Materials Challenges In Alternative & Renewable Energy

February 16-20, 2014 | Hilton Clearwater Beach Resort, Clearwater, Florida, USA

www.ceramics.org/mcare2014

CALL FOR PAPERS

Abstract Deadline: September 19, 2013

Organized by:

The American Ceramic Society
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Materials Challenges In Alternative & Renewable Energy (MCARE 2014)

MCARE 2014 is a flagship event on materials and energy challenges organized by The American Ceramic Society and ASM International. The Materials Research Society has once again endorsed MCARE in 2014. MCARE 2014 is a premium forum addressing emerging materials technologies and emphasizing the future challenges in achieving a cleaner and sustainable global society. This important conference builds on the success of three previous conferences held in 2008, 2010, and 2012 in the United States along with a collaborative event held in China in 2013.

MCARE 2014 will bring together leading global experts from industry, academia, R&D laboratories and government agencies, thus providing a unique opportunity for communication and collaboration essential to propel a multi-disciplinary dialogue on innovative and sustainable solutions in the field of alternative and renewable energy. This cutting-edge international conference will feature plenary and invited talks, thematically focused technical sessions and poster presentations enabling the delegates to network and exchange ideas with their professional peers and acclaimed experts.

MCARE 2014 will appeal to academic and industrial scientists working on energy solutions. It emphasizes the participation of students and early stage researchers, and features a student poster contest and at least one other student-designed event. In addition, special activities for young professionals and interested participants are planned to enhance the awareness of materials challenges in alternative and renewable energy sources. Finally, plans are underway to bring back the popular Ride and Drive program, which provides conference attendees the opportunity to test drive state-of-the-art vehicles.

The scientific and technical scope of the meeting is to present new advances and research results in the fields of materials, energy, and environment technologies.

Submit your abstract by September 19th in these technical tracks:

HYDROGEN

Hydrogen can be produced from a variety of 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 the development of materials and systems for effective hydrogen storage. This track will focus on H-separations, H-interactions and effects on materials; new methods and novel materials for H-Storage; theoretical studies of H-storage materials and additional practical use in energy storage systems; absorption, catalysis and means of enhancing H-interaction with materials; and analytical methods and characteristics of novel hydrogen storage systems.

Organizer and Point of Contact: Ragaiy Zidan, Savannah River National Laboratory, USA, ragaiy.zidan@srnl.doe.gov

SOLAR FUELS

Direct production of fuels from solar energy represents the most prominent and promising avenue for sustainable energy solutions derived from regenerative, primary energy sources. The utilization of solar energy not only calls for efficient photovoltaic and photoelectrochemical devices, but also for identification of abundant, inexpensive, and stable photoactive materials enabling efficient light harvesting, charge separation and collection, and chemical transformations. This track will address science and technology of energy harvesting modules based on photonic stimulation of semiconductor materials, including novel structures for solar thermal, solar hydrogen, and artificial photosynthesis and will explore new ideas and materials challenges associated with the generation of chemical fuels from water and other regenerative feedstock using solar energy.

Organizers: J.R. Morante, Catalonia Institute for Energy Research, Spain; L. Vayssieres, Xian Jiao-Tong University, China; Dun-Wei Wang, Boston College, USA; Sanjay Mathur, University of Cologne, Germany; Menka Jain, University of Connecticut, USA; Volkmar Lüthen, Siemens, Germany; and Ravi Ravindra, New Jersey Institute of Technology, USA

Point of Contact: Sanjay Mathur, sanjay.mathur@uni-koeln.de

SOLAR POWER AND CONCENTRATORS

Concentrated Solar Power (CSP) is becoming a key technology for large-scale grid power generation using solar energy. There is significant on-going efforts worldwide to bring down the cost to produce electricity from CSP. This requires development of new materials and systems that are cost effective and/or more efficient over the current materials. This track will address the challenges and opportunities in the development of materials and systems for solar collectors, thermal receivers, heat transfer fluids, thermal energy storage, and power cycle components.

Organizer and Point of Contact: Dileep Singh, Argonne National Laboratory, USA, dsingh@anl.gov

Program Co-Chairs

H.T. Lin, Oak Ridge National Laboratory

Sanjay Mathur, University of Cologne, Germany

Ragaiy Zidan, Savannah River National Laboratory

MCARE Founders and MCARE 2014 Advisory Program Co-Chairs

George Wicks

Jack Simon

Abstract Submission Instructions

Vist www.ceramics.org/mcare2014 to submit your abstract. Follow the prompts to create an account on the Abstract Central website. If you have questions, please contact Marilyn Stoltz at 614-794-5868 or mstoltz@ceramics.org.

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BATTERIES AND ENERGY STORAGE

Batteries are devices that convert chemical energy into electrical energy. There are many types of batteries available, representing a multi-billion dollar industry. The state-of-the-art electrical energy storage systems are not able to meet the requirements for energy-efficient use in transportation, grid and commercial technologies. Battery technology seeks new concepts in materials design to overcome the current limitations of performance and lifetime. More critical insight is required to both in terms of material structures as well as interfacial reactions to produce next-generation electrode materials and battery cells enabling higher energy densities and longer cycling abilities. This track will explore novel energy storage materials and technologies that are critical in making the current energy systems more effective in the future.

Organizers: **Palani Balaya**, National University of Singapore, Singapore; **Sridhar Komarneni**, Pennsylvania State University, USA; **Robin von Hagen**, University of Cologne, Germany; **Arumugam Manthiram**, University of Texas at Austin, USA; **Madhavi Srinivasan**, Nanyang Technical University, Singapore

Point of Contact: **Palani Balaya**, mpepb@nus.edu.sg

NANOCOMPOSITES AND NANOWIRES MATERIALS FOR PHOTOVOLTAIC AND PHOTONIC TECHNOLOGIES

Advanced engineering and integration of new materials architectures and manufacturing technologies carry the promise of achieving substantial improvements in energy harvesting technologies. There has been a tremendous increase in the use of nanostructured materials to improve the existing energy systems based on conventional and renewable energy sources. This track will focus on the use of nanocomposites and nanowires for photovoltaic and photonic applications with novel functionalities to enhance materials performance, including high efficiency of energy conversion and utilization. Innovative photonic concepts for renewable energy (e.g., light harvesting, light management, plasmonic structures) will be presented and substantiated by the coverage of more recent materials advancements, such as graphene-based energy-conversion and storage devices. New computational studies providing new insights in the rational design of novel multifunctional materials will also be covered.

Organizers: **Yoon-Bong Hahn**, Chonbuk University, Korea; **S.R.P. Silva**, University of Surrey, UK; **Jordi Arbiol**, ICREA and Institut de Ciencia de Materials de Barcelona, Spain; **Qihua Xiong**, Nanyang Technological University, Singapore

Points of Contact: **Yoon-Bong Hahn**, ybhahn@chonbuk.ac.kr; **Jordi Arbiol**, arbiol@icrea.cat

NUCLEAR

Nuclear power extracts usable energy from controlled nuclear reactions. All aspects of current nuclear energy, including accident tolerance, waste management, energy efficiency, and fuel burn-up, are limited by performances of available qualified materials. Moreover, development of advanced materials that withstand the harsh operating environment is considered the highest priority technology development toward future fusion energy. This track will focus on improved and advanced materials for fuel and structures for nuclear fission and fusion energy.

Organizers: **Yutai Katoh**, Oak Ridge National Laboratory, USA; **Satoshi Konishi,** Kyoto University, Japan

Point of Contact: **Yutai Katoh**, katohy@ornl.gov

CRITICAL RESOURCES

Tying all of the alternative energy technologies together is the availability of the materials needed to solve the issues for creating, storage and distribution of energy. This track will focus on challenges and solutions in materials availability as we develop our new and sustainable energy infrastructure.

Organizer and Point of Contact: **Armin Reller**, University of Augsburg, Germany, armin.reller@physik.uni-augsburg.de

OTHER ENERGY AREAS

In addition, the organizers are seeking abstracts and potential organizers of sessions on Biomass, Wind and Natural Gas. If you are interested in joining the organizing team, please contact **Sanjay Mathur** at sanjay.mathur@uni-koeln.de or **H.T. Lin** at linh@ornl.gov.

FUTURE ENERGY LEADERS

MCARE has a specific mission of engaging and mentoring students and young professionals in the field of novel materials and renewable energy sources to drive the energy sector forward. The organizers strongly encourage the participation of students and young professionals in all aspects of the meeting, including featured activities such as meet the speakers networking events, poster sessions, and more!

Points of Contact: **Geoff Brennecka,** Sandia National Laboratories, USA glbrenn@sandia.gov; **Thomas Fischer,** University of Colgne, Germany, t.fischer@uni-koeln.de

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Rates Single/Double: $179 | Government: Current Per Diem Rate

Cut-off Date January 8, 2013