Bruce, Director Battery Technologies, Battery Development, Microsoft Corp.*

There is an assumption that battery requirements for 3C applications are way easier to meet than for EV or ESS; while true in many regards, there are still some difficult requirements for the newer technologies (think silicon, solid-state) to meet. This talk will review where LCO—and to a lesser extent—NCM are, and where Si and SSB need to be in order to use 3C applications.

## 1:45 Designing Batteries for Mixed-Reality Headsets and Augmented-Reality Glasses

*Karthik Kadirvel, PhD, Director, Battery Engineering, Meta Platforms*

This presentation explores innovative battery designs tailored for mixed reality headsets and augmented reality glasses. We examine the unique power demands and spatial constraints of these devices, proposing solutions that enhance energy efficiency, reduce weight, and extend operational lifespan. By integrating advanced materials and smart battery management systems, our research aims to improve user experience and device performance in immersive applications, paving the way for future developments in augmented technologies.

## 2:15 Sustainability in the Consumer Electronics Market

*Aagrim Sabharwal, Senior Group Manager, Global Supply Chain, Google*

The consumer electronics industry faces growing pressure to enhance battery sustainability. This presentation delves into battery circularity, including closing the raw material supply loop and addressing the scale problem of critical materials. Google's initiatives in promoting battery sustainability, such as the use of recycled cobalt, will be highlighted. Furthermore, the presentation will explore barriers to achieving greater sustainability in consumer electronics and discuss potential solutions for a more circular future.

## 2:45 Are High Energy Density Batteries Really Needed for Consumer Electronics?

*John Wozniak, PhD, President, Energy Storage and Power Consulting Inc.*

The primary selling feature for the majority of consumer electronic devices has been runtime. This has necessitated higher energy density



# Battery Power for Consumer Electronics

batteries to satisfy runtime targets. Although runtime is still a selling feature, the vast majority of consumers never use close to the maximum runtime their device can give them. What are consumers willing to pay for in an advanced battery?

## 3:15 Transition to Closing Plenary Panel

### CLOSING PLENARY PANEL DISCUSSION

#### 3:30 The Global Battery Industry Landscape: Opportunities & Illusions



*Moderator: Christina Lampe-Onnerud, PhD, Founder and CEO, Cadenza Innovation*

As the global battery industry experiences supercharged growth amidst shifting political dynamics, it faces both immense opportunities and significant challenges. This international panel of experts, spanning critical sectors such as investment, supply chain, cell design, manufacturing and deployment, will share their insights on the industry's future. They will discuss growth prospects, key challenges, and achievable milestones in the near and long term.

*Panelists:*

*Oliver Gross, MASc, SME Energy Storage and Conversion, Advanced Propulsion Technology, Stellantis*

*Joern Tinnemeyer, Senior Vice President & Chief Technology Officer, EnerSys*

*Tracy Mckibben, Founder and CEO, MAC Global Partners*

*William Acker, PhD, Executive Director, New York Battery & Energy Storage Technology Consortium*

## 4:30 Close of Conference

**MONDAY, MARCH 17****7:00 am Registration and Morning Coffee****4:45 pm Close of Day****TUESDAY, MARCH 18****7:00 am Registration Open and Morning Coffee****BATTERY PACK & CELL DEVELOPMENT****8:05 Organizer's Remarks***Victoria Mosolgo, Conference Producer, Cambridge EnerTech***8:10 Chairperson's Remarks***Ahmad Pesaran, PhD, Chief Energy Storage Engineer, National Renewable Energy Laboratory***8:15 Defining the State of Safety (SOS) for Lithium-Ion Batteries in EVs – A Discussion***Ahmad Pesaran, PhD, Chief Energy Storage Engineer, National Renewable Energy Laboratory*

There is significant demand for lithium-ion batteries (LIBs) in electric vehicles (EVs) and grid energy storage. However, LIBs use flammable electrolytes, making them prone to thermal runaway and fires. Defining a "State of Safety" for LIBs—both during operation and after incidents like car accidents—is crucial. We will explore how this concept can help users and first responders manage fire risks effectively.

**8:45 Metallized Plastic Current Collectors & All Ceramic Separators in High Specific Energy Cell Designs***Eric Darcy, PhD, Battery Technical Discipline Lead, Power Systems, NASA Johnson Space Center***9:15 Advancing Automotive Battery Pack Safety with Innovative Venting Units***Michael Harenbrock, PhD, Principal Expert, Engineering Electric Mobility, MANN+HUMMEL GmbH*

Vents are crucial for battery pack safety, especially under thermal runaway conditions. As battery cell chemistry and pack designs evolve, selecting appropriate venting units becomes increasingly important. The presentation provides an overview of regulatory and technological trends influencing vent design and introduces additional features like gas sensors and hot particle filters.

**9:45 Grand Opening Refreshment Break in the Exhibit Hall with Poster Viewing****BATTERY TESTING & FAILURE****10:30 Factors Influencing Battery Abuse with Immersion Cooling***Andre Swarts, PhD, Engineer, Automotive Propulsion Systems, Southwest Research Institute*

The benefits of direct battery immersion cooling are significant, not just during regular operation but also in preventing thermal runaway in extreme conditions. This presentation emphasizes the importance of flow rate and duration of flow after an abuse event when considering immersion cooling. The data provided is valuable for designing immersion cooling systems and for selecting appropriate test conditions when evaluating fluids.

**11:00 NMC vs. LFP: Thermal Runaway Propagation Pack Design Considerations Based on Chemistry***Brandon Bartling, Battery System Architect, 3M*

Battery pack designs and technical safety requirements are evolving at a rapid pace. Shifts in government policy, sourcing requirements, and consumer expectations are driving designs that are maximizing cell content in packs and introducing new chemistries. These changes can have a profound impact on how thermal propagation may take place in the pack. In this talk, we will compare and contrast the thermal runaway behavior of LFP cells vs. NMC cells and speak about how those differences could translate into new material design and philosophies for how to mitigate these challenges.

**11:30 Battery Safety in Aggressive and Abnormal Conditions: Some Insights from Recent Research***Tanvir Tanim, Battery R&D Engineer and Group Lead, Energy Storage Technology Group, Idaho National Laboratory*

Battery safety during fast charging or post-accident scenarios is critical for electric vehicle adoption. Lately significant efforts are being devoted to detecting early signs of failure using innovative methods and diagnostics. This presentation highlights Idaho National Laboratory's advancements in enhancing battery safety, offering valuable insights for consumers, first responders, and recovery teams in challenging conditions.

**12:00 pm Increasing Success and Safety in Battery Testing***Nicholas DiCeglie, Account Executive, Sales, Associated Environmental Systems*

Enhancing safety in battery testing processes is crucial to managing high-density testing in controlled, secure environments. This practice involves creating specialized scenarios that ensure safety measures are prioritized and optimized, helping to protect both equipment and personnel. In certain applications, larger batch testing in safely managed environments may be required. We will guide you through the necessary steps to ensure a safer approach to battery testing.

**12:15 SafeCore—An Internal Fuse to Help Prevent Thermal Runaway***Matthew Wang, VP, Tech Programs, Amionx*

SafeCore by Amionx is a material that is coated on the current collector in a battery cell that is responsive to current, temperature and voltage thresholds being reached. When one or any combination of these thresholds is reached, the material either: 1. Decomposes and cuts the flow of electricity in the cell, or 2. Creates a high impedance environment. In both cases, thermal runaway is prevented. Commercial progress and test results will be discussed.

**12:30 Networking Luncheon****1:15 Dessert Break in the Exhibit Hall with Poster Viewing****TRANSPORTATION AND REGULATION****1:45 Chairperson's Remarks***Chris Egloff, Vice President, Strategic Opportunities, Americase***1:50 International Code Council Report and Gap Analysis on Lithium Ion Batteries***Michael O'Brian, CEO, Code Savvy Consultants and Fire Chief, Brighton Area Fire Department*



**2:20 PANEL DISCUSSION: From Risk to Readiness: Lithium-Ion Batteries and Workplace Safety**

Moderator: Joel Chakkalakal, CEO, Lithium Hazmat, Critical Risk Solution  
Panelists:

Todd Mackintosh, Tech Specialist, Global Battery Systems Engineering, General Motors Co.

Jun Shin, Principal Commodity Manager, Battery Strategy, Amazon

Mike Pagel, Senior Consultant, Hazmat Safety Consulting

Chris Egloff, Vice President, Strategic Opportunities, Americase

**3:20 Refreshment Break in the Exhibit Hall with Poster Viewing****PLENARY KEYNOTE****3:50 Chairperson's Remarks and Presentation of the 2025 Shep Wolsky Battery Innovator Award**

Craig Wohlers, General Manager, Cambridge EnerTech

**3:55 Can We Have a Safe Lithium-Metal Battery?**

Shirley Meng, PhD, Director, Energy Storage Research Alliance (ESRA), Argonne National Laboratory; The Liew Family Professor, The University of Chicago

Along the pathway beyond 500 Wh/Kg, enabling lithium-metal anodes becomes a must. In this talk, I will introduce a new framework with which we can design lithium-metal anodes not only for high energy and long cycling, but also for safe operation. The design rule for possible anode-free architecture will also be discussed.

**4:15 The Importance of Passive Propagation Resistance in Battery Pack Design**

Troy Hayes, PhD, Director of Quality, Tesla

Over 30 years after the first Li-ion battery was produced, random thermal runaway events still occur. Despite the low probability of such incidents at the cell level, the volume of cells in EVs dictates that manufacturers prepare for these occurrences and ensure they do not create a significant risk for vehicle occupants. This talk will discuss the importance of passive propagation resistance and rigorous testing in safe battery pack design.

**4:40 A Comprehensive Analysis of Modern Silicon-Carbon Nanocomposite Negative Electrode Materials for Li-ion Batteries**

Jeff Dahn, FRSC, PhD, Professor of Physics and Atmospheric Science, NSERC/Tesla Canada Industrial Research Chair, Canada Research Chair, Dalhousie University

In this lecture I will describe the structure and properties of modern Si:C materials and show why they are so attractive compared to earlier alternatives. We will show results for Li-ion pouch cells containing 20% and 50% by weight of Si:C (balance graphite) where impressive cycle life has been achieved.

**5:05 This and Next-Generation Battery Development—A UK Perspective**

Martin Freer, PhD, CEO, Faraday Institution

The UK government set out a battery strategy in 2023, matched by a significant delivery program associated with the Faraday Battery Challenge, including the Faraday Institution

which coordinates the UK's battery research program. This presentation will provide an overview of the UK's battery strategy, the development of associated research programs, and highlight future focus areas for research and innovation.

**5:25 Reception in the Exhibit Hall with Poster Viewing****6:30 Close of Day****WEDNESDAY, MARCH 19****6:45 am Registration Open****7:00 Coffee Talk: Interactive Roundtable Discussions with Coffee & Pastries**

Roundtable discussions are informal, moderated discussions with brainstorming and interactive problem-solving, allowing participants from diverse backgrounds to exchange ideas and experiences and develop future collaborations around a focused topic.

**TABLE 1: Battery Raw Materials Supply Chain**

Moderator: Robert Privette, Manager, Business Development, Rechargeable Battery Materials North America, Umicore USA, Inc.

**TABLE 2: Li-ion NMC Fast Charging New Cells for E-Mobility**

Moderator: Shmuel De-Leon, CEO, Shmuel De-Leon Energy Ltd.

**TABLE 3: Electrolyte Developments: New Components and Approaches**

Moderator: Sam Jaffe, Vice President, Battery Solutions, E Source

**TABLE 4: Battery Pack System Cost and Safety – Will Future xEV Battery Packs Increase in Complexity or Simplify and How Will Cost and Safety Be Impacted?**

Moderator: Kevin Konecky, Battery and Energy Storage Systems Consultant, Total Battery Consulting

**TABLE 5: Innovations in Recycling Battery Materials & Second Life**

Moderator: Steven Sloop, President, OnTo Technology LLC

**TABLE 6: Opportunities and Barriers to Fast Charge in Automotive and Other Applications**

Moderator: Brian Barnett, PhD, President, Battery Perspectives

**TABLE 7: Provisional Patents to Due Diligence**

Moderator: Grant Ehrlich, PhD, Member, Intellectual Property & Technology, Stites & Harbison PLLC

**TABLE 8: Understanding the Pressure Effects on Li Metal Batteries**

Moderator: Bin Li, Senior Scientist & Joint Professor, Electrification, Oak Ridge National Laboratory

**TABLE 9: Challenges and Opportunities in the Distribution of Relaxation Times Analysis**

Moderator: Tom Ruether, Lecturer & Chair, Electrical Energy Systems, University of Bayreuth

**TABLE 10: How Will Emerging Technologies and Paradigms Impact the Future of Electrified Transportation?**

Moderator: Benny Varghese, PhD, Research Engineer, Energy Storage & Advanced Transportation, Idaho National Laboratory

**TABLE 11: Battery Testing & Aging**

Moderator: Gerald Sammer, PhD, Principal Business Development Manager, AVL List GmbH

**TABLE 12: Thermal Runaway**

Moderator: Lin Liu, PhD, Professor, Mechanical Engineering, University of Kansas

**TABLE 13: Consumer-Driven Trends in Battery Development for Personal Electronics**

Moderator: John Wozniak, PhD, President, ESP Consulting

**TABLE 14: Battery Electrolytes: Materials, Developments and Manufacturing**

Moderator: Monica Usrey, R&D, Orbia Fluor & Energy Materials



## UNDERSTANDING AND PREVENTING THERMAL RUNAWAY

### 8:25 Chairperson's Remarks

Lin Liu, PhD, Associate Professor, Mechanical Engineering, University of Kansas

### 8:30 Dynamics of Intra-Cell Thermal Front Propagation in Lithium-ion Battery Safety Issues

Jun Xu, PhD, Associate Professor Mechanical Engineering, Spencer Lab, University of Delaware

Understanding thermal front propagation (TFP) characteristics, such as front and velocity, is crucial for assessing energy release and temperature distribution for battery hazardous estimation. Recent studies assume that TR within cells propagates at a near-constant velocity, based on the reaction kinetics and thermal properties. Here, an intra-battery TR model is further proposed and it indicates that TFP velocity stabilizes when the front is distanced from the heat source.

### 9:00 Thermal Runaway Prognosis

Lin Liu, PhD, Associate Professor, Mechanical Engineering, University of Kansas

Thermal runaway, recognized as one of the major obstacles in the safe performance of lithium-ion batteries, has seriously hindered their large deployment. Therefore, it is crucial to develop new approaches that can accurately predict the failure of lithium-ion batteries and prevent catastrophic incidents. For this purpose, this study focuses on analyzing the failure of lithium-ion batteries due to the occurrence of thermal runaway using a data-driven framework called data-driven prognosis.

### 9:30 Whodunit? The Science behind Battery Fire Investigations

Ryan Spray, Principal Scientist, Polymer Science & Materials Chemistry, Exponent



Growing public awareness of lithium-ion battery thermal runaway hazards has coincided with increased scrutiny of batteries when they are found at fire scenes. Lithium-ion thermal runaway can occur due to heating from an external fire, even if they are not the cause of the fire. This presentation will encompass many analytical tools that may be relied upon when analyzing the role of lithium-ion batteries at fire scenes, as well as in the post-scene analysis of batteries and devices.

### 10:00 Why Energy Storage Safety Matters & How It Is Achieved



Thomas Farrell, Manager, Test & Validation, Fike Corp.

The increasing deployment of energy storage systems (ESS) globally requires a focus on understanding their hazards and ensuring reliable safety systems. Fike will present the dangers & causes of thermal runaway, an unpredictable fire hazard occurring in the lithium battery cells held in an ESS. Backed by years of internal test data, we'll review the effectiveness of thermal runaway safety solutions recommended by global codes & standards and will analyze various ESS installation scenarios and the comprehensive safety systems we'd recommend ensuring these hazards are mitigated.

### 10:15 Coffee Break in the Exhibit Hall with Poster Viewing

## POST INCIDENT

### 11:00 Better Batteries: The Quest for Technological Breakthroughs



Gautham Ramchandran, Staff Engineer, Solutions Consulting, Gamma Technologies

Designing better batteries, whether for cell designers or pack designers and integrators, requires a real-world understanding of the battery system being deployed and its influences on performance, reliability, life, and safety. This talk will demonstrate how Gamma Technologies' simulation solutions help drive commercially viable and successful products by expediting time-to-market and minimizing the need for expensive physical testing. Rooted in multi-physics, you will understand how to optimize designs and materials to meet performance requirements and leverage physics-based aging models and operating conditions to study the impact on the battery's lifespan. You will also learn how to combine electrochemical, fluid-thermal, mechanical, and controls to analyze and prevent catastrophic events such as battery thermal runaway propagation and gain deeper insights through an integrated systems approach.

### 11:15 Application of Ultrasonic Technology in Quality Control of Key Process Steps in Battery Mass Production Lines



Zhe Deng, CEO, General Manager's Office, Wuxi Topsound Technology Co., Ltd

Traditional battery detection methods struggle to achieve non-destructive inspection of battery internals. To address this, TOPSOUND has introduced an innovative ultrasonic detection technology, pioneering its application on battery production lines. This system provides comprehensive pre-inspection solutions for key processes, including slurry bubble detection, electrolyte wetting, degassing quality, and consistency. TOPSOUND's ultrasonic technology fills the gap in quality inspection, helping battery manufacturers reduce costs and enhance product quality more effectively.

### 11:30 How Fire Departments Respond to Battery Incidents

Michael O'Brian, CEO, Code Savvy Consultants and Fire Chief, Brighton Area Fire Department

This program will provide an overview of the various ways the fire service is interacting with battery incidents. This includes the rapid changes on mobility, EV, ESS, and indoor battery facilities. This program will provide best practices for consideration in developing emergency response plans and meeting current fire and building code requirements.

### 12:00 pm After the Fire

Joseph Nowikowski, Senior Practice Leader, M&E, Rimkus Consulting Group Inc.

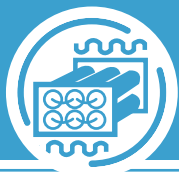
Those outside of the insurance industry have little to no understanding of what happens when an insured event occurs and what the process of subrogation is. This session will guide the audience through the process from production of a battery product to alleged failure—and explain the nuances that exist.

### 12:30 AI-Powered CT for High-Throughput Battery Inspection



Ievgeniia Morozova, CT Applications Specialist, X-Ray | CT, Nikon Metrology

The lithium-ion battery market is experiencing explosive growth, projected to reach US\$144 billion by 2030, up from an estimated US\$65.5 billion in 2024 and US\$54.5 billion in 2023. While traditional inspection methods like digital radiography fall short in detecting critical defects, computed tomography (CT) scanning has proven effective for battery integrity verification. However, conventional CT techniques struggle to keep pace



with the rapidly accelerating production demands of the electric vehicle (EV) industry. Current offline and sampling-based inspection approaches are insufficient for high-volume manufacturing and are primarily limited to cell development. To address this challenge, Nikon has developed a revolutionary AI-powered CT reconstruction algorithm. This customizable solution delivers significantly improved speed, accuracy, and image quality, enabling efficient high-throughput inspection of lithium-ion batteries.

## **12:45 ThermoShield New Paper-Based Technology -Thermo-Run-Away Mitigation**



*Rodger Mort, COO, PACT ThermoShield*

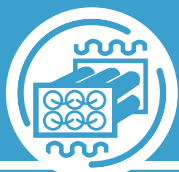
PACT developed a 100% paper-based solution for L-Ion battery pack safety (TR-Sleeve) that shuts down thermal-run-aways on the cellular level.

The technology is in the coatings that are applied to the paper. When the battery goes into thermal run-away, the coatings are released as a moisture barrier that cools and adds moisture to the environment. From the same technology PACT developed ThermoShield, a paper based product as a thermal management system for shipping and storing Lithium batteries. This unique invention mitigates thermal run-away by cooling and humidifying the environment. The hot electrolyte gases that escape from a battery condense against the paper. This process prevents the hot gases from finding oxygen and exploding. By controlling the environment, you prevent the explosion and prevent the propagation to other batteries. ThermoShield has been extensively tested: via SAE-G27 tests

## **1:00 Networking Luncheon**

## **2:15 Dessert Break in the Exhibit Hall with Poster Viewing**

## **2:45 Close of Conference**

**MONDAY, MARCH 17****7:00 am Registration and Morning Coffee****4:45 pm Close of Day****TUESDAY, MARCH 18****7:00 am Registration Open and Morning Coffee****CHARGING INFRASTRUCTURE OVERVIEW****8:05 Organizer's Remarks***Ian Murray, Associate Conference Producer, Cambridge EnerTech***8:10 Chairperson's Remarks***Wilhelm Pflöging, PhD, Head of Group Laser Materials Processing/Lithium-ion Batteries, Institute for Applied Materials (IAM-AWP), Karlsruhe Institute of Technology (KIT)***8:15 Lowering EV Adoption Barriers by Accelerating Access to Public Charging***Candace O'Melia, Strategist, EV Policy & Market Development, General Motors*

A large proponent of lowering the barriers to adoption is access to fast, convenient public charging infrastructure—an effort that is most successful when championed by a collaborative approach. Learn about cross-industry collaboration between OEMs, utilities, charge station operators, policymakers, and government agencies. By working collaboratively and across industries, GM works to ensure widespread access to technology, charging, and energy management for current and future EV drivers.

**8:45 Impact of EV Charging Infrastructure on the Grid***Anusha Pillay, Product Manager - Busways & Busplugs for Datacenters, Electrical Products, Siemens*

The rise in electric vehicles (EVs) has boosted global demand for charging infrastructure, impacting grid stability, load management, and efficiency across technical, economic, and regulatory dimensions. It addresses distribution network strain from peak demand and potential grid congestion. Integrating smart grid tech and renewables such as advanced metering, demand response, and battery storage is essential for enhancing grid performance amid evolving energy demands.

**9:15 Funding & Incentives Capturing for EV Charging: Navigating Opportunities, Complexities, and the Policy Landscape***Sarah King, Policy Principal, Advanced Energy United*

Billions of dollars in grants, rebates, loans, and incentives flood the EV charging landscape, offering powerful opportunities for organizations to accelerate deployment. However, navigating this complex funding environment, with its political and policy dynamics, can be challenging. This session explores available financial opportunities, strategies and tricks to identify and qualify for funding, and the complexities of the current and future policy landscape, helping organizations unlock successful project implementation and growth.

**9:45 Grand Opening Refreshment Break in the Exhibit Hall with Poster Viewing****FAST CHARGING R&D: SYSTEMS & METHODS****10:30 Unlocking Much Faster Charging Times***Brian Barnett, PhD, CTO, Nyobolt*

Nyobolt has commercialized fast-charge battery technology capable of full recharge in five minutes or less, as Nyobolt recently demonstrated with our 35kWh EV that was recharged in 4.5 minutes. This talk will highlight how adoption of fast-charge batteries also requires a technology with many charge-discharge cycles (allowing smaller batteries), often high discharge power, appropriate BMS, limited tradeoff in energy density and consideration of thermal management and available charging infrastructure.

**11:00 Optimising Battery System Design: Balancing Cost and Performance for a Better Real-World Charging Experience***Ian Campbell, PhD, CEO & Co-Founder, Breathe Battery Technologies*

How do you optimise battery system design to meet end user needs, while simultaneously driving down development costs? In his talk, Dr. Ian Campbell explores charge-time optimisation and how OEMs can develop smarter, cost-efficient battery systems. He shares data-driven examples of adaptive charging strategies that enhance performance in real-world scenarios, including low temperatures and different starting states of charge.

**11:30 Beyond the Plug: Exploring Wireless, Swapping, and Off-Grid EV Charging***Shazan Siddiqi, Senior Technology Analyst, IDTechEx*

Alternative EV charging technologies beyond conductive cable-based solutions include wireless charging, which allows charging without cables; battery swapping, which replaces depleted batteries with fully charged ones in minutes; and off-grid solutions like solar-powered or generator-based charging systems, providing power in remote areas or during grid outages. These technologies enhance convenience, reduce dependency on grid infrastructure, and support faster and more flexible EV adoption.

**12:00 pm Healthier USB-C Charging for Sustainable Products Using Electrodynamic Charge Control***Daniel Higgs, Director of Business Development, BD, Iontra Inc*

This presentation will discuss the importance of electrodynamic charge control in maintaining maximum battery health for more sustainable, USB-C-powered products. We'll discuss our intelligent charging approach for mass-market adoption and present battery performance data, hardware and software integration, and product impacts for consumer and industrial electronics. Contact [daniel.higgs@iontra.com](mailto:daniel.higgs@iontra.com) to set up a no-cost proof of concept project.

**12:30 Networking Luncheon****1:15 Dessert Break in the Exhibit Hall with Poster Viewing****FAST CHARGING R&D: BATTERY****1:45 Chairperson's Remarks***Benny Varghese, PhD, Research Engineer, Energy Storage & Advanced Transportation, Idaho National Laboratory***1:50 Advanced Lithium-ion Battery Fast Charging: Enhancing Performance, Longevity, and Safety for Electric Vehicles***Vallabha Rao Rikka, PhD, Research Scientist IV, UL Research Institutes*

Cathode materials in lithium-ion batteries suffer rapid capacity fade during fast-charging due to transition metal (TM) dissolution, especially





at high voltages and temperatures. Our study identifies an increase in cell temperature as the primary driver of Fe dissolution in LiFePO<sub>4</sub>/graphite cells during 4C cycling. After 400 cycles, Fe dissolution accelerates, limiting cycle life to 956 cycles. Despite advancements, mitigating TM dissolution remains challenging, and still not fully understood.

### 2:20 Ultrafast Laser Processing of Battery Electrodes for Faster Charging and Improved Electrolyte and Electrode Wetting

Ryan Tancin, Staff Scientist, National Renewable Energy Laboratory

Ultrafast lasers can be used to create micro-structures in battery electrodes that provide homogeneous wetting and greatly improve high-rate charging. Our cost-analysis simulations using the Battery Performance and Cost model indicate that adoption of ultrafast-laser electrode processing adds minimal additional cell costs, approximately \$1.50/kWh. We present a detailed characterization of experimental laser ablation for common battery electrodes, enabling informed choices of laser parameters and accurate predicting of processing throughput.

### 2:50 Upscaling Advanced 3D Electrode Architectures for Fast Charging Batteries

Wilhelm Pfleging, PhD, Head of Group Laser Materials Processing/Lithium-ion Batteries, Institute for Applied Materials (IAM-AWP), Karlsruhe Institute of Technology (KIT)

Laser structuring of thick film electrodes has been advanced to pilot-line level for the production of 3D batteries. Fast charging performance is significantly improved, while lithium plating is suppressed. In addition, capacity retention is dramatically enhanced and cycle lifetime can be at least doubled. Upscaling of the 3D battery concept is demonstrated for both pouch and cylindrical cells, offering significant advantages in increasing energy density, while reducing production costs.

### 3:20 Refreshment Break in the Exhibit Hall with Poster Viewing

## PLENARY KEYNOTE

### 3:50 Chairperson's Remarks and Presentation of the 2025 Shep Wolsky Battery Innovator Award

Craig Wohlers, General Manager, Cambridge EnerTech



### 3:55 Can We Have a Safe Lithium-Metal Battery?

Shirley Meng, PhD, Director, Energy Storage Research Alliance (ESRA), Argonne National Laboratory; The Liew Family Professor, The University of Chicago

Along the pathway beyond 500 Wh/Kg, enabling lithium-metal anodes becomes a must. In this talk, I will introduce a new framework with which we can design lithium-metal anodes not only for high energy and long cycling, but also for safe operation. The design rule for possible anode-free architecture will also be discussed.



### 4:15 The Importance of Passive Propagation Resistance in Battery Pack Design

Troy Hayes, PhD, Director of Quality, Tesla

Over 30 years after the first Li-ion battery was produced, random thermal runaway events still occur. Despite the low probability of such incidents at the cell level, the volume of cells in EVs dictates that manufacturers prepare for these occurrences and ensure they do not create a significant risk for vehicle occupants. This talk will discuss the importance of passive propagation resistance and rigorous testing in safe battery pack design.



### 4:40 A Comprehensive Analysis of Modern Silicon-Carbon Nanocomposite Negative Electrode Materials for Li-ion Batteries

Jeff Dahn, FRSC, PhD, Professor of Physics and Atmospheric Science, NSERC/Tesla Canada Industrial

Research Chair, Canada Research Chair, Dalhousie University  
In this lecture I will describe the structure and properties of modern Si:C materials and show why they are so attractive compared to earlier alternatives. We will show results for Li-ion pouch cells containing 20% and 50% by weight of Si:C (balance graphite) where impressive cycle life has been achieved.



### 5:05 This and Next-Generation Battery Development—A UK Perspective

Martin Freer, PhD, CEO, Faraday Institution

The UK government set out a battery strategy in 2023, matched by a significant delivery program associated with the Faraday Battery Challenge, including the Faraday Institution which coordinates the UK's battery research program. This presentation will provide an overview of the UK's battery strategy, the development of associated research programs, and highlight future focus areas for research and innovation.

### 5:25 Reception in the Exhibit Hall with Poster Viewing

### 6:30 Close of Day

## WEDNESDAY, MARCH 19

### 6:45 am Registration Open

### 7:00 Coffee Talk: Interactive Roundtable Discussions with Coffee & Pastries

Roundtable discussions are informal, moderated discussions with brainstorming and interactive problem-solving, allowing participants from diverse backgrounds to exchange ideas and experiences and develop future collaborations around a focused topic.

#### TABLE 1: Battery Raw Materials Supply Chain

Moderator: Robert Privette, Manager, Business Development, Rechargeable Battery Materials North America, Umicore USA, Inc.

#### TABLE 2: Li-ion NMC Fast Charging New Cells for E-Mobility

Moderator: Shmuel De-Leon, CEO, Shmuel De-Leon Energy Ltd.

#### TABLE 3: Electrolyte Developments: New Components and Approaches

Moderator: Sam Jaffe, Vice President, Battery Solutions, E Source

#### TABLE 4: Battery Pack System Cost and Safety – Will Future xEV Battery Packs Increase in Complexity or Simplify and How Will Cost and Safety Be Impacted?

Moderator: Kevin Konecky, Battery and Energy Storage Systems Consultant, Total Battery Consulting

#### TABLE 5: Innovations in Recycling Battery Materials & Second Life

Moderator: Steven Sloop, President, OnTo Technology LLC

#### TABLE 6: Opportunities and Barriers to Fast Charge in Automotive and Other Applications

Moderator: Brian Barnett, PhD, President, Battery Perspectives

#### TABLE 7: Provisional Patents to Due Diligence

Moderator: Grant Ehrlich, PhD, Member, Intellectual Property & Technology, Stites & Harbison PLLC

#### TABLE 8: Understanding the Pressure Effects on Li Metal Batteries

Moderator: Bin Li, Senior Scientist & Joint Professor, Electrification, Oak Ridge National Laboratory

#### TABLE 9: Challenges and Opportunities in the Distribution of Relaxation Times Analysis



# Fast Charging & Infrastructure

Moderator: Tom Ruether, Lecturer & Chair, Electrical Energy Systems, University of Bayreuth

## TABLE 10: How Will Emerging Technologies and Paradigms Impact the Future of Electrified Transportation?

Moderator: Benny Varghese, PhD, Research Engineer, Energy Storage & Advanced Transportation, Idaho National Laboratory

## TABLE 11: Battery Testing & Aging

Moderator: Gerald Sammer, PhD, Principal Business Development Manager, AVL List GmbH

## TABLE 12: Thermal Runaway

Moderator: Lin Liu, PhD, Professor, Mechanical Engineering, University of Kansas

## TABLE 13: Consumer-Driven Trends in Battery Development for Personal Electronics

Moderator: John Wozniak, PhD, President, ESP Consulting

## TABLE 14: Battery Electrolytes: Materials, Developments and Manufacturing

Moderator: Monica Usrey, R&D, Orbia Fluor & Energy Materials

## WHERE CHARGING R&D MEETS INFRASTRUCTURE EXPANSION

### 8:25 Chairperson's Remarks

Shazan Siddiqi, Senior Technology Analyst, IDTechEx

### 8:30 Ripple-Heating and Safety-Monitoring (*in-situ* EIS) Based Fast-Charging Strategies at Low Temperature for Li-ion Batteries

Xiao Cai, CTO & Founder, R&D, Stropower

In response to the risk of lithium plating caused by low-temperature (-20°C) fast-charging of lithium-ion batteries, this report proposes a multidimensional collaborative optimization scheme: ripple preheating coupled fast charging technology (5°C threshold) and dynamic temperature control charging technology. Meanwhile, constructing an online detection system for lithium plating based on *in-situ* EIS and other physical signals, and real-time current regulation is used to achieve lithium plating risk prediction and active suppression.

STROPOWER

### 9:00 PANEL DISCUSSION: Where Fast Charging R&D and Infrastructure Expansion Converge

Moderator: Sarah King, Policy Principal, Advanced Energy United

Global EV adoption will require faster reliable charging and the significant expansion of public charging infrastructure. Hear from our experts as they aim to facilitate this transition through highlighting recent technological advancements in fast charging and exploring the key challenges and opportunities in scaling EV charging infrastructure.

Panelists:

Kaylan Mills, Assistant Manager, Charging Network Development, General Motors

Sai Shivareddy, PhD, CEO & Co-Founder, Nyobolt

Chris Carr, SVP of Sales and Business Development, Blink Charging

### 10:00 Binder-Free Electrodes Enabling High-Rate Li-ion Battery

Sean Brahim, R&D Manager, Energy Storage Devices, YTC America, Inc.

YTCA has developed binder-free anodes and cathodes containing carbon nanotube (CNT) in lieu of polymer binder as electrodes for Li-ion batteries. Our proprietary processing of CNT into viscous organic or water-based slurry without surfactant or dispersant eliminates the need

YAZAKI  
YTC AMERICA INC.

for organic binder and carbon black additives in both anode and cathode electrodes. Moreover, the absence of binder in electrode formulations facilitates the transition away from costly and toxic NMP solvent for slurry preparations. We have demonstrated scalable R2R coating of binder-free graphite and lithium titanium oxide (LTO) anodes, as well as binder-free NMC and LFP cathodes in IPA solvent. LiB pouch cells rated at 1.5 Ah and 3 Ah were subsequently assembled containing the binder-free electrode combinations. LiB cell performance advantages include superior lifetime cycling, 10x faster charging at 10C rate, and 2x higher capacity retention than conventional LTO cells with binder.

### 10:15 Coffee Break in the Exhibit Hall with Poster Viewing

## CHARGING SEAMLESSLY AND SECURELY

### 11:00 The Future of Fast Charging: A User's Wishlist

Antony Martin, Lead Product Manager - Charging, Lucid Motors

Many fast charging stations lack the basic amenities that ICE drivers can expect from even the barest of gas stations. This presentation outlines the improvements that must be made to the EV charging customer's experience to not only make EV adoption more palatable, but the more desirable option.

### 11:30 ChargeX Consortium: Latest Efforts in Addressing Charging Reliability and User Experience

Benny Varghese, PhD, Research Engineer, Energy Storage & Advanced Transportation, Idaho National Laboratory

The presentation will provide an overview of the ChargeX multi-lab industry consortium and its efforts to address public EV charging reliability over the past year. The talk will also discuss the various aspects of user experience during the charging process and how they factor into EV range and charging anxiety.

### 12:00 pm Understanding the EVSE Ecosystem: Strategic Cyber Initiatives and Guidance for Advancing Secure Fast Charging

Sabrina Rodriguez, Research Engineer, Southwest Research Institute (SwRI)

As electric vehicle (EV) charging infrastructure expands, so does the risk of cyberattacks. This presentation addresses the role of cybersecurity in EV charging infrastructure, highlighting high-profile cyberattacks, as well as cybersecurity best practices and guidance solutions. This presentation focuses on known vulnerabilities and exploits seen in EV charging infrastructure, as well as discusses Southwest Research Institute's (SwRI) applied research conducted on EV chargers (L2 and Direct Current Fast Charging (DCFC)).

### 12:30 Regional Electrification Dynamics and Fast-Charging Battery Innovations: Market Prospects, Segment Applications, and Core Technologies

Xuan He, General Manager of SEVB Product Line, Power Battery product line, Sunwoda Mobility Energy Technology Co., Ltd.

SEVB 欣旺达动力

Global electrification initiatives exhibit substantial regional divergence in technological trajectories and market penetration rates. Fast-charging battery series, pivotal in optimizing energy replenishment efficiency and enhancing user experience, necessitate systematic investigation of their commercial viability, sector-specific implementations, and enabling technological frameworks. This report conducts a comparative analysis of electrification dynamics across principal markets (China, European Union, and North America), complemented by performance characteristics and deployment profiles of proprietary fast-charging battery series developed for diverse automotive application scenarios (BEV/



MARCH 18 - 19, 2025

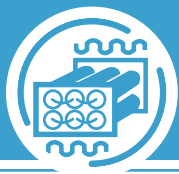
## Fast Charging & Infrastructure

PHEV/HEV). Building upon fundamental material characteristics and electrochemical limitations of current fast-charging architectures, this investigation further delineating critical innovation pathways in chemistry development, safety design and other pivotal technologies.

**1:00 Networking Luncheon**

**2:15 Dessert Break in the Exhibit Hall with Poster Viewing**

**2:45 Close of Conference**

**WEDNESDAY, MARCH 19****6:50 am Registration Open****1:00 pm Networking Luncheon****2:15 Dessert Break in the Exhibit Hall with Poster Viewing****MATERIALS DESIGN****2:40 Organizer's Remarks***Victoria Mosolgo, Conference Producer, Cambridge EnerTech***2:45 Chairperson's Remarks***Chen Ling, PhD, Principal Scientist, Toyota Research Institute of North America***2:50 Engineering of Solid-State Sulfide Electrolytes, Other Materials, and the Prototyping of All-SSB***Lane Crofton, R&D Research Engineer, R&D Aerospace Defense & Performance ADP, SAFT America*

Solid-state batteries provide an excellent opportunity for innovation, thanks to their ability to combine higher energy density, greater power, and increased safety, but require new materials and processes. This talk will review Saft's position in the technological development of all-solid-state batteries (ASSB) and our progress in working with sulfide electrolytes. Topics of discussion include screening for sulfide and silicon materials, creation of protective layers, and growth areas for prototype development.

**3:20 Computation Design for Materials***Chen Ling, PhD, Principal Scientist, Toyota Research Institute of North America*

Lethargic oxygen evolution reaction (OER) hinders proton exchange membrane water electrolyzer adoption for green hydrogen production. While iridium- and ruthenium-based catalysts are prevalent, this study proposes a high-throughput screening approach, predicting 61 potential acid OER candidates from 6912 pyrochlore compounds, including promising p-block metal dopants. These findings highlight pyrochlore compounds as versatile materials for various applications.

**3:50 Next-Gen Batteries: Bipolar Technology for Better KPIs at Lower Costs***Dr. Reik Laubenstein, Sr Engineer, High Voltage Battery Systems, IAV Automotive Engineering Inc*

Over decades, LIBs for mobility applications have improved in efficiency and cost. Yet, high prices and low ranges concern electric vehicle buyers. Unlike traditional LIBs, the bipolar architecture aims to maximize volume utilization and to reduce electrical losses and costs for components. This presentation covers IAV's journey in bipolar technology for EV batteries since 2014, highlighting the key features, benefits and challenges.

**4:20 Refreshment Break in the Exhibit Hall with Poster Viewing and Best of Show Winner to be Announced****BATTERY SYSTEMS AND TESTING****5:00 Lithium Battery Packs and Battery Management Systems for Racing Applications***Derek Barger, Chief of Electronics, Engineering, Daroni Aerospace*

We will examine custom battery packs engineered for racing vehicles and explore how these innovations are being adapted for use in the aerospace industry, particularly in electric vehicle vertical takeoff and landing (eVTOL) aircraft. This discussion will cover their implications for safety,

battery pack design, and the circular battery pack recycling system.

**5:30 Fast Track to Superior Automotive Batteries: Virtual System Validation and AI-Driven Testing***Gerald Sammer, PhD, Principal Business Development Manager, AVL List GmbH*

The proposal highlights the use of advanced AI and virtual testing methods to enhance battery performance and quality for automotive applications in much shorter time. By integrating state-of-the-art simulation tools and virtualization solutions, this approach allows for rapid, cost-effective development and optimization of battery systems. Utilizing predictive modeling and iterative design optimization, engineers can explore diverse scenarios, accelerating the development process and significantly improving quality and cycle-life of Li-ion batteries.

**6:00 Big Data for the Diagnosis and Prognosis of Deployed Battery Systems***Matthieu Dubarry, PhD, Assistant Researcher, Battery Testing & Evaluation & Modeling, University of Hawaii*

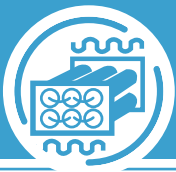
The diagnosis and prognosis of deployed batteries is complex because cells might never experience controlled conditions during operation. This work presents a new methodology for diagnosis that used real observed solar irradiance, modeled clear sky irradiance, a load usage model, and synthetically-generated battery data from a battery digital twin to diagnose the degradation of commercial Li-ion batteries connected to photovoltaic systems.

**6:30 Close of Day****THURSDAY, MARCH 20****8:00 am Registration and Morning Coffee****THERMAL RUNAWAY****8:25 Chairperson's Remarks***Gerald Sammer, PhD, Principal Business Development Manager, AVL List GmbH***8:30 Presentation to be Announced****9:00 Examination of Passive and Active Approaches to Mitigation of Thermal Runaway Propagation***Stanislav I. Stoliarov, PhD, Professor, Fire Protection Engineering, University of Maryland***9:00 Battery Booth Crawl with Bagels in the Exhibit Hall with Last Chance for Poster Viewing****AI BATTERY MANAGEMENT SYSTEMS****9:30 Accelerating the Battery Design Process: A Physics-Based Modeling Approach***Johan Sundqvist, VP Sales, Sales, COMSOL Inc*

Designing high-performance, durable, and safe batteries requires a detailed understanding of battery technology and the underlying physical processes. The physics-based modeling approach in COMSOL helps designers to create accurate simulations of batteries, thus reducing the need for time-consuming and expensive experiments. The COMSOL software provides modeling solutions of batteries ranging from simulating micro-structures within the battery's porous electrode to the battery pack scale. In this presentation, we will explore various aspects of electrochemical modeling for battery cells, upscaling to system-level







modeling and incorporating thermal management solutions for battery packs.

#### 9:45 Pulsetrain: The New Era of AI-Driven and Fully Integrated Battery Management Systems

PULSETRAIN

Niclas Lehnert, Chief Operations Officer, PULSETRAIN GmbH

Pioneering revolutionary battery management system technology to address today's challenges within electromobility.

#### 10:00 Attendee Transition to Booth Crawl in Exhibit Hall

### PREDICTING BATTERY DEGRADATION

#### 10:45 A Method for Estimating the Useful Lifetime of Lithium-ion Battery

Cher-Ming Tan, PhD, Director, Center for Reliability Sciences & Technologies, Chang Gung University

Current method of useful life is based on the SoH monitoring of LiB and perform various methods to estimate from the trend of SoH degradation, and usually these LiB cells are already connected. This talk presents a method where the estimation is done on the first charge-discharge cycle of LiB cell, allowing for good selection of cells for pack building. This method is verified experimentally.

#### 11:15 Predicting Rapid Degradation Onset in Lithium-ion Batteries during Real-Time Operation Using Machine Learning

Vikas Tomar, PhD, Faculty Lead, Innovation and Commercialization, School of Aeronautics and Astronautics, Purdue

This talk presents low data machine learning models for capacity degradation trajectory and EOL of commercial lithium-ion batteries (LIBs) using the data from the initial historical cycles, employing a recently developed machine learning approach based on a capacity degradation network (CD-Net). Additionally, the machine learning models are employed to predict the knee point in the degradation curve showing applicability to accident scenario. Finally, data is shown in real world operations.

#### 11:45 Next-Generation Wireless Battery Smart Sensor



Peter Lin, Sales & Operation V. P., Grace Connection Microelectronics Limited

Pei-Wei Chen, CEO, Grace Connection Microelectronics Ltd

Co-develop with global leading infrastructure solution company: Delta Electronics. Per-cell wireless technology resolves traditional wire-line battery sensing issues: low voltage accuracy, heavy weight, low reliability & no simultaneous measurement of all cells. Dramatically improve system safety by resolving the issue of ignition points caused by the failure of high-voltage isolation components used in signal communication. Innovative (& patented) wireless daisy-chain architecture to eliminate signal collision issues caused by massive wireless devices operating in the same space. Using non-detectable wireless technology and enhanced protocol to ensure robust communication as wire-line. Easy to implement and installation. 52-cell module ready to demonstrate. 416-cell (one rack) demo system will be ready in Q2. System performance data will be presented in conference.

#### 12:00 pm Can We Trust AI for Battery Design and Testing?



Marius Koestler, VP AI for Batteries, Monolith AI

AI is transforming industries, offering powerful new tools but also raising debates around regulation and trust. In engineering, AI can streamline processes, enhance innovation, and reduce costs—but is it always appropriate?

In this talk, Marius Andreas Koestler explores how AI and machine learning can drive faster time-to-market, improved design, and cost savings, with a focus on battery technology. Through practical examples, he'll demonstrate AI's impact on optimising battery performance, energy storage, and predictive maintenance, and discuss future opportunities and challenges for AI in engineering.

#### 12:15 Enjoy Lunch on Your Own

### CONTROLS & MODELLING

#### 1:10 Chairperson's Remarks

Monica Marinescu, PhD, Senior Lecturer Mechanics of Materials, Mechanical Engineering, Imperial College London

#### 1:15 Model-Based Control and Machine Learning for Lithium-ion and Lithium-Sulfur Batteries

Hosam K. Fathy, PhD, Mechanical Engineering, University of Maryland College Park

This talk will provide a high-level exploration of some of the key challenges and opportunities in the model-based control of both lithium-ion and lithium-sulfur batteries, including both solid and liquid electrolyte Li-S batteries. Much of the talk will focus on emerging opportunities for test trajectory optimization and machine learning for both battery types, with a focus on Li-S batteries.

#### 1:45 Estimating Parameters of Physics-Based Model of Lithium-Metal Battery Cells Using EIS

Gregory L. Plett, PhD, Professor, Electrical & Computer Engineering, University of Colorado, Colorado Springs

Lithium-metal batteries hold promise for heavy-duty transportation due to their high energy density, but before they can be adopted, battery-management systems (BMS) must be developed to monitor and control their operation. This talk introduces a method to parameterize a physics-based model of these cells for BMS application that uses simple tests performed on electrochemical-impedance-spectroscopy (EIS) equipment.

#### 2:15 A Comparative Review of Simplified Battery Models Used for Advanced Controls

Scott Trimoli, PhD, Professor, Electrical & Computer Engineering, University of Colorado, Colorado Springs

State-of-the-art BMS rely on accurate battery models and specialized algorithms to obtain useful estimates of the battery state in order to ensure proper performance and safe operation. Most practical models are simplifications, and thus must trade off high accuracy for computational efficiency. This talk examines the implications of using various simplified models in the performance of key BMS tasks.



### 2:45 Understanding, Modeling, Validating, and Predicting Lithium-ion Battery Degradation

*Monica Marinescu, PhD, Senior Lecturer Mechanics of Materials, Mechanical Engineering, Imperial College London*

This presentation covers understanding lithium-ion battery degradation, how to model it, and how close those models are getting to usefully predict lifetime. We will describe our efforts to model lithium plating, SEI layer growth, positive electrode (cathode) decomposition, unequal degradation *in silicon* carbon composite electrodes, particle cracking, electrolyte consumption and cell dry-out, and how multiple degradation mechanisms are coupled with each other and contribute towards accelerated degradation (the knee point/cliff-edge/etc).

### 3:15 Transition to Closing Plenary Panel

## CLOSING PLENARY PANEL DISCUSSION

### 3:30 The Global Battery Industry Landscape: Opportunities & Illusions



*Moderator: Christina Lampe-Onnerud, PhD, Founder and CEO, Cadenza Innovation*

As the global battery industry experiences supercharged growth amidst shifting political dynamics, it faces both immense opportunities and significant challenges. This international panel of experts, spanning critical sectors such as investment, supply chain, cell design, manufacturing and deployment, will share their insights on the industry's future. They will discuss growth prospects, key challenges, and achievable milestones in the near and long term.

#### *Panelists:*

*Oliver Gross, MASc, SME Energy Storage and Conversion, Advanced Propulsion Technology, Stellantis*

*Joern Tinnemeyer, Senior Vice President & Chief Technology Officer, EnerSys*

*Tracy Mckibben, Founder and CEO, MAC Global Partners*

*William Acker, PhD, Executive Director, New York Battery & Energy Storage Technology Consortium*

### 4:30 Close of Conference

# BATTERY

## VENTURE, INNOVATION & PARTNERING

March 18-19, 2025

Loews Royal Pacific Resort  
Orlando, FL

## Financing Innovation & Commercialization of Emerging Technologies

**The Battery Venture, Innovation & Partnering conference will be held, for the second time, in conjunction with the International Battery Seminar & Exhibit, at the same location.**

In recent years, it has become increasingly difficult for battery start-ups to raise cash and find alternative sources of capital, a stark change from just a few years ago. The trend toward LFP and lower cost batteries coming out of China, the slowdown of the EV market, and political uncertainty all add to the challenges in the financial markets. It's never been more critical to bring together leading battery innovators—CEOs/founders, early and late-stage investors, with corporate executives from both the battery and the automotive side, to discuss what the future of financing and innovation looks like for batteries, and what companies need to do to survive and thrive, particularly in the US.

### Panel Themes:

- Early-Stage Investor Panel
- Beyond Late-Stage Investing in Batteries
- Late-Stage Investment & Scaling to Manufacturing
- How to Build a Domestic Battery Supply Chain in US
- Li-ion and Na-ion Technology and the Growth and Demand for ESS
- Battery Applications for ESS
- EV Market Review—What Is the Impact on the Battery Market?
- Emerging Technologies & Continuing to Invest in Innovation

### Advisory Board for the Battery Venture, Innovation & Partnering Conference:



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**Michal Wolkin**  
Former Director, GM  
Ventures, Battery &  
Electrification

[InternationalBatterySeminar.com/Investor](https://InternationalBatterySeminar.com/Investor)



# HOTEL & TRAVEL INFORMATION

## Conference Venue & Host Hotel:

Loews Royal Pacific Resort

6300 Hollywood Way

Orlando, FL 32819 USA

Discounted Room Rate: \$295 s/d

Discounted Room Rate Cut-Off: February 4, 2025

## Additional Hotels:

Loews Sapphire Falls Resort

6601 Adventure Way

Orlando, FL 32819 USA

Discounted Room Rate: \$259 s/d

Discounted Room Rate Cut-Off: February 4, 2025

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- No Commute! Conference taking place at the same location.
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- Waterways, roads and walking paths connect this Premier resort hotel to Universal Studios Florida™, Universal's Islands of Adventure™ and Universal CityWalk™. Guests of Premier and Preferred hotels can get around easily with complimentary water taxis and shuttle services. Universal's Volcano Bay™ is accessible only by complimentary shuttle.
- Enjoy the themed resort with plenty of sun, sand, and palm trees!
- Variety of on-site restaurants and lounges.

For more information on additional hotels and booking your discounted room, visit the [Hotel & Travel page](#)



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## 2024 Sample Attendee List

 3M Purification, Sr Tech Lead	 Amazon, Sr Battery Engineer, Kulper	 Apple Inc, Dir Battery Technology	 Bank of America, Sr VP & Sr Relationship Mgr, AutoTech	 BenQ Materials Corp, Deputy Dir, Advanced Battery Materials	 BMW Grp, Sr Battery Technology Engineer, Battery Engineering	 Boeing, Industrial Engineer, Boeing Cabot Corp, Scientist, Battery Materials	 Corning Inc, Battery Technology Mgr, Environmental Technologies Daimler Truck N.America, Battery Materials Engineer	 North America -Powertrain Engineering- Dow Chemical Co, Assoc Research Scientist, Engineered Materials	 Dyson Ltd, Principal Engineer, Energy Storage Dev
 ExxonMobil, Sr Research Engineer	 FDA, Engineer, ORA	 Federal Aviation Administration, Engineer, Ofc of Hazardous Materials Safety	 Ford Motor Co, Battery Research Engineer, Energy Storage Research	 Garmin Intl Inc, Advanced Battery Engineer	 General Motors Co, Sr Process Engineer, Electrochemical, Cell Mfg Engineering	 Google, Sr Strategic Sourcing Mgr, Supply Chain Technical Infrastructure	 Henkel Corp, VP Automotive Electronics & eMobility NAMEX	 Honda Automobile R&D Ctr, Chief Engineer, Energy Storage Systems	 Honeywell Intl Inc, Dir Regulations, Electrification & Sensing & Safety Technologies Hyundai Mobis Tech Ctr,
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42<sup>nd</sup>  
Annual

# International Battery

SEMINAR &amp; EXHIBIT

March 17-20, 2025

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### Want to Register by Phone?

Contact our Registration department at 781-972-5400 or Toll-free in the US at 888-999-6288.

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The International Battery Seminar encourages attendees to gain further exposure by presenting their work in the poster sessions. To secure an onsite poster board and/or ensure your poster is included in the conference materials, your full submission must be received and your registration paid in full by February 14, 2025.

## WAYS TO SAVE

Group Discounts are Available! Special rates are available for multiple attendees from the same organization. For more information on group discounts contact Jeff Knight at [jknight@cambridgeenergetech.com](mailto:jknight@cambridgeenergetech.com) or 781-247-6264.

## PRICING & REGISTRATION INFORMATION

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<b>TUT1:</b> Na-ion Batteries: Materials and State of the Art	<b>TUT9:</b> Improving the Energy Density of Batteries with Silicon-Based Anodes
<b>TUT2:</b> Battery Safety & Abuse Tolerance Validation	<b>TUT10:</b> Li-ion Cell Design and Manufacturing
<b>TUT3:</b> Economics of Battery Material Development & Manufacturing	<b>TUT11:</b> Li-ion Battery Safety & Thermal Runaway
<b>TUT4:</b> In-Depth Analysis of the Chinese xEV Battery Industry	<b>TUT12:</b> Recycling Market & Methods
<b>TUT5:</b> Solid-State Batteries	<b>TUT13:</b> Latest Regulatory and Legislative Developments on the Safe Transport, Storage, Collection & Recycling of Lithium Batteries
<b>TUT6:</b> Technical Approaches to Li-ion Battery Recycling	<b>TUT14:</b> Virtual Analysis of Cell Aging and Cell Behaviors for the Selection and Development of Long-Life Cells
<b>TUT7:</b> Understanding the Future of Battery Cell Cost & Assessing the Economic Feasibility of Emerging Technologies	<b>TUT15:</b> Global EV Market Demand: In-Depth Insights, Future Projections & the Impact on the Battery Supply Chain
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<b>C2A:</b> High-Performance Battery Manufacturing	<b>C2B:</b> Battery Recycling
<b>C3A:</b> Global Supply Chain for Battery Raw Materials	<b>C5B:</b> Global Battery Manufacturing Production
<b>C4A:</b> Advances in Automotive Battery Applications	<b>C3B:</b> Battery Power for Consumer Electronics
<b>C5A:</b> Battery Safety	<b>C4B:</b> Grid-Scale Energy Storage
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## How to Register: [InternationalBatterySeminar.com](https://InternationalBatterySeminar.com)

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