

Seminar

Intense Femtosecond Laser-Matter Interaction for Plasma and Material Science

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Ultrashort high-power femtosecond-laser ('extreme light') matter interaction leads to new scientific discoveries and advancement in technological developments. 'Extreme light' is useful for generating laser-plasma on laboratory table-top for high energy density physics, sources of energetic particles and photons, inertial confinement fusion, warm dense matter science, extreme nonlinear conversion to x-ray beams and many such applications. This presentation will demonstrate the first experimental observation of THz acoustics in an 'extreme light'-driven solid density plasma. Thereafter, it will describe another frontier of this research area i.e. the high harmonic generation (HHG), an extreme nonlinear process, which leads to bright, coherent extreme ultraviolet (EUV)/soft x-ray (SXR) beam on laboratory table-top-scale for applications in imaging, spectroscopy, material and nanoscience. Determining the mechanical and thermal properties of a thin membrane is of great interest in modern nanotechnology. HHG based EUV-nanometrology is an efficient method for that. Our recent experiment measures surface acoustic wave dispersion and thermal response in a relatively new material (Si-inverse metalattice) by this metrology. Also the design of a table-top EUV and SXR absorption spectroscopy for material science and warm dense matter science will be discussed in brief.

Thursday, Dec 2nd 2021

10:30 AM

Auditorium, TIFR-H