ASME Journal of Thermal Science and Engineering Applications

Special issue on "*Heat Transfer Analysis in Processes of Developing and Applying Renewable Energies and Novel Materials*"

Developing and applying renewable energies have moved to the forefront of scientific studies and industrial applications in recent years due to the rapid depletion of fossil fuel reserve. Likewise, in the last two decades, developing and applying novel materials have been pronounced as core national strategy by many countries for both civil and military purposes. Heat transfer, a fundamental transport phenomenon, can be found in all processes of developing and applying renewable energies and novel materials. Though heat transfer problems in processes of developing and applying renewable energies and novel materials share some commons to those related to traditional energies and materials, the particularities of renewable energies and novel materials can bring several unique issues on heat transfer. For example, the heat transfer mechanisms of solar energy conversion through photovoltaic materials are very different from those in processes of developing and applying traditional energies and materials.

The objective of this special issue is to provide a platform for researchers to report their up-to-date progresses on heat transfer analysis in processes of developing and applying renewable energies and novel materials. We invite contributions of both original research articles and review articles from theoretical, experimental and numerical studies aiming to advance the fundamental understanding and practical application of heat transfer in processes of developing and applying renewable energies and novel materials. Potential topics include, but are not limited to:

- Multi-scale theoretical analysis and model development of heat transfer in processes of developing and applying either renewable energies or novel materials, such as theoretical analysis of radiative heat transfer in nuclear energy utilization or developing sub-models for heat capacity in composite materials.
- Multi-scale simulations of heat transfer in processes of developing and applying renewable energies or novel materials, such as molecular dynamics simulation of heat transfer within the boundary layer of plasma coated materials or computational fluid dynamics simulation of heat efficiency in biomass thermochemical conversion.
- Experimental investigations of fundamental mechanisms of heat transfer in processes of developing and applying renewable energies or novel materials, such as the experimental study of heat transfer mechanisms on photothermal conversion in solar energy and Raman spectrum measurement of thermal conductivity of graphene.
- Combined researches on heat transfer problems involving both renewable energies and novel materials, such as the energy storage of nano-frictional energy using carbon fibers.

- Studies on the similarities and differences of heat transfer between traditional and novel energies, as well as between traditional and novel materials.
- Interactions between heat transfer and other physicochemical phenomena in processes of developing and applying renewable energies or novel materials, such as the coupling of heat transfer, fluid flow and chemical reactions in bioenergy production.

Papers should be submitted via the Journal of Thermal Science and Engineering Applications online submission system. During the submission, please choose the special issue "***DARENM***". All submitted manuscripts will be peer-reviewed according to the usual standards of the journal. The acceptance of a submitted manuscript will be evaluated on the basis of originality, quality, and relevance to this special issue and the journal. All submitted papers should be formatted according to the journal style as described on the journal homepage. We encourage interested authors to contact Guest Editor Dr. Qingang Xiong to discuss the suitability of the proposed paper topic to the special issue before submission.

Important dates

Manuscript submission due: December 31, 2016

Review completion: March 31, 2017

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