

**A Special Issue on**  
**Thermal Energy Storage (TES) &**  
**Concentrated Solar-Thermal Power (CSP)**

**Call for Papers**

Globally, the increase in human population and economic development is driving greater demand for energy in transportation, communications, entertainment, and living comfort. It is expected that the increased fuel consumption globally will exacerbate the issues associated with climate change (e.g., global warming). Therefore, CO<sub>2</sub>-free energy is an emergent issue and in this context, solar energy is an excellent renewable energy alternative. Solar energy can be harvested using Photovoltaics (PV) or using Concentrated Solar-Thermal Power (CSP) plants. While PV is more suitable for distributed and small-scale/domestic power production, CSP provides better economies of scale and therefore is more attractive for utility-scale power generation. An integral part of CSP plants is Thermal Energy Storage (TES) technology that enables operation during disruptions in input power (during cloud cover and overnight). In addition, TES enables the Levelized Cost of Electricity (LCOE) by matching the peak in supply (typically between 1-3 p.m.) to the peak in demand (typically between 4-7 pm). Preliminary estimates indicate that by enhancing the operating temperature of TES modules from 400 °C to 500 °C (or beyond) and by incorporating nanomaterials for TES, the cost of solar power (from CSP plants) be reduced by as much as 50%. This special issue will contain contributions addressing the latest innovations in nanomaterials research with emphasis on the developments involving Heat Transfer Fluids (HTF), molten salts, ionic liquids, nanofluids, radiative thermal energy harvesting, TES, novel CSP architectures, property measurements, numerical modeling, and system-level optimization (including cost models). The special issue is aiming for a broad audience of readers in the field of materials science, thermal sciences, engineering, chemistry, physics, and biology. Potential topics include experimental and numerical research on, but not limited to, the following areas:

- Nanomaterials for thermal energy storage
- Nanomaterials as heat transfer fluids (nanofluids for HTF)
- Experimental metrology/ characterization techniques for high temperature nanomaterials
- Thermal and radiative properties of high temperature nanomaterials
- Nano-scale modes for enhanced energy storage
- Nano-scale thermodynamics
- Application of nanomaterials (e.g., nanofluids) for enhanced radiation capture
- Optical (radiative) properties of nanomaterials for solar thermal power generation
- Novel system design architectures/ configurations and compatible thermodynamic cycles exploring configurations beyond the traditional power tower, dish-Stirling and parabolic trough collectors for higher temperature operation (e.g., exceeding 1000 °C)
- System design issues and cost analyses involving nanomaterials for novel system architectures as well as traditional system architectures – such as power tower, dish-Stirling and parabolic trough collectors

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**MANUSCRIPT SUBMISSION**

Manuscripts must be prepared according to the Journal's guidelines, available at <http://aspbs.com/jnepr>. **Submit your cover letter and manuscript in MS Word or PDF format directly to one of the Guest Editors.** All submissions to this special issue will be subjected to a strict peer review process to ensure that only high quality articles are published. **Please indicate in your cover letter that the submitted paper has not been published previously and is not currently submitted for review to any other journal and will not be submitted elsewhere before a final decision is made by this journal.**

Please notify the Guest Editors well in advance (e.g., 1 month in advance) for your kind intention for submitting a research article/ communication/ review paper.

**Important Dates**

<b>Manuscript Due</b>	May 15, 2012
<b>Authors Notification</b>	March 16, 2012
<b>Publication Date</b>	July 16, 2012