

S3-2 Materials Innovation on Thermal Energy Conversion and Harnessing

SHORT DESCRIPTION:

Heat is the final form of all energy. With the large increase in energy use in recent years, the technological and social importance of effective heat utilization and active heat control has increased. Dramatic advances have been achieved in understanding of electron conduction and its control in solids. On the other hand, understanding of advanced heat utilization and heat control is still underdeveloped. Further research and development of materials and technologies, which enable heat flow control, conversion and recovery of low-grade thermal energy into electric power and other forms of energy is highly demanded. This session provides an opportunity for cross-disciplinary discussions on the development of materials in thermal energy conversion, such as thermoelectric power generation, heat flow control, variable heat conduction, heat storage, super thermal insulation, and super heat transfer, and individual control of electrical and thermal conduction using unique heat behavior using nanostructures. Researchers and scientists in thermal energy and related fields are cordially invited to participate in this symposium.

SESSION TOPICS:

- Novel materials for thermoelectric energy conversion, heat flow control, variable heat conduction, heat storage, super thermal insulation, and super heat transfer
- Advanced phonon engineering and thermal measurement technologies
- Modeling and simulations of electronic and phonon transport
- Advanced synthesis and characterization for bulk, thin film, heterostructures, and nanostructures
- Advanced computer-assisted material design and search for thermal energy materials

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