

Mechanical Engineering Department Seminar

3:35pm April 5, 2017

1130 Mechanical Engineering

111 Church Street SE, Minneapolis, MN 55455

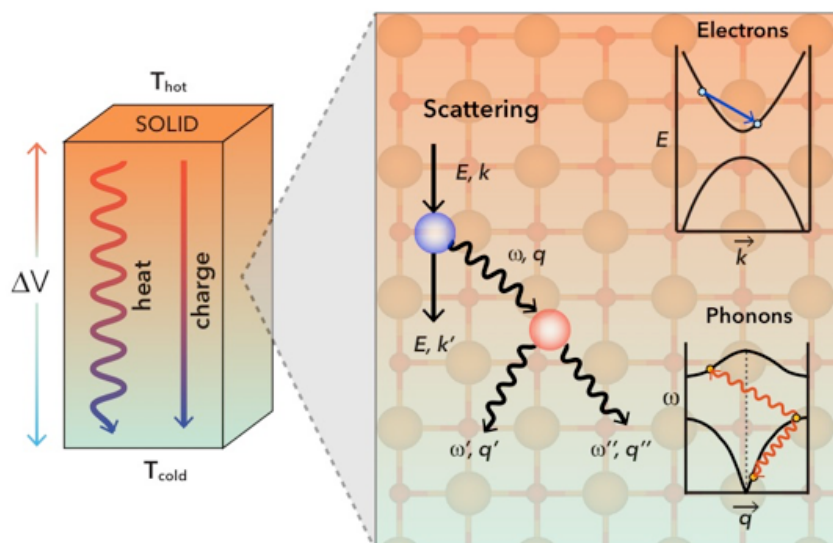


Material Perspectives On Direct Heat To Electricity Conversion

Eric Toberer

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This talk will focus on the development of advanced thermoelectric materials within the Materials Genome Initiative paradigm and the prospects for widespread thermal-to-electric power conversion. These thermoelectric material discovery efforts are driven by a close coupling of theory, computation, and experimental validation. The implementation of a high through-put search of known and hypothetical compounds for thermoelectric performance (NSF-DMREF) has led to the identification of new classes of thermoelectric materials. Further material development involves demonstrating materials with exceptionally strong phonon-point defect scattering cross-sections and strong lattice anharmonicity. In concert with computation, general design principles for next generation thermoelectric materials emerge.



Bio: Eric Toberer is an Assistant Professor in the Physics Department at the Colorado School of Mines with a co-appointment at the National Renewable Energy Laboratory. Much of his current work is on the design of new semiconductors for energy applications, with a focus on photovoltaic and thermoelectric materials. Prior to arriving in Colorado, he was a post-doc at the California Institute of Technology. There, he worked with Jeff Snyder on thermoelectric materials, with a focus on new materials and structure-property relations. As a result of these efforts, Dr. Toberer received the 2011 International Thermoelectric Society Young Investigator Award. In 2015, he received the Cottrell Scholar Award for simultaneous excellence in teaching and scholarship. Dr. Toberer conducted his graduate work with Ram Seshadri at the University of California, Santa Barbara (2002–2006) on the synthesis of hierarchically porous materials.