



# Bio Nano Robo Seminars

**Tuesday, July 27th, 2010, 14h**

**#32**

C-Lounge, Building C, 2<sup>nd</sup> floor  
IIS-University of Tokyo, Komaba 4-6-1,  
Meguro-ku, Tokyo 153-8505.



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### When Photons listen to Phonons

#### Abstract

How can light be used to generate and detect acoustic and thermal waves in solids?

The principle of Picosecond Ultrasonics and Picosecond thermoreflectance is to use intense (100kW) and ultrashort (100fs) light train pulses as a hammer to produce a thermo acoustic perturbation in a nanomaterial. A second light train pulses is used as a stroboscope to detect the surface motion or temperature with a sub picosecond time resolution.

The thermal and acoustic spectrum can be monitored up to 2THz. The acoustic wavelength is in the order of nanometer. That allows this technique to be very well suited to micro and nano thermal physics, and nanomaterial physical properties measurement.

The principle of Picosecond Ultrasonics and Picosecond thermoreflectance will be explained in simple words. Some applications to time resolved spectroscopy using a super continuum generated by a photonic crystal fiber will be presented. This kind of experiment can be used to generate and observe shear waves at picosecond time scale. This opens a new field for non-contact measurement, metrology and failure analysis in microelectronics. A few applications will be presented.

## FREE ENTRANCE

**a banquet will follow**



More info <http://limmshp.iis.u-tokyo.ac.jp>

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