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TMS 2020

149th Annual Meeting & Exhibition

February 23-27, 2020 • San Diego, California, USA



Submit an abstract to:

Physical Metallurgy

Thermal Transport in Crystalline and Non-crystalline Solids: Theory and Experiments

This symposium solicits presentations covering emerging topics in thermal transport phenomena in solid materials for applications that include thermal management in electronics and energy conversion systems, efficient heat transport, thermal barrier coating, thermal switches, and thermoelectrics. Topics include physical processes that govern heat transport, including behavior of phonons, electrons, magnons, spin density waves, phasons, amplitudons, and other body effects and their interactions. Of particular interest is a mesoscale transport, where the spatial extent of the microstructural inhomogeneity is comparable to the mean free path of the heat carriers. Additionally, areas that consider manipulation of thermal transport by external stimuli, such as electric and magnetic fields, mechanical strain, and chemical potential fields, are invited. Experimental methods on the measurement of bulk conductivity, carrier band-structure, and lifetime using an array of characterization methods will also be considered. The advanced characterization methods may include spectrally resolved thermal transport, electron, x-ray, and neutron scattering. Laser-based methods for measuring thermal transport and propagation of carriers are also of interest. Modeling methods may include ab-initio, density functional theory methods, molecular dynamics simulations, Boltzmann transport equations and others.

Additional topics and material systems of interest include:

- Materials for thermal management and switches for information processing and energy utilizations
- Thermal transport in correlated-electrons, 2D materials, mesoscale effects, extended defects, anisotropic thermal conductivity, many-body effects, and f-electron systems
- Spectroscopy and characterization tools of carrier dispersion, lifetime, anharmonicity
- Control of thermal transport, tunable thermal conductivity, thermal switches
- Picosecond ultrasonics, time domain Brillouin scattering
- Nuclear fuels, solid oxide fuel cells, and batteries

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Abstract Deadline is July 1, 2019. Submit online at
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Questions?
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