

UCLA NanoSystems Seminar Series Presents:

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Nano-Phononics: From Concepts to Device Applications

Phonons, i.e. quanta of lattice vibrations, manifest themselves practically in all electrical, thermal and optical phenomena in semiconductors and other material systems. Reduction of the size of electronic devices below the acoustic phonon mean free path creates a new situation for the phonon propagation and interaction. From one side, it may complicate heat removal from downscaled devices, from the other side, it opens up an exciting opportunity for re-engineering phonon properties in nanostructured materials, thus achieving enhanced operation of nano-devices. In this talk I describe the fundamentals of a new sub-field of nanotechnology research – nano-phononics- focusing on how tuning of the phonon spectrum in nanostructures can lead to a reduction or enhancement of thermal conductivity, formation of the phonon stop-bands, changing the optical properties or suppression of the electron – phonon scattering rates. Our recent theoretical and experimental results on phonons in TMV viruses used as biological nano-templates for self-assembly of nanoelectronic circuits will also be discussed.

Tuesday, February 22nd

5:00 PM

UCLA, 50 Court of Sciences

Reception Immediately Following

2033 Young Hall

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