

# 5<sup>th</sup> Symposium on Scalable Energy Storage: Beyond Lithium Ion

## Meeting Agenda

The Claremont Hotel, Berkeley, California

Empire Ballroom

<b>Day 1 - Tuesday, June 5<sup>th</sup> 2012</b>		
7:30 a.m. - 8:20 a.m.	<i>Badging (Lobby) / Continental Breakfast (Empire Ballroom Hallway)</i>	
<b>Time</b>	<b>Speaker</b>	<b>Subject</b>
8:20 a.m. - 8:40 a.m.	Symposium Chairs, Dr. Anne Dillon <i>National Renewable Energy Laboratory</i> Dr. Venkat Srinivasan <i>Lawrence Berkeley National Laboratory</i>	Welcome & Introductions
8:40 a.m. - 9:20 a.m.	Prof. Paul Alivisatos <i>Lawrence Berkeley National Laboratory</i>	Carbon Cycle 2.0
9:20 a.m. - 9:50 a.m.	AM BREAK (Claremont Ballroom)	
9:20 a.m. - 9:50 a.m.	Electric Vehicle Exhibit Electric Vehicles will be exhibited directly outside the Main Lobby, next to the valet station	
<b>Session 1: General Session on Battery Powered Vehicles and Implications on the Grid</b> <b>Chair: Winfried Wilcke</b>		
<b>Time</b>	<b>Speaker</b>	<b>Subject</b>
9:50 a.m. - 10:30 a.m.	Dr. Haruyoshi Kumura <i>Nissan</i>	Expand EV's Value - Mobility and Beyond
10:30 a.m. - 11:10 a.m.	Mr. Thomas Greszler <i>General Motors</i>	Li-Air and Li-Sulfur Technology in an Automotive System Context
11:10 a.m. - 11:50 a.m.	Prof. Stan Whittingham <i>SUNY Binghamton</i>	Beyond Lithium Ion: A Reality Check
11:50 a.m. - 1:00 p.m.	LUNCH (Claremont Ballroom)	
12:30 p.m. - 1:00 p.m. (Claremont Ballroom)	Dr. Karim Zaghib <i>Hydro-Québec</i>	Lithium Metal for Rechargeable Polymer and Metal-Air Batteries: Challenges and Opportunities
<b>Session 2: Li-metal</b> <b>Chair: Gao Liu</b>		
<b>Time/Location</b>	<b>Speaker</b>	<b>Subject</b>
1:00 p.m. - 1:20 p.m.)	Dr. Jake Christensen <i>Robert Bosch, LLC</i>	Requirements for Li-protection in Li/air Cells
1:20 p.m. - 2:00 p.m.	Prof. Stefano Passerini <i>University of Münster, Germany</i>	Ionic Liquid-based Electrolytes for Next Generation Batteries
2:00 p.m. - 2:40 p.m.	Dr. Jordi Cabana <i>Lawrence Berkeley National Laboratory</i>	Protective Layers for the Lithium Electrode based on Ceramic Phases
2:40 p.m. - 3:20 p.m.	Dr. Nancy J. Dudney <i>Oak Ridge National Laboratory</i>	Transport and Mechanical Properties of Pure and Composite Solid Lithium-ion Electrolytes.
3:20 p.m - 3:40 p.m.	PM BREAK (Claremont Ballroom)	

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### Day 1 - Tuesday, June 5<sup>th</sup> 2012 (continued)

#### Session 3: Li/air Experiments

Chair: Winfried Wilcke

Time	Speaker	Subject
3:40 p.m. - 4:20 p.m.	Dr. Rouven Scheffler Dr. Angela Speidel <i>Volkswagen Research</i>	Progress in Research on Lithium Oxygen Batteries
4:20 p.m. - 5:00 p.m.	Dr. Nenad Markovic <i>Argonne National Laboratory</i>	Complexity (Simplicity) of Li/air Interfaces
5:00 p.m - 5:40 p.m.	Dr. Dong Joon Lee <i>Samsung SAIT</i>	A Nonaqueous Li-air Battery with Protected Anode: Perspectives on Improving Life Cycle
6:00 p.m – 9:00 p.m.	Optional shuttle transportation will be provided to a choice of restaurants in Downtown Berkeley. Shuttle will leave at approximately 6:15 p.m. from directly outside the Main Lobby. Return shuttle service will be provided until 9:00 p.m. Please see list of restaurant choices, map, and transportation contacts provided at the conference information/registration desk.	

### Day 2 - Wednesday, June 6<sup>th</sup> 2012

#### Session 3: Li/air Experiments (continued)

Chair: Winfried Wilcke

Time	Speaker	Subject
8:30 a.m. - 9:10 a.m.	Prof. Khalil Amine <i>Argonne National Laboratory</i>	Beyond Lithium-ion Batteries
9:10 a.m. - 9:50 a.m.	Prof. Nobuyuki Imanishi <i>Mie University, Japan</i>	Air Electrodes for Lithium-Air Batteries with Weak Alkaline Aqueous Electrolyte
9:50 a.m. - 10:10 a.m.	AM BREAK (Claremont Ballroom)	

#### Session 4: Li/air Theory

Chair: Donald Siegel

Time	Speaker	Affiliation	Subject
10:10 a.m. - 10:50 a.m.	Prof. Jens Nørskov <i>Stanford University</i>		Surface Electrochemistry and Electron Transport in the Oxygen Electrode of an Aprotic Li-air Battery
10:50 a.m. - 11:30 a.m.	Dr. Shuye Ping Ong <i>MIT</i>		First-principles Study of the Oxygen Evolution Reaction and Polaronic Hole Transport in the Lithium-air Battery.
11:30 a.m. - 12:10 p.m.	Dr. Suhuai Wei <i>National Renewable Energy Laboratory</i>		First-Principles Study of Low Electron Conductivity in Li Peroxide for Li-air Batteries
12:10 p.m. - 1:20 p.m.	LUNCH (Claremont Ballroom)		
12:40 p.m. - 1:10 p.m. (Claremont Ballroom)	Dr. Aleksandar Kojic <i>Robert Bosch, LLC</i>		Overview of Energy-Related Research at the Bosch Research and Technology Center

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### Day 2 - Wednesday, June 6<sup>th</sup> 2012 (continued)

#### Session 5: Alternative Chemistries

Chair: Venkat Srinivasan

Time	Speaker	Subject
1:20 p.m. - 2:00 p.m.	Prof. John Newman <i>University of California, Berkeley</i>	Renewable Fuels
2:00 p.m. - 2:40 p.m.	Prof. Robert Huggins <i>Stanford University</i>	A New Class of Aqueous Insertion Reaction Electrodes with Rapid Kinetics and Long Life Cycle
2:40 p.m. - 3:20 p.m.	Prof. Jay Whitacre <i>Carnegie Mellon University</i>	Aqueous Electrolyte Polyionic Electrochemical Cells for Scaled Stationary Energy Storage
3:20 p.m. - 4:00 p.m.	Dr. Jun Liu <i>Pacific Northwest National Laboratory</i>	New Nanostructured Electrodes for Li-ion and Li-S batteries with Long Cycle Life
4:00 p.m - 4:30 p.m.	BREAK before Poster Session	
4:30 p.m. - 8:00 p.m. (Lanai & Horizon Rooms)	POSTER SESSION & RECEPTION (includes heavy appetizers) Held in the Lanai & Horizon Reception Rooms	

### Day 3 - Thursday, June 7<sup>th</sup> 2012

#### Session 6: Oxygen Supply to Metal/air Batteries

Chair: Alan Luntz

Time/Location	Speaker	Subject
8:30 a.m. - 8:50 am	Dr. Paul Albertus <i>Robert Bosch, LLC</i>	Overview of the Gas Handling Requirements for a Li/O <sub>2</sub> Battery
8:50 a.m. - 9:30 am	Dr. Bryan McCloskey <i>IBM Research</i>	Atmospheric Contamination in Non-aqueous Li-air Batteries: Implications from a Membrane Separation Perspective
9:30 a.m. - 10:10 a.m.	Dr. Søren Dahl <i>Haldor Topsoe</i>	Air cleaning – Perspectives from Catalytic Processes
10:10 a.m. - 10:30 a.m.	AM BREAK (Claremont Ballroom)	

#### Session 7: Li-S Batteries

Chair: Paul Albertus

Time/Location	Speaker	Subject
10:30 a.m. - 11:10 a.m.	Prof. Yi Cui <i>Stanford University</i>	Nanostructure Design for High Energy Batteries
11:10 a.m. - 11:50 a.m.	Prof. Arumugam Manthiram <i>University of Texas, Austin</i>	High Energy, High Power Rechargeable Lithium-Sulfur Batteries for Scalable Electrochemical Energy Storage Systems
11:50 a.m. - 1:00 p.m.	LUNCH (Claremont Ballroom)	

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Day 3 - Thursday, June 7 <sup>th</sup> 2012 (continued)		
12:30 p.m. – 1:00 p.m. (Claremont Ballroom)	Dr. Venkat Srinivasan <i>Lawrence Berkeley National Laboratory</i>	Discussion and plans 2013 Symposium
<b>Session 7: Li-S Batteries (continued)</b> <b>Chair: Paul Albertus</b>		
<b>Time/Location</b>	<b>Speaker</b>	<b>Subject</b>
1:00 p.m. – 1:40 p.m.	Prof. Elton Cairns <i>Lawrence Berkeley National Laboratory</i>	Beyond Lithium Ion: The Lithium/Sulfur Cell
1:40 p.m. - 2:20 p.m.	Prof. Hyo-Jun Ahn <i>Gyeongsang National University</i>	The Effect of Electrolytes and Cathodes on the Electrochemical Performance of Lithium/sulfur Batteries
2:20 p.m. - 2:40 p.m.	BREAK before Optional Tours	
2:40 p.m. - 5:30 p.m.	<b>LBL Lab Tours:</b> Shuttle buses will leave at approximately 3:00 p.m. from directly outside the Main Lobby. Return shuttle service to the Claremont Hotel will be provided until 6:00 p.m.	
2:40 p.m. - 5:00 p.m.	<b>Tour of local Alameda Island Wineries:</b> Shuttle buses will leave at approximately 3:00 p.m. from directly outside the Main Lobby. Return shuttle service to the Claremont Hotel will be provided.	