

Special One Day Symposium

Lithium Battery & Fuel Cell

Hybrid Systems

Conveniently timed with

Lithium Mobile Power 2008
December 8-9, 2008

***Fuel Cells Durability
& Performance 2008***
December 11-12, 2008

Utilizing Hybrid Technology
to Deliver Successful
Commercial Applications

December 10, 2008

Las Vegas, NV USA



www.knowledgefoundation.com



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SPONSORSHIP AND EXHIBIT OPPORTUNITIES

Attendees at this event represent the very top industry, government and academic researchers from around the world and provide an extremely targeted and well-qualified audience for exhibitors and sponsors. Your participation as an exhibitor or sponsor is the most cost effective way to gain high quality, focused exposure to these industry leaders. Among other benefits, sponsorship packages include your logo on marketing materials to promote your participation and expose your company to 10's of thousands of prospects prior to the program - in addition to the highly targeted audience we deliver at the event itself.

CONFERENCE SPONSORSHIPS

A variety of conference sponsorships are available which offer incremental levels of visibility to conference delegates at the event — as well as opportunities for marketing exposure prior to the event. Taking advantage of pre-conference options has the added benefit of getting your organization's name out to a large group of interested decision makers.

NETWORKING EVENT SPONSORSHIPS

These "mini" sponsorships offer representatives of your organization a dedicated opportunity to network with conference delegates — with your organization clearly recognized as the host of the event.

- Cocktail Receptions
- Luncheons
- Dinner Banquets
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WORKSHOP SPONSORSHIPS

Your company may sponsor an instructional workshop (subject to approval) for delegates in conjunction with the conference. Highlight your organization's expertise! Delegate feedback indicates that these scientific/technical vehicles enhance retention of your organization's presence in their minds — increasing the potential for drawing customers long after the conference is over.

Call Lindsay Kennedy at (617) 232-7400 ext. 210 or email lkennedy@knowledgefoundation.com today for pricing information and customization options.

CALL FOR SPEAKERS, SCOPE SUGGESTIONS, SESSION TOPICS & DISCUSSION LEADERS

Most of the oral presentations will be invited. At this time we welcome solicitations for invited speakers, scope of the conference, session topics and discussion leaders. If you are interested in being considered for one of these roles or would like to recommend someone, please submit a proposal for the Program Committee's consideration. Please direct all the inquires via email to submit@knowledgefoundation.com

COMPREHENSIVE DOCUMENTATION AVAILABLE

Nothing can substitute the benefits derived from attending **Lithium Battery & Fuel Cell Hybrid Systems**. But if your schedule prevents you from attending, this invaluable resource is available to you. Please allow 3-4 weeks after the conference date for delivery. *Note: Documentation is included with conference fee for registered delegates.*

Conveniently timed with two other special events

**LITHIUM
MOBILE
POWER
2008**

4th
International
Conference

Advances in
Lithium Battery
Technologies
for Mobile
Applications

December 8-9, 2008 • Las Vegas, NV USA

4th Annual International Conference

**FUEL CELLS
DURABILITY &
PERFORMANCE
2008**

Real World Solutions to the Most Significant Challenges
Facing Fuel Cells Commercialization

December 11-12, 2008 • Las Vegas, NV USA



Symposium Agenda

LITHIUM BATTERY & FUEL CELL HYBRID SYSTEMS

Utilizing Hybrid Technology to Deliver Successful Commercial Applications

Wednesday, December 10, 2008

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9:00 *Registration, Exhibit Viewing/Poster Setup, Coffee and Pastries*

10:10 Organizer's Welcome and Opening Remarks

10:15 Fuel Cell and Battery Hybrid Systems

Zhigang Qi, PhD, Fellow, MTI Micro Fuel Cells Inc.*

A fuel cell system can hardly run smoothly without a battery (or a capacitor). The crucial functions played by the battery when it is used to assist the fuel cell comprise of starting the fuel cell system, providing power during a power demand surge, and shutting down the fuel cell system after the fuel cell stack is turned off. The battery can also be used as the primary power source with the fuel cell as a charger. MTI Micro Fuel Cells Inc. develops direct methanol fuel cell systems that utilize neat methanol and unhumidified ambient air for portable applications. Thousands of hours of single cell life tests showed that the fuel cell decay rate could be controlled to 6% or less per 1000 hours. The fuel cell stack called Mobion® Chip has demonstrated an initial power density over 60 mW/cm², 1.8 Wh energy output per gram of methanol, and higher than 80% fuel utilization. The fuel cell system can operate from 0 to 40°C ambient temperatures at any humidification levels. *In collaboration with: G.Lu, C.Carlstrom, and J.Pruett

10:45 Commercial Direct Ethanol Fuel Cell/Li Ion Hybrid System for Portable Power Applications

John M. Pope, PhD, Director, NDC Power

This paper will present a new commercially available direct ethanol fuel cell integrated into a Li-ion hybrid portable power charging station. Fuel cell stack performance including >3,000 hours at 50 mA/cm² will be detailed, along with an overview of the materials and engineering that have enabled a 90% reduction in stack costs over DMFC technology. Full system performance will also be detailed for a 20 W portable charging station that utilizes replaceable fuel cartridges.

11:45 Direct Glycerin Fuel Cell & Lithium-Ion Battery Hybrid for Mobile Applications

Steven R. Ragsdale, PhD, MBA, Chief Technology Officer, CyVolt Energy Systems, Inc.

A direct glycerin fuel cell has been developed for mobile applications. The fuel cell combines a lithium-ion battery and power management into a hybrid system that seamlessly integrates with most commercial electronic devices. The hybrid system allows the superior power density of batteries and high energy density of fuel cells to be preserved. The fuel cell technology to be presented utilizes a passive-cell design that minimizes parasitic losses from balance-of-plant components. An anion-exchange membrane (AEM) configuration generates an electroosmotic flow that impedes fuel crossover and water management problems, increases fuel cell efficiency and allows the use of higher fuel concentrations.

12:15 Low- to Mid-Power Fuel Cell / Battery Hybrid Systems

Jeremy Steinshnider, PhD, Director of Fuel Cell Technology, Lynntech Inc.

This presentation will address current technological advances and market opportunities for fuel cell / battery hybrid power systems. An overview of recent technological advancements in Lynntech's low- and mid-power fuel cell / battery hybrid power systems will be presented. Specific topics to be discussed will include power management, thermal management, fuel cell architecture, and hydrogen generation.

12:45 Li Battery / Fuel Cell Hybridization to Extend System Lifetime and Usability

Mack W. Knobbe, VP of Engineering, Jadoo Power

Fuel cells and batteries are natural companions to creating an optimized power solution. Fuel cell sub-systems provide improved energy storage density while lithium batteries provide high peak power capabilities. Beyond this known advantage is the ability of the combination to extend the life of both components. Additionally, a hybrid power system can enable the use of an array of fueling options, including chemical hydrides that may not have hydrogen available immediately.

11:15 *Networking Refreshment Break, Exhibit/Poster Viewing* 1:15 *Lunch*



Symposium Agenda

LITHIUM BATTERY & FUEL CELL HYBRID SYSTEMS

Utilizing Hybrid Technology to Deliver Successful Commercial Applications

Wednesday, December 10, 2008

2:45 **Expand the Life and Capacity of Lithium Battery in Plug-In Hybrid Electric Vehicles**

**Chris Mi, PhD, Chief Technical Officer,
1Power Solutions**

Lithium batteries are considered as the only viable energy storage solution for PHEV. The main issues of lithium battery include cost, cycle life, calendar life, energy density, power density, and safety. In particular, battery safety and longevity issues are significantly magnified in PHEV. These issues can be addressed using a battery cell voltage equalizer. This presentation compares different balancing methods of lithium batteries. Several cell equalizer configurations will be explored, including passive balancing, active balancing, and 1Power ASIC based solutions.

Michigan, which comprises a partnership with General Motors and DTE Energy, aimed at equipping engineers to work in the vehicle and grid spaces, and the intersection of the two.

3:45 *Networking Refreshment Break, Exhibit/Poster Viewing*

4:00 **Featured Panel Discussion**

Moderated by:

**Kev Adjemian
Nissan Technical
Center North America**

(Please See Full Details Below)

3:15 **High-Power Batteries: Enabling Technologies and Education for the Drivetrains of the Future**

**Ann Marie Sastry, PhD, Professor of Mechanical,
Biomedical and Materials Science and
Engineering; Director, Energy Systems
Engineering Program, University of Michigan**

By its nature, energy systems design comprises a multidisciplinary exercise, not only within science and engineering, but also in developing policies that promote sustainable systems. We first discuss modeling strategies which have improved our ability to select materials for batteries. Then, we describe educational strategies employed in the new Master of Energy Systems Engineering Program at the University of

5:00 *End of Symposium*

FEATURED PANEL DISCUSSION

The Electrification of the Automobile The 21st Century Shift

Moderator:

**Kev Adjemian, PhD, Head, Fuel Cell Laboratory,
Nissan Technical Center North America, Inc.**

- Available technology pathways: HEV, PHEV, EV, FCV Pros and Cons
- Technology barriers which still exist
- Market trends
- Market adoption

**FEATURED
PANEL
DISCUSSION**

WEDNESDAY,
DECEMBER 10, 2008

4:30- 5:30 PM



Lithium Battery & Fuel Cell Hybrid Systems

December 10,
2008

Utilizing Hybrid Technology to Deliver Successful Commercial Applications



Become a member of the Alliance today and save 15% off your conference registration to **Lithium Battery & Fuel Cells Hybrid Systems 2008**

For complete membership information go to:
www.knowledgefoundation.com

REGISTRATION FORM

3004 ONLINE

Mon 12/8	Tue 12/9	Wed 12/10	Thu 12/11	Fri 12/12	Member Rate		Non-Member Rate	
LiMP 2008		Hybrid Sym.	FCD 2008		Comm.	Acad/Gov't	Comm.	Acad/Gov't
3-Day Pass (LiMP 08 + Hybrid Sym.)					<input type="checkbox"/> \$1359	<input type="checkbox"/> \$934*	<input type="checkbox"/> \$1599	<input type="checkbox"/> \$1099*
		3-Day Pass (Hybrid Sym. + FCD 08)			<input type="checkbox"/> \$1359	<input type="checkbox"/> \$934*	<input type="checkbox"/> \$1599	<input type="checkbox"/> \$1099*
2-Day Pass (LiMP 08)					<input type="checkbox"/> \$1019	<input type="checkbox"/> \$679*	<input type="checkbox"/> \$1199	<input type="checkbox"/> \$799*
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		1 Day Pass (Hybrid)			<input type="checkbox"/> \$424	<input type="checkbox"/> \$339*	<input type="checkbox"/> \$499	<input type="checkbox"/> \$399*
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Payment: All payments must be made in U.S. funds drawn on a U.S. bank. Please make check(s) payable to The Knowledge Foundation, Inc. and attach to the registration form even if you have registered by phone, fax or e-mail. To guarantee your registration, payment must be received prior to the conference. Confirmation of your booking will follow.

Discount Accommodations and Travel: A block of rooms has been allocated at a special reduced rate. Please make your reservations by November 1, 2008. When making reservations, please refer to The Knowledge Foundation. Contact The Knowledge Foundation if you require assistance.

Venue: **Las Vegas Hilton**
3000 Paradise Road
Las Vegas, NV 89109

For Hotel Reservations Contact:

Andersen Travel
Phone: (508) 429-6494 or 1-800-229-6494
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Email: kramer@andersentvl.com

Substitutions/Cancellations: A substitute member of your company may replace your attendance at any time at no charge if you find your schedule prevents you from attending. Please notify us immediately so that materials can be prepared. If you do not wish to substitute your registration, we regret that your cancellation will be subject to a \$100 processing fee. To receive a prompt refund, we must receive your cancellation in writing 30 days prior to the conference. Unfortunately cancellations cannot be accepted after that date. In the event that The Knowledge Foundation, Inc. cancels an event, The Knowledge Foundation, Inc. cannot resume responsibility for any travel-related costs.

Unable to Attend?

You can purchase a full set of conference documentation. Simply check the box on the registration form and send it to us along with your payment. Please allow 4 weeks after the conference date for delivery.

- I would like to make a poster space reservation at \$65 per poster. Number of posters: _____
- I would like to become a member of the Knowledge Foundation Technology Commercialization Alliance:
 - \$199/yr Individual Commercial Member \$99/yr Individual Student Member
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*The academic/government rate is extended to all participants registering as full time employees of government and universities. To receive the academic/government rate you must not be affiliated with any private organizations either as consultants or owners or part owners of businesses.