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ANAHEIM CONVENTION CENTER & ANAHEIM MARRIOTT
ANAHEIM, CALIFORNIA, USA
#TMSAnnualMeeting

SUBMIT AN ABSTRACT FOR THE FOLLOWING TMS2022 SYMPOSIUM:

ENERGY & ENVIRONMENT

Composites for Energy Applications: Materials for Renewable Energy Applications 2022

The depletion of fossil fuels and realization of the detrimental impacts from global warming have highlighted the need for large scale deployment of renewable energy technologies. While the deployment of photovoltaics and wind turbines have significantly increased over the last decade, further research is needed to address storage issues related to intermittency of the renewable energy resource. Furthermore, the cost and availability of materials required for renewable energy technologies, such as rare earth magnets in wind turbines and platinum in hydrogen fuel cells, further increases the challenge associated with the practicality of wide scale deployment. Composite materials have recently found applications in several renewable energy applications from hydrogen storage, photoelectrochemical hydrogen production, dye sensitized solar cells, battery electrodes, and various other energy and conversion technologies. Many composite materials alter the electron density distribution within the material as well as provide alternative mechanistic pathways for the conversion or storage of energy.

This symposium will cover recent advances in composite materials which provide improvements in materials for renewable energy applications. Topics of interest include, but are not limited to:

- Synthesis and characterization of composites for hydrogen storage and composite catalyst materials for hydrogen fuel cell applications
- Evaluation of composite materials for lithium-ion battery electrodes and solid-state electrolytes
- Composite photoelectrode materials for photoelectrochemical cells for fuel production
- Composite materials for high temperature thermal energy storage applications including sensible heat, latent heat, and thermochemical heat storage
- Development and characterization of multicomponent photovoltaic materials and improvements in their charge separation and solar irradiance utilization

The scope of the focused sessions will cover the development of composites for advanced energy storage concepts such as:

- Composite materials for the destabilization of metal hydrides for hydrogen storage applications
- Development and characterization of composite materials for enhanced photoelectrode and photovoltaic performance with an emphasis on long-lived charge separated states and increased solar irradiance utilization
- Thermal energy storage composites for enhance thermal conductivity, energy density, and high temperature operation

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