Physics Colloquium, University of South Florida
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☞*Refreshment available* ☜

Thermal Energy Control by Phonon Coherent Interference in Semiconductor Nanomaterials and Metamaterials

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Phonon wave interference gives rise to phononic band gaps – the analogous to electronic band gaps in semiconductors - which are frequencies ranges for which vibrations are not allowed to propagate within certain periodic structures. In this talk, I will discuss recent developments in understanding and manipulating thermal transport using phonon wave interference and band gaps. Rational design and fabrication of nanostructures provides unprecedented opportunities to create wave-like behaviour of heat and band gap control. Thermal phonon coherent interference can guide heat as photonic and phononic crystals guide light and sound, respectively, leading to a fundamentally new approach to manipulate thermal energy transfer.

Martin Maldovan joined the School of Physics and the School of Chemical & Biomolecular Engineering at the Georgia Insitute of Technology in 2014 as an Assistant Professor. He obtained his B.S. in Physics from the University of Buenos Aires, Argentina and his Ph.D. in Materials Science and Engineering from the Massachusetts Institute of Technology (MIT). His research program is focused on the fundamental understanding and rational design of novel nanostructured semiconductor materials and metamaterials for the next-generation of energy technologies.

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