

## Nanoscale Phonon Spectrometer to Investigate Low-Dimensional Heat Transport and Phononic Crystals

Applications are invited to fill a postdoctoral position at Cornell University for research on the emerging field of nanoscale phonon heat transport. Candidate will help develop innovative new tools and methods to measure the wavelength dependence of phonon transmission through nanowires, nanoconstrictions, and phononic crystals.

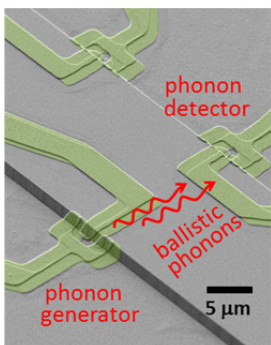
When the characteristic length scale of a material is less than the mean free path (~300 nm) or the wavelength (1 to 50 nm) of thermal phonons, phonon transport is drastically altered due to surface scattering, diffraction and dimensional confinement. We are developing a nanoscale phonon spectrometer to study such effects and have done preliminary work towards this end, using superconducting tunnel junctions (STJs) as the key element in the device [1]. The task now is to adapt this to study phonon transport in nanostructures. The Postdoc will make use of world-class resources at Cornell Center for Nanofabrication, Cornell Center for Materials Research and Cornell Center for Nanoscale Systems to fabricate and study the phonon transport. An ideal candidate will have experience with superconducting devices and be skilled in the operation of sub-kelvin refrigerators and in low-noise measurement techniques. Other valuable skills include experimental experience in thermal properties of materials, as well as photolithography, e-beam lithography, thin-film deposition and etching, and microfabrication and nanofabrication of nanowires and microstructures of silicon, silicon nitride and other dielectrics.

Qualifications: We are seeking highly motivated candidates with an experimental background, outstanding academic record, and publications. The candidates should have a PhD degree in Physics, Applied Physics, Electrical Engineering, Materials Science or a closely related discipline. Applicants should send their CV, list of publications, and contact information for three references to Professor Richard Robinson by electronic mail at [rdr82@cornell.edu](mailto:rdr82@cornell.edu). Please include "Phonon Postdoc" in the subject line.

Applications will be accepted starting December 15, 2011 and will be reviewed until the position is filled. The position begins in the winter/early Spring 2012 for the duration of one year with the possibility for extension of additional years.

[1] J.B. Hertzberg, O.O. Otelaja, N.J. Yoshida, and **R.D. Robinson**, "Non-equilibrium phonon generation and detection in microstructure devices," *Review of Scientific Instruments* **82**, 104905 (2011).

[http://rsi.aip.org/resource/1/rsinak/v82/i10/p104905\\_s1](http://rsi.aip.org/resource/1/rsinak/v82/i10/p104905_s1)



<http://therobinsongroup.org/research/phonon-spectrometer-for-nanoscale-heat-transport/>

<http://www.nature.com/naturejobs/science/jobs/230073-Development-of-a-Phonon-Spectrometer>