

INDIAN ASSOCIATION FOR THE CULTIVATION OF SCIENCE

2A & 2B, Raja S.C. Mullick Road, Jadavpur, Kolkata-700032, India

Seminar Notice

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School of Physical Sciences

Title:	Detection of squeezed phonons in pump-probe spectroscopy
Speaker:	Prof. Indranil Paul, Université Paris Diderot and CNRS, France
Date:	June 3, 2022 (Friday)
Time:	15:00 Hours (IST)
Venue:	Physics Seminar Room(C-406),3rd Floor, Centenary Building, IACS
Abstract:	An important goal in out of equilibrium physics is to create states of matter that do not exist in thermal equilibrium. One such goal is the creation of squeezed states of phonons by optically exciting solids. However, in contrast to quantum optical systems, detection of phonon squeezing is subtle and elusive, and an important question is what constitutes an unambiguous signature of it. The state of the art involves observing oscillations at twice the phonon frequency in time resolved measurements of the out of equilibrium phonon fluctuation using pump-probe spectroscopy. In this talk I will discuss why such a signal is a necessary, but not a sufficient signature of a squeezed phonon. I will identify several mechanisms that do not involve squeezing and yet which can produce similar oscillations. I will also discuss a new proposal to detect squeezed phonons reliably, which requires a time and frequency resolved measurement of the phonon spectral function.

All are cordially invited to attend the seminar