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MATERIALS CHALLENGES IN ALTERNATIVE & RENEWABLE ENERGY

February 21-24, 2010

Hilton Cocoa Beach Oceanfront | Cocoa Beach, Florida, USA

www.ceramics.org/energy2010

MATERIALS CHALLENGES IN ALTERNATIVE & RENEWABLE ENERGY



2010 Co-chairs, **George G. Wicks** (Savannah River National Lab) and **Jack G. Simon** (Technology Access)

Materials Challenges in Alternative & Renewable Energy aims to facilitate information sharing on the latest developments involving materials for energy systems. The 4-day technical forum will cover challenges & innovations in solar energy, wind power, hydropower, geothermal, biomass, nuclear, hydrogen, and batteries & energy storage materials. **Energy 2010** will include tutorials and invited presentations of leading energy alternatives, provided by global leaders, along with technical sessions addressing state-of-the-art

SCHEDULE

Sunday, February 21, 2010

5:00 - 7:00 p.m. Welcome Reception

Monday, February 22, 2010

8:15 - 8:30 a.m. Opening Remarks
 8:30 a.m. - 12:15 p.m. Tutorial Speakers (1-5)
 12:15 - 2:00 p.m. Lunch
 2:00 - 5:30 p.m. Tutorial Speakers (6-9)
 7:30 - 9:30 p.m. Dinner

Tuesday, February 23, 2010

8:00 a.m. - Noon Concurrent Technical Sessions
 1:40 - 5:00 p.m. Concurrent Technical Sessions
 7:00 - 9:00 p.m. Poster Session

Wednesday, February 24, 2010

8:00 a.m. - Noon Concurrent Technical Sessions
 1:40 - 5:00 p.m. Concurrent Technical Sessions

materials issues involved with these future energy sources. **Energy 2010** is intended for not only scientists and engineers active in energy and materials science, but also those new to the field. Sign up now to enjoy registration savings.

Tutorial Speakers



Chiang

Batteries

Yet-Ming Chiang, Massachusetts Institute of Technology

Title: Advances in Battery Technology



Stetson

Hydrogen

Ned Stetson, U.S. Department of Energy

Title: Achievements and Perspectives of the U.S. National Program on Hydrogen Storage



Raffaele

Solar

Ryne Raffaele, National Renewable Energy Lab

Title: Photovoltaics: Past, Present and Future



Zayas

Wind

Jose R. Zayas, Sandia National Labs

Title: Wind: Background, Technology Opportunities and Material Challenges



Zinkle

Nuclear

Steve Zinkle, Oak Ridge National Lab

Title: Materials Challenges in Nuclear Energy



Verbrugge

General

Mark Verbrugge, General Motors Research & Development Center

Title: Material Needs in Alternative & Renewable Energy for the Automotive Industry



Billings

Kevin Billings, Lockheed Martin

Title: Energy Efficiency and Security



Wright

Gary Wright, Air Force Research Lab

Title: Air Force Energy Strategy



Wolf

Sandra DeVincent Wolf, MRS

Title: Advanced Materials for our Energy Future: Study Results

For complete details, visit www.ceramics.org/energy2010

SOLAR

Topic Champions:

Dr. Abhi Karkamkar, PNL

Dr. Joel Ager, LBNL

The conversion to electricity can take place by photovoltaic (PV) or solar cells, as well as by use of solar power plants. There are currently more than a dozen major solar plants in the US, with most of these facilities located in California.

Sessions

	Date	Time
Session I	23-Feb	a.m.
Session II	24-Feb	a.m.

WIND

Topic Champion:

Mr. Jose Zayas, SNL

Topic Co-champions:

Mr. Tom Ashwill, SNL

Dr. Doug Cairns, Montana State University

Rita Forman-House, ASM International

Wind power plants or wind farms often consist of many individual units. The largest wind farm located in Texas, consists of over 400 wind turbines that generate enough electricity to power about a quarter of a million homes each year. The US is ranked second in the world in wind power capacity, only following Germany. In countries such as Denmark, about 20% of its electricity is generated from the wind.

Sessions

	Date	Time
Session I	23-Feb	p.m.
Session II	24-Feb	a.m.

HYDROPOWER

Topic Champion:

Dr. Brenda Garcia-Diaz, SRNL

Topic Co-champion:

Dr. Kristine Zeigler, SRNL

Hydropower is the most often used form of renewable energy in the US. Over half of the US hydroelectric capacity to generate electricity is located in three states: Washington, California and Oregon, with the largest facility being the Grand Coulee Dam in Washington. Hydropower currently accounts for about 6% of the total electricity generated in the US.

Sessions

	Date	Time
Session I	24-Feb	p.m.

GEOTHERMAL

Topic Champion:

Ms. Hidda Thorsteinsson, DOE

Topic Co-champion:

Ms. Agatha Wein, DOE

The US produces more geothermal electricity than any other country, but this still amounts to less than 1/2 of one percent of all energy generated. Most geothermal reservoirs are deep underground but can find their way to the surface as

volcanoes, hot springs and geysers. California has almost three dozen geothermal power plants that produce the largest fraction of US energy from this source.

Sessions

	Date	Time
Session II	24-Feb	p.m.

BIOMASS

Topic Champion:

Dr. Edgar Lara-Curzio, ORNL

Topic Co-champion:

Mr. Tim Theiss, ORNL

Biomass is energy derived from organic plant and animal matter including wood, crops, manure, and municipal solid wastes. When burned, the energy in biomass is released as heat but it can also be converted to other forms of energy

Advisory & Technical Planning Committee

Dr. Jack Simon, Alpha Sigma Mu Honorary Society

Dr. George Wicks, Savannah River National Lab

Dr. Thad Adams, Savannah River National Lab

Dr. Joel Ager, Lawrence Berkeley National Lab

Dr. Ming Au, Savannah River National Lab

Dr. Amir Farajian, Wright State Univ.

Ms. Rita Forman-House, ASM International

Dr. Brenda Garcia-Diaz, Savannah River National Lab

Dr. Frank Goldner, U.S. Dept. of Energy

Prof. Hong Huang, Wright State Univ.

Dr. M. Ashraf Imam, Naval Research Lab

Dr. Natraj Iyer, Savannah River National Lab

Prof. Puru Jena, Virginia Commonwealth Univ.

Dr. Enamul Haque, Bostik, Inc.

Dr. Abhi Karkamkar, Pacific Northwest National Lab

Dr. Gene Kim, Cookson Electronics

Ms. Lesley Kyle, Society for Plastics Engineers (SPE)

Dr. Edgar Lara-Curzio, Oak Ridge National Lab

Mr. Richard Marczewski, Savannah River National Lab

Dr. Rana Mohtadi, Toyota Technical Center, NA

Dr. Ali Raissi, Florida Solar Energy Center, Univ. of Central Florida

Dr. Bhakta Rath, Naval Research Lab

Dr. Robert Sindelar, Savannah River National Lab

Prof. Rick Sisson, Worcester Polytechnic Institute

Ms. Hidda Thorsteinsson, U.S. Dept. of Energy

Ms. Agatha Wein, U.S. Dept. of Energy

Mr. Jose Zayas, Sandia National Labs

Dr. Kristine Zeigler, Savannah River National Lab

Dr. Ragaiy Zidan, Savannah River National Lab

Mr. Mark Mecklenborg, The American Ceramic Society

Mr. Greg Geiger, The American Ceramic Society

like methane gas, ethanol and biodiesel. Biomass fuels currently account for about 3% of the energy used in the US.

Sessions

Session I

Date

23-Feb

Time

p.m.

NUCLEAR

Topic Champions:

Dr. Robert Sindelar, SRNL

Dr. Frank Goldner, DOE

Topic Co-champion:

Dr. Natraj Iyer, SRNL

On a global scale, there are more than 400 operating nuclear power plants in more than 30 countries, which generate about 30% of the energy produced in the European Union and almost 20% of the energy produced in the US. Among the advantages of nuclear energy are no greenhouse emissions.

Sessions

Session I

Session II

Session III

Date

23-Feb

23-Feb

24-Feb

Time

a.m.

p.m.

p.m.

HYDROGEN

Topic Champions:

Dr. Rick Sisson, WPI

Dr. Ragaiz Zidan, SRNL

Hydrogen can be produced from a variety of domestic sources, including fossil fuels as well as from renewable resources and can be stored in gas, liquid or solid forms. There is considerable work in progress on development of materials and systems for effective hydrogen storage. This alternative is considered a promising energy concept of the future, but like many alternatives, there currently is no infrastructure in place to produce, store, transport or distribute hydrogen effectively.

Sessions

Session I

Session II

Session III

Session IV

Date

23-Feb

23-Feb

24-Feb

24-Feb

Time

a.m.

p.m.

a.m.

p.m.

Cocoa Beach 1,000 Islands- In Search of Wildlife

Monday, February 22, 2010

12:30 to 3:30 p.m.

\$80 per person

Enjoy Island Boat Lines' 2 hour eco-tour of Cocoa Beach's 1,000 Islands on Florida's Space Coast. You'll have the opportunity to see herds of manatees, flocks of birds, and playful dolphin. Register online or send in the Registration Form.



BATTERIES & ENERGY STORAGE

Topic Champion:

Dr. Thad Adams, SRNL

Topic Co-champion:

Dr. Ming Au, SRNL

Batteries are devices that convert chemical energy into electrical energy. There are many types of batteries available, representing a multi-billion dollar industry. Among the battery types of much interest are standard lead acid batteries and Li-ion batteries. Materials improvements are critical in making these energy systems more effective in the future.

Sessions

Session I

Session II

Session III

Date

23-Feb

24-Feb

24-Feb

Time

a.m.

a.m.

p.m.

HOTEL INFORMATION

Hilton Cocoa Beach Oceanfront

1550 North Atlantic Ave
Cocoa Beach, Florida 32931 USA

Tel: 1-321-799-0003
or 1-866-580-7402 (U.S. Toll Free)
Fax: 1-321-799-0344



Room Rates

Single/Double/Triple/Quad
- &159.00/night plus tax
Government - Current
Government per diem rate

Cut Off Date

January 29, 2010

When making a reservation by phone, please reference the code ACS to secure your reservation at the negotiated conference rate.



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February 21-24, 2010



4 ways to register

Early Registration Deadline:
January 21, 2010

MAIL

The American Ceramic Society
L-2625, PO Box 600001
Columbus, OH 43260-2625 USA

FAX

1-301-206-9789
(Credit Cards Only)

WWW

www.ceramics.org
(Credit Cards Only)

PHONE

1-866-721-3322 U.S.
1-240-646-7054 Int'l.
(Credit Cards Only)

Please print

This is my work address home address school address

Member No.	First Name	M.I.	Last Name
Job Title		Dept.	
Company/Affiliation/School			
Street Address			
City	State/Province	Postal Code	Country
Phone		Fax	
E-mail			

Billing Address

Same as Above

Address _____

City _____ State _____ Zip _____

Country _____

Registration

Registration	EARLY REG. THROUGH JAN. 21	AFTER JAN. 21
Member*†	<input type="checkbox"/> \$595	<input type="checkbox"/> \$695
ACerS Member with 12-Month Membership Renewal*†	<input type="checkbox"/> \$710	<input type="checkbox"/> \$810
Nonmember	<input type="checkbox"/> \$710	<input type="checkbox"/> \$810
Committee Member/Speaker	<input type="checkbox"/> \$545	<input type="checkbox"/> \$645
ACerS Emeritus/Senior†	<input type="checkbox"/> \$445	<input type="checkbox"/> \$545
One Day: Member*†	<input type="checkbox"/> \$445	<input type="checkbox"/> \$545
One Day: Nonmember	<input type="checkbox"/> \$560	<input type="checkbox"/> \$660
Material Advantage Student Member‡	<input type="checkbox"/> \$160	<input type="checkbox"/> \$210
Student: Not in Material Advantage	<input type="checkbox"/> \$195	<input type="checkbox"/> \$245
Extra Conference Dinner Ticket	<input type="checkbox"/> \$65	<input type="checkbox"/> \$65
Extra Conference Proceedings (6 months after meeting)	<input type="checkbox"/> \$95	<input type="checkbox"/> \$95
Optional Tour	<input type="checkbox"/> \$80	<input type="checkbox"/> \$80
GRAND TOTAL	\$ _____	\$ _____

*ACerS/ASM/SPE/MRS/SAMPE Member

‡ ACerS members: Select free division membership on top right

Note 1: All registrations include conference dinner, welcome reception, poster reception, and breaks.

Note 2: Conference Proceedings provided 6 months after meeting to member, nonmember, emeritus, and speaker registrations.

ACerS Membership‡

If you are not a member of a division, choose one free division affiliation below.

- Art
- Basic Science
- Cements
- Electronics
- Engin. Ceramics
- Glass & Optical Materials
- Nuclear & Environ. Tech.
- Refractory Ceramics
- Structural Clay Products
- Whitewares & Materials

Membership includes online access to *Journal of the American Ceramic Society*, *International Journal of Applied Ceramic Technology*, and the new *International Journal of Applied Glass Science*. Also includes print subscription and online access to *American Ceramic Society Bulletin*.

Optional Tour

Cocoa Beach 1,000 Islands - In Search of Wildlife

Enjoy the 2-hour eco-tour of Cocoa Beach's 1,000 Islands on Florida's Space Coast. In Search of Wildlife will give you the opportunity to see herds of manatees, flocks of birds, and playful dolphin. The \$80 per person tour is scheduled for Monday, February 22.

Payment

Check for \$ _____ enclosed.

(PAYABLE TO: THE AMERICAN CERAMIC SOCIETY. MUST BE IN U.S. DOLLARS AND DRAWN ON A U.S. BANK.)

Charge \$ _____ to my credit card:

- VISA MC AMEX

ACCT. NUMBER

EXP. DATE

NAME ON CREDIT CARD

SIGNATURE

Cancellation Policy: Full refund less \$50 if cancelled on or before January 21, 2010; 50% refund if cancelled between January 22, 2010 and February 20, 2010; no refunds after the start of the conference.

For Hotel Accommodations call the Hilton Cocoa Beach Oceanfront
1-800-526-2609 or 1-321-799-0003



The American Ceramic Society
600 N. Cleveland Ave., Suite 210
Westerville, Ohio 43082 USA

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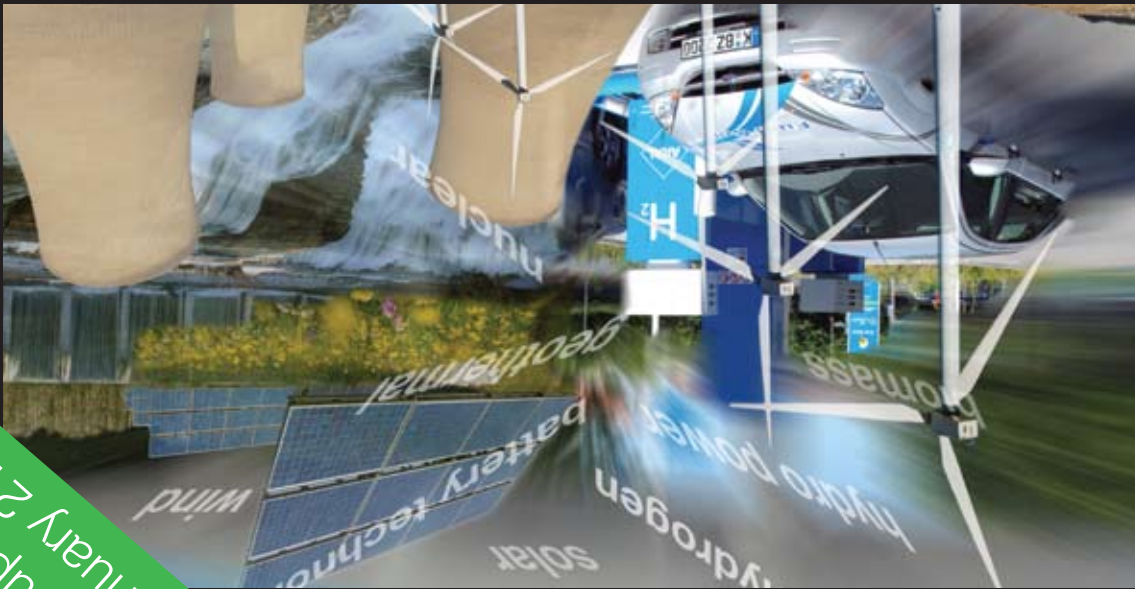
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