

# **Automotive Partnering Summit 2018**

Held at AABC 2018

San Diego, California, USA  
4 - 7 June 2018

ISBN: 978-1-5108-6735-2

**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© (2018) by Cambridge EnerTech  
All rights reserved.

Printed by Curran Associates, Inc. (2018)

For permission requests, please contact Cambridge EnerTech  
at the address below.

Cambridge EnerTech  
Cambridge Innovation institute  
250 First Avenue  
Suite 300  
Needham, MA 02494  
USA

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

[ce@cambridgeenertech.com](mailto:ce@cambridgeenertech.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)

# TABLE OF CONTENTS

## PRESENTATIONS

<b>What Happens When EVs are Everywhere?.....</b>	1
<i>Jason Applebaum</i>	
<b>Civil Maps Cognition for Cars - Scalable Mapping &amp; Localization with Fingerprint Technology .....</b>	7
<i>Paul Drysch</i>	
<b>Navigating the Landscape of Structuring Partnership Agreements for Early Stage Companies .....</b>	14
<i>David S. Jacoby</i>	
<b>South 8 Technologies - Next Generation Energy Storage Devices.....</b>	21
<i>Jungwoo Lee</i>	
<b>Wireless Charging: Integrating Electric Vehicle Autonomy, Renewables, and Battery Storage.....</b>	28
<i>Jeremy McCool</i>	
<b>5-minute Fast Charge Batteries for Higher EV Adoption.....</b>	33
<i>Robert A. Rango</i>	
<b>Ionic Materials Company Presentation .....</b>	38
<i>Erik Terjesen</i>	

## POSTERS

<b>Development of High Voltage Li[1.0]Ni[0.5]Mn[1.5]O[4] .....</b>	44
<i>Lars Fahl Lundsgaard, Jakob Weiland Høj, Kristoffer Visti Graae, Jacob Kaestel-Hansen, Christian Fink Elkjaer, Rainer Küngas, Jon Fold von Bulow, Line Holten Kollin, Søren Dahl, Jonathan Højberg</i>	
<b>Improved Battery Performance and Reliability Through Multiple and Rugged Spectroscopic Materials Characterization .....</b>	45
<i>Matthieu Chausseau</i>	
<b>Re-Energizing the Silicon Anode: A New Approach to the Highest Energy Li-Ion System.....</b>	46
<i>Ed Williams, Daniela Molina Piper, Tyler Evans</i>	
<b>Online Estimation of Lithium-Ion Battery Capacity Using Deep Convolutional Neural Networks .....</b>	47
<i>Sheng Shen, Mohammad Kazem Sadoughi, Xiangyi Chen, Mingyi Hong, Gaurav Jain, Hui Ye, Chao Hu</i>	
<b>A Case Study on the Fire of Battery Module (Case Analysis).....</b>	48
<i>Jaegeun Oh, Hyunwon Lee</i>	
<b>Technologies and Materials to Enable Advanced Anode and Cathode Materials.....</b>	49
<i>K.B. Fitch, M.V. Yakovleva, Jian Xia</i>	
<b>In-Operando Optical Microscopy and Vertex Delay Cyclic Voltammetry for Direct Observation of Lithium Dendrite Regimes .....</b>	51
<i>Joonho Koh, Sardar Saydul, Jing Xu, Damiao Kang, John P. Lemmon, Noam Hart</i>	
<b>Solid-State Polymer Electrolytes with a Poly(Ethylene Glycol) Epoxy Resin Polymer Host.....</b>	52
<i>Gerrick E. Lindberg, Constantin Ciocan, Cindy C. Browder</i>	
<b>Liquefied Gas Electrolytes for Lithium Batteries .....</b>	53
<i>Cyrus Rustomji</i>	
<b>Patents on Electrochemical Energy Storage.....</b>	54
<i>Arumugam Manthiram, Milda Vilkaityte Saenz</i>	
<b>Electrolyte Development for Silicon-Based Anode Through High Throughput Screening.....</b>	55
<i>Jinhua Huang, Ye Zhu, Cameron Peebles, Gang Cheng, Mark Gresser</i>	
<b>Conversion Mechanism of CuF<sub>2</sub> for Secondary Batteries .....</b>	56
<i>Kyler Carroll, Chuze Ma, Ana Kiricova, Bin Li</i>	
<b>Ex Situ Treatment of Lithium Metal Anodes to Enable Long-Term Cycling with Carbonate-Based Electrolytes.....</b>	58
<i>Cameron Peebles, Jinhua Huang, Ye Zhu, Gang Cheng, Dee Strand</i>	
<b>Accelerating Silicon Anode Development .....</b>	59
<i>Kyler J. Carroll, Johnny Yang, Dee Strand, Bin Li, Tanghong Yi</i>	
<b>Importance of Reliable Circuit Protection as a Safety Measure in Automotive Applications.....</b>	60
<i>Mike Roach, Liwu Wang</i>	
<b>Understanding Degradation of Lithium-Ion Battery Performance.....</b>	61
<i>Richard Rucker, Josh Godshaw, Joel Forman, Keith Beers, Kevin White, Timothy Bogart</i>	

<b>Validating Material Purity Using X-Ray Technology to Safeguard Against Catastrophic LiB Failure.....</b>	62
<i>Masataka Ohgaki, Yuta Seki, Greg Rigby, Matt Kreiner, Brian Goolsby, Keiichiro Shinohara</i>	
<b>Economic Implications of Lithium Ion Battery Degradation for Vehicle-To-Grid (V2X) Services.....</b>	63
<i>Andrew W. Thompson</i>	
<b>Spatial Distribution of Heat Generation in a Lithium Ion Battery Pouch Cell .....</b>	64
<i>Takkyung Yoo, Heon-jun Jeong, Jeseung Moon, Kyu-Jin Lee</i>	
<b>State-of-Health Based Load Sharing Strategy in Vehicle-to-Grid Systems .....</b>	65
<i>Hussam Khasawneh, Mahesh Illindala, Longya Xu</i>	
<b>A Life Model of Lithium-Ion Battery Considering Electrolyte Dry-Out .....</b>	66
<i>Seong-taeck Ryu, Hong-Keun Kim, Jeseung Moon, Kyu-Jin Lee, Hong-Keun Kim</i>	
<b>Effects of Thermal Imbalance in LIB Pack Systems on Capacity Fade Studied by a Multi-Physics Model.....</b>	67
<i>Hong-Keun Kim, Kyu-Jin Lee, Soonkyu Lee</i>	
<b>Atomic Layer Deposition: A Scalable Process for Enabling the Next Generation of High Performance Materials.....</b>	68
<i>Barbara Hughes, James Trevey</i>	
<b>Potential in Synergy of Automotive and Aviation Battery Development .....</b>	69
<i>Christof Bussen, Jan Wohlmuther, Robert Stanek, Sebastian Menne, Nina Koertzinger, Martin Talke</i>	
<b>Online-Simulation and Its Parameter Estimation for E-Vehicle Batteries and Their Dependence on Temperature, C-Rate and SOC .....</b>	71
<i>Volker Schulz, Arnulf Latz, Magdalena Gottfried</i>	
<b>Dual-Chemistry Energy Storage Design and Control Software for Next Generation xEVs.....</b>	72
<i>Thomas Couture, Akhilesh Bakshi, Thomas Ortmeyer, Nicolo Brambilla, Fabrizio Martini</i>	
<b>Battery-Lifetime Extension for Low-Cost EVs Using Combined Battery System .....</b>	73
<i>Takeshi Inoue, Shin Yamauchi, Rishi Chandra, Shigeki Makino, Daiki Komatsu</i>	
<b>Analysis of Thermal Behavior and Improvement of Performance of Lithium-Ion Battery by Tab-Heating at Low Temperature .....</b>	74
<i>Kyu-Jin Lee, Heon-jun Jeong</i>	
<b>Structural Material with Intrinsic Power Storage Capability for Use in Hybrid Electrochemical Systems .....</b>	75
<i>Gerrick E. Lindberg, Cindy C. Browder, Constantin Ciocanel</i>	
<b>Author Index</b>	