

# **16th Annual Advanced Automotive Battery Conference (AABC 2016)**

Detroit, Michigan, USA  
14 - 17 June 2016

ISBN: 978-1-5108-2713-4

**Printed from e-media with permission by:**

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571



**Some format issues inherent in the e-media version may also appear in this print version.**

Copyright© (2016) by Advanced Automotive Batteries (AAB)  
All rights reserved.

Printed by Curran Associates, Inc. (2016)

For permission requests, please contact Advanced Automotive Batteries (AAB)  
at the address below.

Advanced Automotive Batteries (AAB)  
Part of Cambridge EnerTech  
250 First Ave, Suite 300  
Needham, MA 02494  
USA

Phone: (781) 972-5400  
Fax: (781) 972-5425

[info@advancedautobat.com](mailto:info@advancedautobat.com)

**Additional copies of this publication are available from:**

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571 USA  
Phone: 845-758-0400  
Fax: 845-758-2633  
Email: [curran@proceedings.com](mailto:curran@proceedings.com)  
Web: [www.proceedings.com](http://www.proceedings.com)



# Plenary

Part of Advanced Automotive Battery Conference

June 14 - 17, 2016 | Cobo Center | Detroit, MI

## WEDNESDAY, JUNE 15

12:00 pm Conference Registration Open

12:20 Networking Lunch

1:05 Dessert Break in the Exhibit Hall with Poster Viewing

### OPENING PLENARY SESSION: xEVs: VEHICLE AND BATTERY MARKET EXPANSION

2:00 Chairperson's Opening Remarks

*Menahem Anderman, Ph.D., President, Total Battery Consulting*

2:05 Vehicle Electrification: Challenges and Opportunities.....N/A

*Kevin Layden, Director, Electrified Powertrain Engineering, Ford Motor Company*

2:25 Electric Vehicles: Current Status and Future View of Nissan.....558

*Yasuharu Watanabe, General Manager, EV and HEV Battery Engineering Department, Nissan Motor Company*

2:45 Toyota's Electrification Roadmap.....N/A

*Michael Lord, Executive Engineer, Vehicle Regulation and Certification Engineering, Toyota Technical Center, Toyota Motor Engineering & Manufacturing NA*

3:05 Refreshment Break in the Exhibit Hall with Poster Viewing

4:00 xEV Expansion, Technology and Market Outlook.....1

*Menahem Anderman, Ph.D., President, Total Battery Consulting*

4:30 Analysis of xEV/LIB Market Trends and Findings from the Tear-down Program of xEV.....17

*Takeshi Miyamoto, Senior Vice President, B3 Corporation*

4:50 Advanced Technology Vehicle Comparisons.....25

*John German, Senior Fellow, ICCT*

5:10 Q&A

5:30 Networking Reception in the Exhibit Hall with Poster Viewing

Sponsored by  
**TOYOTA**

7:00 Close of Day



# Battery Chemistries for Automotive Applications

Part of Advanced Automotive Battery Conference

June 14 - 17, 2016 | Cobo Center | Detroit, MI

TUESDAY, JUNE 14

8:00 am Registration Open and Morning Coffee

## INTRODUCTION TO KEYNOTE & SYMPOSIUM OVERVIEW

9:00 Chairperson's Opening Remarks

*Martin Winter, Ph.D., Chair, Applied Material Science for Energy Conversion and Storage, MEET Battery, Research Center, Institute of Physical Chemistry, University of Muenster*

9:05 KEYNOTE PRESENTATION: Future Trends of Li-Ion Batteries.....N/A

*M. Stanley Whittingham, D.Phil., Distinguished Professor, Chemistry and Materials Science & Engineering, Binghamton University*

## CHALLENGES AND OPPORTUNITIES FOR LITHIUM-ION BATTERIES

Chairperson

*Venkat Srinivasan, Ph.D., Staff Scientist, Lawrence Berkeley National Lab*

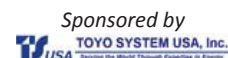
9:25 Development of Novel Electrolyte Additives for Designed Surface Modification.....41

*Brett L. Lucht, Ph.D., Professor of Chemistry, Department of Chemistry, University of Rhode Island*

9:45 Safe, Green and Low Cost Li-Ion Chemistry Enabled by Aqueous Interphase.....51

*Arthur Cresce, Ph.D., Materials Scientist, Electrochemistry Branch, U.S. Army Research Laboratory*

10:05 Grand Opening Coffee Break in the Exhibit Hall with Poster Viewing



11:30 A Closer Look at Silicon-Graphite (Si-Gr) Composite Electrodes During Cycling in NCM523/Si-Gr Full Cells.....N/A

*Daniel P. Abraham, Ph.D., Scientist, Argonne National Laboratory*

11:50 Tailoring Properties of Carbon Additives to Meet the Needs of Li-Ion Batteries.....60

*Miki Oljaca, Ph.D., Technology Manager, Battery R&D, Cabot Corporation*

12:10 pm Irreversible Capacities, Coulombic Efficiencies and Energy Efficiencies: Sorting out Promising and Less Promising Lithium-Ion Battery Materials.....72

*Martin Winter, Ph.D., Chair, Applied Material Science for Energy Conversion and Storage, MEET Battery, Research Center, Institute of Physical Chemistry, University of Muenster*

12:30 Q&A

12:50 Electrochemical Performance of Lac Knife High Purity Flake Graphite in the Anode and Cathode of Lithium Ion Batteries.....89

*Joseph E. Doninger, Ph.D., Director, Manufacturing and Technology, Focus Graphite Inc.*

Sponsored by



1:05 Networking Lunch

2:00 Dessert Break in the Exhibit Hall with Poster Viewing



# Battery Chemistries for Automotive Applications

Part of Advanced Automotive Battery Conference

June 14 - 17, 2016 | Cobo Center | Detroit, MI

**TUESDAY, JUNE 14**

## EMERGING FUTURE CHEMISTRIES (I): SOLID STATE BATTERY

---

- 3:00**      **Chairperson's Remarks**  
*Tim Arthur, Ph.D., Toyota Motor Engineering & Manufacturing North America*
- 3:05**      **Next-Generation Batteries based on Protected Lithium Metal Electrodes.....N/A**  
*Steven J. Visco, Ph.D., CEO, CTO, PolyPlus Battery Company*
- 3:25**      **Solid Electrolytes: An Enabling Technology for Vehicle Electrification.....103**  
*Travis Thompson, Ph.D., Research Fellow, University of Michigan*
- 3:45**      **Development of Solid Electrolyte for All-Solid-State Battery.....114**  
*Yuki Katoh, Ph.D., Battery AT, Advanced Technology Toyota Motor Europe NV/SA*
- 4:05**      **On the Importance of Scale-Up.....121**  
*Mohan Karulkar, Ph.D., Battery Research Engineer, Energy Storage Materials & Strategy, Ford Motor Company*
- 4:25**      **Q&A**
- 4:45**      **Networking Reception in the Exhibit Hall with Poster Viewing**
- 5:45**      **Close of Day**

Sponsored by  


**WEDNESDAY, JUNE 15**

**8:30 am**      **Morning Coffee**

## EMERGING FUTURE CHEMISTRIES (II): LI-METAL CHEMISTRIES

---

- 9:00**      **Chairperson's Remarks**  
*Steven J. Visco, Ph.D., CEO, CTO, PolyPlus Battery Company*
- 9:05**      **Status of Li-Metal Batteries for Vehicle Applications.....130**  
*Venkat Srinivasan, Ph.D., Staff Scientist, Lawrence Berkeley National Lab*
- 9:25**      **Drivers and Technologies for Li-Metal Solid-State Batteries.....138**  
*Juergen Gross, Ph.D., Senior Vice President Research, Bosch*
- 9:45**      **Li-Metal Battery - Application in Automotive.....146**  
*Mei Cai, Ph.D., Technical Fellow & Lab Group Manager, General Motors*
- 10:05**      **Coffee Break in the Exhibit Hall with Poster Viewing**
- 11:00**      **Design of Components for the Sustainable Li-S Batteries.....158**  
*Robert Dominko, Ph.D., Research Associate, National Institute of Chemistry, Slovenia Ljubljana University*



# Battery Chemistries for Automotive Applications

Part of Advanced Automotive Battery Conference

June 14 - 17, 2016 | Cobo Center | Detroit, MI

## WEDNESDAY, JUNE 15

- 11:20**      **Prospects of Lithium-Sulfur Batteries for Automotive Applications.....168**  
*Kevin G. Gallagher, Ph.D., Chemical Engineer, Argonne National Laboratory*
- 11:40**      **Challenges of the Electrode /Electrolyte Interphase in Lithium Metal Batteries.....178**  
*Mustafa Musameh, Ph.D., CSIRO Manufacturing*
- 12:00 pm**    **Q&A**
- 12:20**      **Networking Lunch**
- 1:05**      **Dessert Break in the Exhibit Hall with Poster Viewing**
- 2:00**      **Close of Symposium**



# Battery Engineering for Automotive Applications

Part of Advanced Automotive Battery Conference

June 14 - 17, 2016 | Cobo Center | Detroit, MI

## TUESDAY, JUNE 14

8:00 am Registration Open and Morning Coffee

### BATTERY PACK ENGINEERING

---

- 9:00 **Chairperson's Opening Remarks**  
*Oliver Gross, Technical Fellow – Energy Storage Systems, Fiat Chrysler Automobiles*
- 9:05 **How to Design a Battery Cell and a Battery Module with CAE Tools.....188**  
*Gaetan Damblanc, Technical Lead, CD Adapco*
- 9:25 **Battery Pack Thermal Design.....213**  
*Ahmad Pesaran, Ph.D., Energy-Storage Group Manager, National Renewable Energy Laboratory*
- 9:45 **Progress and Challenges Associated with Determining the State of Charge, Power, and Health of Battery Systems.....230**  
*Charles Wampler, Project Leader, Global Battery Systems Engineering, General Motors*
- 10:05 **Grand Opening Coffee Break in the Exhibit Hall with Poster Viewing**
- 11:30 **Comparing a Physics-Based to an Equivalent Circuit-Based Method for Battery SOC/SOH Determination.....242**  
*Gregory Plett, Ph.D., Professor, University of Colorado, Colorado Springs*
- 11:50 **An Open Systems Architecture Approach to BMS HIL Testing.....N/A**  
*Peter Blume, President and Founder, Bloomy*
- 12:10 pm **Novel SOC/SOH Sensor for Improving Li-Ion Life and Predictions.....250**  
*Joe Steiber, Principal Engineer, Energy Storage Technology Group, Engine, Emissions, and Vehicle Research Division, Southwest Research Institute*
- 12:30 **Q&A**
- 12:50 **Networking Lunch**
- 2:00 **Dessert Break in the Exhibit Hall with Poster Viewing**



### LITHIUM-ION CELL ENGINEERING

---

- 3:00 **Chairperson's Remarks**  
*Robert Spotnitz, Ph.D., President, Battery Design LLC*
- 3:05 **Rate-Limiting Steps in Porous Electrodes.....259**  
*Robert Spotnitz, Ph.D., President, Battery Design LLC*
- 3:25 **Atomic-Scale Modeling: A Path to Innovation in Batteries.....271**  
*Roman Tarnovsky, Global Marketing Director, Materials Design, Inc.*



# Battery Engineering for Automotive Applications

Part of Advanced Automotive Battery Conference

June 14 - 17, 2016 | Cobo Center | Detroit, MI

## TUESDAY, JUNE 14

- 3:45 From Packs to Pores: Characterizing Li-Ion Batteries in 2D, 3D, and 4D.....281**  
*Jeff Gelb, Senior Applications Development Engineer, Carl Zeiss X-Ray Microscopy*
- 4:05 Ceramic-Coated Separator, Li-Ion Safety and Performance.....N/A**  
*John Zhang, Ph.D., CTO, Celgard*
- 4:25 Q&A**
- 4:45 Networking Reception in the Exhibit Hall with Poster Viewing**
- 5:45 Close of Day**

Sponsored by  
Johnson Controls

## WEDNESDAY, JUNE 15

- 8:30 am Morning Coffee**

### BATTERY AND VEHICLE SAFETY AND ABUSE TOLERANCE

---

- 9:00 Chairperson's Remarks**  
*Ted Miller, Senior Manager of Energy Storage Strategy and Research, Ford Motor Company*
- 9:05 Virtually Proving a Battery is Safe.....300**  
*Ted Miller, Senior Manager of Energy Storage Strategy and Research, Ford Motor Company*
- 9:25 Safety Issues for Lithium-Ion Batteries: From Materials to Complete Cells.....311**  
*Margret Wohlfahrt-Mehrens, Ph.D., Senior Research Scientist & Project Leader, ZSW*
- 9:45 Diagnostic Tool Set Development to Determine Safety Stability and Health of an Isolated Li-Ion Battery Pack.....323**  
*Phil Gorney, Vehicle Safety Research Engineer, National Highway Traffic Safety Administration (NHTSA)*
- 10:05 Coffee Break in the Exhibit Hall with Poster Viewing**
- 11:00 Safety Modeling and Evaluation during Pack Development Process.....331**  
*Uwe Wiedemann, Ph.D., Senior Product Manager, Global Competence Team, AVL List GmbH*
- 11:20 Overcharge Battery Response.....340**  
*Al Masias, Research Engineer, Ford Motor Company*
- 11:40 Understanding Mechanical Abuse of Batteries.....N/A**  
*John Turner, Ph.D., Group Leader, Computational Engineering & Energy Sciences, Oak Ridge National Lab & UT-Battelle*
- 12:00 pm Q&A**
- 12:20 Networking Lunch**
- 1:05 Dessert Break in the Exhibit Hall with Poster Viewing**
- 2:00 Close of Symposium**





# xEV Battery Technology, Application and Market

Part of Advanced Automotive Battery Conference

June 14 - 17, 2016 | Cobo Center | Detroit, MI

THURSDAY, JUNE 16

- 9:00 Continental Breakfast Roundtable Discussions
- 10:00 Coffee Break in the Exhibit Hall with Poster Viewing

## BATTERIES FOR PHEVs AND EVs

---

- 11:00 **Chairperson's Opening Remarks**  
*William Wallace, Director, Global Battery Systems, General Motors Co.*
- 11:05 **Battery System for the Chevy Bolt.....348**  
*Greg Smith, Engineering Manager BEV Battery Packs, General Motors*
- 11:25 **Design and Integration of the Chrysler Minivan PHEV High Voltage Battery System.....357**  
*Steven Clark, Senior Manager Energy Storage & HV Systems, Fiat Chrysler Automobiles*
- 11:45 **Features of Outlander PHEV and Requirements of its Battery.....365**  
*Hiroyuki Sakai, EV/Powertrain System Engineering Department, Development Engineering Office, Mitsubishi Motors Corporation*
- 12:05 pm **xEV Battery System Trend Assessment.....377**  
*Kevin R. Konecky, Energy Storage Systems Consultant, Total Battery Consulting*
- 12:25 **Q&A**
- 12:40 **Networking Lunch**
- 1:30 **Dessert Break in the Exhibit Hall with Poster Viewing**

Sponsored by





# xEV Battery Technology, Application and Market

Part of Advanced Automotive Battery Conference

June 14 - 17, 2016 | Cobo Center | Detroit, MI

THURSDAY, JUNE 16

## ENERGY STORAGE FOR HYBRIDS

---

- 2:15**      **Chairperson's Remarks**  
*Monique Richard, Senior Principal Engineer Material Engineering Division, Toyota Motor Engineering & Manufacturing North America*
- 2:20**      **Battery Development for the New Prius.....391**  
*Koji Takahata, Toyota Motor Corporation*
- 2:40**      **Development of Battery System for the New NSX.....N/A**  
*Junji Uetake, Automobile R&D Center, Honda R&D Co., Ltd.*
- 3:00**      **48V, a Cost-Effective Approach to Reducing Real-World Diesel Passenger Car NOx and CO2 Emissions?.....404**  
*Lawrence Alger, Ph.D., Technical Manager, EV/HV Engineering, Denso Corporation*
- 3:20**      **Refreshment Break**
- 3:40**      **Lead Acid Solution for Low-Voltage Hybrid Vehicles.....414**  
*Jun Furakawa, Ph.D., Senior Fellow, Furakawa Battery Company*
- 4:00**      **Toshiba "SCiB™" with LTO Anode for Low-Voltage Hybrid Systems.....426**  
*Koji Ishiwa, Senior Manager, Automotive Systems Division, Toshiba Corporation*
- 4:20**      **Safety Requirements for Low-Voltage Systems.....440**  
*Jeff Kessen, Vice President, Corporate Strategy, A123 Systems*
- 4:40**      **Q&A**
- 5:00**      **Close of Day**



# xEV Battery Technology, Application and Market

Part of Advanced Automotive Battery Conference

June 14 - 17, 2016 | Cobo Center | Detroit, MI

## FRIDAY, JUNE 17

8:30 am Morning Coffee

### xEV BATTERY RELIABILITY AND DURABILITY

---

9:00 Chairperson's Remarks

*Bob Taenaka, Technical Leader, Advanced Battery Systems, Ford Motor Company*

9:05 Predicting and Validating Battery Life in xEV Applications.....449

*Bob Taenaka, Technical Leader, Advanced Battery Systems, Ford Motor Company*

9:25 Battery System Design Considerations behind the Chevrolet Volt EREV and the Bolt BEV.....455

*JT Guerin, Engineering Specialist, General Motors*

9:45 Development of Robust Real-World Usage Cases for Electric Vehicles.....463

*Paul Haney, Manager Advanced Energy Storage, Low Carbon Vehicles Research, Jaguar Land Rover Ltd.*

10:05 Coffee Break

10:30 New Material Development for Enhanced Life of High Energy Lithium-Ion Batteries for xEV.....N/A

*Jong Hun Kim, Ph.D., Research Fellow & Team Leader, PHEV/EV Cell Development, LG Chem*

10:50 Optimizing Battery Usage and Management for Long Life.....476

*Kandler Smith, Ph.D., Senior Researcher, Energy-Storage Group, National Renewable Energy Laboratory*

11:10 Calendar Life Performance of Hitachi Power Cell.....489

*Kenji Nakai, Group Leader, LIB Cell Development Department, Hitachi Automotive Systems*

11:30 Q&A

11:50 Networking Lunch

Sponsored by



### BATTERY CHARGING TECHNOLOGY AND SECONDARY USAGE

---

1:20 pm Chairperson's Remarks

*Christian Jung, Ph.D., Development Engineer, Porsche AG*

1:25 EVs and PHEVs Charging Habits.....503

*James Francfort, Program Manager, Energy Storage and Transportation Systems, Idaho National Laboratory*

1:45 The Future of EVs and Fast Charging at 800V.....N/A

*Christian Jung, Ph.D., Development Engineer, Porsche AG*

2:05 Secondary Use EV/PHEV Batteries for Grid Markets.....517

*Ben Ollis, R&D Staff, Oak Ridge National Laboratory*

2:25 Q&A

2:40 Refreshment Break



# xEV Battery Technology, Application and Market

Part of Advanced Automotive Battery Conference

June 14 - 17, 2016 | Cobo Center | Detroit, MI

FRIDAY, JUNE 17

## CLOSING PLENARY SESSION: xEV INFRASTRUCTURE

- 2:55**      **Chairperson's Remarks**  
*Mark Duvall, Director, Electric Transportation and Energy Storage, Electric Power Research Institute*
- 3:00**      **Status of FCEVs and H2 Infrastructure in California - The Challenges Met and What's Next.....530**  
*Bill Elrick, Executive Director, California Fuel Cell Partnership*
- 3:20**      **Charging Infrastructure Progress and Challenges.....536**  
*Mark Duvall, Director, Electric Transportation and Energy Storage, Electric Power Research Institute*
- 3:40**      **Charging Infrastructure – Southern California Edison Experience.....546**  
*Jordan W. Smith, Engineering Manager Advanced Technology, Southern California Edison*
- 4:00**      **Q&A**
- 4:20**      **Closing Remarks**
- 4:30**      **Close of Conference**



# Fuel Cell Technology and Applications

Part of Advanced Automotive Battery Conference

June 14 - 17, 2016 | Cobo Center | Detroit, MI

## THURSDAY, JUNE 16

9:00 Continental Breakfast Roundtable Discussions

10:00 Coffee Break in the Exhibit Hall with Poster Viewing

11:00 Chairperson's Opening Remarks

*Alan Lloyd, Ph.D., President Emeritus, International Council on Clean Transportation; Senior Research Fellow, Energy Institute, University of Texas at Austin*

11:05 **OPENING KEYNOTE PANEL DISCUSSION: Overcoming the Barriers to Achieving Low Cost, High Durability and Performance for Automotive Applications.....N/A**

*Moderator: Robert Bienenfeld, Assistant Vice President, Environment and Energy Strategy, American Honda Motor Co., Inc.*

*Panelists: Bill Elrick, Executive Director, California Fuel Cell Partnership*

*Shane Stephens, Ph.D., Chief Development Officer and Principal, FirstElement Fuel, Inc.*

11:45 **FC-PAD Consortium for Performance and Durability.....570**

*Rod Borup, Ph.D., Program Manager, Fuel Cells, Los Alamos National Laboratory*

12:05 pm **Membrane Electrode Assemblies for High-Temperature PEM Fuel Cells.....582**

*Hans Aage Hjuler, Ph.D., Managing Director and CEO, Danish Power Systems*

12:25 Q&A

12:40 Networking Lunch

Sponsored by



1:30 Dessert Break in the Exhibit Hall with Poster Viewing

## ADVANCED MATERIALS, COMPONENTS & SYSTEMS

2:15 Chairperson's Remarks

*James Fenton, Ph.D., Director, Florida Solar Energy Center; Professor, Mechanical, Materials and Aerospace Engineering, University of Central Florida*

2:20 **Prospects of Non-Noble Metal Catalysts for Fuel Cells.....N/A**

*Sanjeev Mukerjee, Ph.D., Professor of Chemistry and Chemical Biology; Director, Northeastern University Center for Renewable Energy Technology, Northeastern University*

2:40 **Manufacturing Considerations for Fuel Cell Components: Impact of Manufacturing on Gas Diffusion Layers Properties....600**

*François Girard, Ph.D., Thrust Leader – Fuel Cell Manufacturing, Vehicle Propulsion Technologies Program, National Research Council Canada/Government of Canada*

3:00 **Advances in MEA Development: Automotive Application, Low PGM, Durability, Materials by Design Approach.....610**

*Madeleine Odgaard, CEO, IRD Fuel Cells, LLC, Denmark*

3:20 Refreshment Break



# Fuel Cell Technology and Applications

Part of Advanced Automotive Battery Conference

June 14 - 17, 2016 | Cobo Center | Detroit, MI

## THURSDAY, JUNE 16

- 3:40 Technology Development for Corrosion Resistant Metal Bipolar Plates for PEM Fuel Cell Stacks.....626**  
*Conghua Wang, Ph.D., Vice President and CTO, Treadstone Technologies*
- 4:10 Fuel Cell Vehicles: Can We Avoid Another Hype Cycle?.....635**  
*Alan Lloyd, Ph.D., President Emeritus, International Council on Clean Transportation; Senior Research Fellow, Energy Institute, University of Texas at Austin*
- 4:40 Q&A**
- 5:00 Close of Day**

## FRIDAY, JUNE 17

- 8:30 am Morning Coffee**

### NEW VEHICLE DEVELOPMENT: ACHIEVING LOW COST, HIGH DURABILITY & PERFORMANCE

---

- 9:00 Chairperson's Remarks**  
*Sanjeev Mukerjee, Ph.D., Professor of Chemistry and Chemical Biology, Director Northeastern University Center for Renewable Energy Technology, Northeastern University*
- 9:05 KEYNOTE PRESENTATION: Enabling Sustainable Mobility – The Toyota Mirai.....N/A**  
*Justin Ward, General Manager, Powertrain System Control Department, Toyota Technical Center, Toyota Motor Engineering & Manufacturing, North America, Inc.*
- 9:25 Fuel Cells and Hydrogen Status and Recent Progress under the U.S. Department of Energy Fuel Cell and Hydrogen Program.....N/A**  
*John Kopasz, Ph.D, Chemist, Argonne National Laboratory*
- 9:45 Remaining Technical Challenges in R&D for Automotive Fuel Cell Systems - Diagnostic Analysis and Simulation.....647**  
*Shinichi Hirano, Principal Research Engineer, Fuel Cell Research, Ford Motor Company*
- 10:05 Coffee Break**

### INNOVATIONS IN FUELS, DISTRIBUTION AND INFRASTRUCTURE

---

- 10:30 Analysis of the Current and Future Technologies for the Hydrogen Refueling Stations From Manufacturing Competitiveness and Supply Chain Perspectives.....656**  
*Ahmad Mayyas, Ph.D., Research Scientist, Strategic Energy Analysis Center, NREL*
- 10:50 Update on Fuel Cell Bus Technology and Infrastructure.....678**  
*Steve Sokolsky, Program Director, CALSTART*
- 11:10 Development of California's Retail Hydrogen Network.....N/A**  
*Shane Stephens, Ph.D., Chief Development Officer and Principal, FirstElement Fuel Inc.*
- 11:30 Q&A**



# Fuel Cell Technology and Applications

Part of Advanced Automotive Battery Conference

June 14 - 17, 2016 | Cobo Center | Detroit, MI

FRIDAY, JUNE 17

11:50      **Networking Lunch**

Sponsored by



## APPLICATIONS IN FUEL CELL & BATTERY HYBRIDIZATION

- 1:20 pm      Chairperson's Remarks**  
*Rod Borup, Ph.D., Program Manager, Fuel Cells, Los Alamos National Laboratory*
- 1:25            How Hydrogen Fuel Cell Electric Vehicles Are Addressing Transportation Challenges Today.....687**  
*Jennifer Kurtz, Hydrogen and Fuel Cell Systems Engineering Group Manager, National Renewable Energy Laboratory*
- 1:45            Development and Demonstration of Fuel Cell-Powered Transport Refrigeration Units for Refrigerated Trucks.....701**  
*Kriston Brooks, Chief Engineer, Pacific Northwest National Laboratory*
- 2:05            Battery and Fuel Cell EVs, PV and Your Home.....712**  
*James Fenton, Ph.D., Director, Florida Solar Energy Center, Professor, Mechanical, Materials and Aerospace Engineering, University of Central Florida*
- 2:25            Q&A**
- 2:40            Refreshment Break**

## CLOSING PLENARY SESSION: xEV INFRASTRUCTURE

- 2:55            Chairperson's Remarks**  
*Mark Duvall, Director, Electric Transportation and Energy Storage, Electric Power Research Institute*
- 3:00            Status of FCEVs and H2 Infrastructure in California - The Challenges Met and What's Next.....N/A**  
*Bill Elrick, Executive Director, California Fuel Cell Partnership*
- 3:20            Charging Infrastructure Progress and Challenges.....N/A**  
*Mark Duvall, Director, Electric Transportation and Energy Storage, Electric Power Research Institute*
- 3:40            Charging Infrastructure – Southern California Edison Experience.....N/A**  
*Jordan W. Smith, Engineering Manager Advanced Technology, Southern California Edison*
- 4:00            Q&A**
- 4:20            Closing Remarks**
- 4:30            Close of Conference**



# Lead-Based Technology and Applications

Part of Advanced Automotive Battery Conference

June 14 - 17, 2016 | Cobo Center | Detroit, MI

## THURSDAY, JUNE 16

- 9:00 Continental Breakfast Roundtable Discussions**
- 10:00 Coffee Break in the Exhibit Hall with Poster Viewing**
- 11:00 Chairperson's Opening Remarks**  
*Allan Cooper, European Project Coordinator, Advanced Lead-Acid Battery Consortium (ALABC)*
- 11:05 Advanced Lead Batteries - The Sustainable Choice for Automotive Applications.....N/A**  
*Alistair Davidson, Ph.D., Technical Manager, International Lead Association*
- 11:25 Recent Advancements in Automotive Lead Batteries and the ALABC Program for Further Increasing of Lead Battery Performance.....N/A**  
*Boris Monahov, Ph.D., Program Manager, Advanced Lead-Acid Battery Consortium (ALABC) – a program of the International Lead Association (ILA)*
- 11:45 Demonstrating Advanced Lead Carbon Batteries in 48V Vehicles.....726**  
*Allan Cooper, European Project Coordinator, Advanced Lead-Acid Battery Consortium (ALABC)*
- 12:05 pm Surface Modifications of Carbon Materials for the Fabrication of Lead-Carbon OHMIC Contacts.....741**  
*Yi-Ren Tzeng, Ph.D., Associate Engineer, Institute of Nuclear Energy Research*
- 12:25 pm Q&A**
- 12:40 Networking Lunch**
- 1:30 Dessert Break in the Exhibit Hall with Poster Viewing**

Sponsored by



## ADVANCED MATERIALS FOR NEXT-GEN LEAD BATTERIES

---

- 2:15 Chairperson's Remarks**  
*Boris Monahov, Ph.D., Program Manager, Advanced Lead-Acid Battery Consortium (ALABC) – a program of the International Lead Zinc Research Organization (ILZRO)*
- 2:20 Performance Advances in Flooded Type ISS Battery.....751**  
*Takayuki Kimura, Energy Devices and Materials Development Center, Tsukuba Chemical Laboratory, Hitachi Chemical Co., Ltd.*
- 2:40 Carbon Additives in Advanced Lead-Acid Batteries.....765**  
*Aurelien DuPasquier, Ph.D., Senior Scientist, Cabot Corporation*
- 3:00 A Geometrically Optimized VRLA Battery for Power and Thermal Management in HEV Applications.....781**  
*George Brilmyer, Ph.D., Partner, HighWater Innovations, LLC*
- 3:20 Refreshment Break**





# Lead-Based Technology and Applications

Part of Advanced Automotive Battery Conference

June 14 - 17, 2016 | Cobo Center | Detroit, MI

## THURSDAY, JUNE 16

- 3:40**      **Highly-Refined Secondary Lead for Critical Applications.....803**  
*Timothy W. Ellis, Ph.D., President, RSR Technologies, Inc.*
- 4:00**      **Lead's Second Life: Advancements in Sustainable Storage.....810**  
*Daniel Moomaw, Mechanical Engineer, Gridtential Energy, Inc.*
- 4:20**      **Increased Service Life and Power Output of Lead Batteries as a Result of Active Mass Optimization by Leit Modulation During Plate Production and Operation.....822**  
*Boris Shirov, Project Manager, Research and Development, TASC, Ltd.*
- 4:40**      **Q&A**
- 5:00**      **Close of Day**

## FRIDAY, JUNE 17

- 8:30 am**      **Morning Coffee**

### ADVANCED LEAD BATTERIES IN START-STOP AND MILD HYBRID ELECTRIC VEHICLES

---

- 9:00**      **Chairperson's Remarks**  
*Andy Bush, Ph.D, Managing Director, International Lead Association*
- 9:05**      **Next-Generation EFB and AGM Technology to Support Growing Start-Stop Demand.....829**  
*Tom Watson, Vice President & Technical Fellow, Powertrain & Vehicle Systems, Johnson Controls*
- 9:25**      **Novel Negative Electrode for High DCA Performance.....836**  
*Stuart McKenzie, CEO, ArcActive, Ltd.*
- 9:45**      **Advanced Lead-Acid Batteries for Micro and Mild Hybrid Systems.....856**  
*Perry Kramer, Research Scientist, East Penn Manufacturing*
- 10:05**      **Coffee Break**
- 10:30**      **Dynamic Charge Acceptance in High Carbon Lead-Acid Cells: Variation with Environmental Conditions and Test Parameters.....872**  
*Matthew Smith, Post Graduate Researcher, Department of Electronic and Electrical Engineering, University of Sheffield, UK*
- 10:50**      **Performance Testing of Various Advanced Lead-Acid Battery Products using USABC Battery Test Manual For 12V Start/Stop Vehicles.....N/A**  
*Donald Karner, President, Battery Test & Development, Electric Applications Incorporated*
- 11:10**      **Bipolar Lead-Acid Battery Significantly Reduces Weight and Advances Performance for Automotive Applications.....884**  
*Edward Shaffer, Ph.D, CEO, Advanced Battery Concepts*
- 11:30**      **Q&A**
- 11:50**      **Networking Lunch**

Sponsored by





# Lead-Based Technology and Applications

Part of Advanced Automotive Battery Conference

June 14 - 17, 2016 | Cobo Center | Detroit, MI

FRIDAY, JUNE 17

## NEXT-GEN LEAD APPLICATIONS

- 1:20 pm**     **Chairperson's Remarks**  
*Robert Flicker, COO, East Penn Manufacturing*
- 1:25**        **Thin-Plate Pure Lead AGM Batteries for Heavy Duty Truck Applications.....892**  
*Jerry Hoffman, President, Northstar Battery*
- 1:45**        **PANEL DISCUSSION: Next-Gen Lead-Based Batteries and the Global Marketplace.....904**  
*Moderator: Boris Monahov, Ph.D., Program Manager, Advanced Lead-Acid Battery Consortium (ALABC) – a program of the International Lead Association (ILA)*  
*Panelists: Robert Flicker, COO, East Penn Manufacturing; Rob Privette, Vice President, Energy Markets, XG Sciences*
- 2:25**        **Q&A**
- 2:40**        **Refreshment Break**

## CLOSING PLENARY SESSION: xEV INFRASTRUCTURE

- 2:55**        **Chairperson's Remarks**  
*Mark Duvall, Director, Electric Transportation and Energy Storage, Electric Power Research Institute*
- 3:00**        **Status of FCEVs and H2 Infrastructure in California - The Challenges Met and What's Next.....N/A**  
*Bill Elrick, Executive Director, California Fuel Cell Partnership*
- 3:20**        **Charging Infrastructure Progress and Challenges.....N/A**  
*Mark Duvall, Director, Electric Transportation and Energy Storage, Electric Power Research Institute*
- 3:40**        **Charging Infrastructure – Southern California Edison Experience.....N/A**  
*Jordan W. Smith, Engineering Manager Advanced Technology, Southern California Edison*
- 4:00**        **Q&A**
- 4:20**        **Closing Remarks**
- 4:30**        **Close of Conference**