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TMS 2018

147th Annual Meeting & Exhibition

MARCH 11 – 15, 2018
PHOENIX, ARIZONA

SUBMIT AN ABSTRACT TO:

NUCLEAR REACTOR MATERIALS

MATERIALS AND FUELS FOR CURRENT AND ADVANCED NUCLEAR REACTORS VII

Globally, significant efforts are ongoing to meet the growing energy demand with the increased use of nuclear energy. Extensive work is being performed to develop materials and fuels for advanced nuclear reactors. In addition, efforts are also ongoing to extend the life of existing nuclear power plants. Scientists, engineers, and students at various national laboratories, universities, and industries are working on a number of materials challenges for nuclear energy systems. The objective of this symposium is to provide a platform for these researchers to congregate, exhibit, and discuss their current research work, in addition to sharing the challenges and solutions with the professional community and thus, shape the future of nuclear energy.

Abstracts are solicited in the following topics:

- Nuclear reactor systems
- Advanced nuclear fuels - fabrication, performance, and design
- Advanced nuclear fuels - properties and modeling
- Advanced structural materials - fabrication, joining, properties, and characterization
- Lifetime extension of reactors - nuclear materials aging, degradation, and others
- Experimental, modeling, and simulation studies
- Fundamental science of radiation-material interactions
- Irradiation effects in nuclear materials
- Materials degradation issues - stress corrosion cracking, corrosion, creep, fatigue, and others
- Design of materials for extreme radiation environments
- Radiation measurement techniques and modeling studies
- Nuclear waste - disposal, transmutation, spent nuclear fuel reprocessing

ORGANIZERS

Ramprashad Prabhakaran, Pacific Northwest National Laboratory, USA
Dennis Keiser, Idaho National Laboratory, USA
Raul Rebak, GE Global Research, USA
Clarissa Yablinsky, Los Alamos National Laboratory, USA
Anne Campbell, Oak Ridge National Laboratory, USA

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TMS Structural Materials Division
TMS Corrosion and Environmental Effects Committee; TMS Nuclear Materials Committee

ABSTRACT DEADLINE IS JULY 1, 2017. SUBMIT ONLINE AT www.programmaster.org/TMS2018.

QUESTIONS? CONTACT programming@tms.org

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SUBMIT AN ABSTRACT TO:

ENERGY & ENVIRONMENT

MATERIALS FOR ENERGY CONVERSION AND STORAGE

This symposium is organized into the following themes:

Energy Conversion with Emphasis on SOFCs
Co-organizers: Kyle S Brinkman, Clemson University; Hitoshi Takamura, Tohoku University; Xingbo Liu , West Virginia University; Soumendra Basu, Boston University; Jung Pyung Choi, Pacific Northwest National Laboratory; Prabhakar Singh, University of Connecticut.

Topics include experiments and modeling of the above-mentioned systems including:

- Durability of fuel cell and stack materials
- Thermal-chemical-mechanical stresses/expansion
- Study of thermo-mechanical degradation mechanisms
- Effect of microstructure evolution on properties and efficiency
- Role of grain boundary density, grain size, orientation and grain growth
- Advances in characterization and modeling techniques

Energy Storage with Emphasis on Batteries
Co-organizers: Partha P. Mukherjee, Texas A&M University; Leela M.R. Arava, Wayne State University; George Nelson, University of Alabama in Huntsville

Topics will include:

- Physicochemical interaction in lithium-ion batteries and beyond (e.g. Li-S, Li-air, Na-ion)
- Electrode microstructure - property - performance interplay
- Meso-scale modeling and characterization

Materials Design for Sustainability and Energy Harvesting
Co-organizers: Surojit Gupta, University of North Dakota; Indrajit Dutta, Corning Inc.; Hamidreza Mohseni, BOSCH; D. Wen, University of Leeds
This component of the symposium will focus on a variety of green and sustainable technologies for energy harvesting, additive manufacturing, green tribology, next-generation products and processes, and development of advanced instrumentation and control systems. Proposed session topics include:

- Solar Energy
- Energy Harvesting
- Nanotechnology and next generation multifunctional materials
- Additive manufacturing, 3D printing, and sustainability
- Green Tribology
- Life-cycle analysis of materials and products

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Functional Materials including High Temperature Ceramics and Alloys
Co-organizers: Paul Ohodnicki, National Energy Technology Laboratory; Jung Pyung Choi, Pacific Northwest National Laboratory; Reza Shahbazian-Yassar, University of Illinois at Chicago; Soumendra Basu, Boston University; Dwayne Arola, University of Washington; Josh Gladden, Olemiss; Rajeev Gupta, University of Akron

Materials/Applications:

- Functional oxides/(SOFC, Sensors, Others)
- Ceramics and dielectrics/(battery, insulation dielectrics, capacitors, sensors)
- Solid state batteries/electrolyzers/solid oxide fuel cells/membrane separation/electrolysis cells

Topics will include:

- Coatings for interconnections
- Membrane separation materials, processes and systems (H2, O2, CO2)
- High temperature electrolysis cells
- High temperature performance of functional materials (electrochemical, electronic, optical, etc.)
- In-situ spectroscopy of oxidation state of functional oxides in operation
- Ceramics/composite structures/alloys
- Solid oxide fuel cells, thermal barrier coatings, diesel particulate filters etc.
- Reliability and durability of high-temperature ceramics and alloys, including the effect of residual/operational stresses, corrosion under oxidizing and reducing environment
- Advances in the characterization and modeling techniques including multiscale and in-situ
- Microstructural reconstruction and mapping onto fundamental mechanistic models for predicting overall performance
- Nanostructuring and infiltration of functional electrode materials (SOFC, battery, capacitor) for electronic/electrochemical performance

The intent of this symposium is to provide a forum for researchers from national laboratories, universities, and industry to discuss current understanding of materials science issues in high-temperature processes and accelerate the development and acceptance of innovative materials and test techniques for clean energy technology.

ORGANIZERS

Amit Pandey, LG Fuel Cell Systems Inc., USA

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TMS Energy Conversion and Storage Committee