

Seminar

From visualizing femtosecond electron bunches in hot, dense plasmas to visualizing chemistry with femtosecond electron bunches

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The first part of this talk will revolve around my doctoral work at TIFR, Mumbai and RAL, Oxford on the generation and transport of femtosecond, relativistic electron bunches through a hot, dense plasma, produced by the incidence of an intense, femtosecond laser on a solid. Unraveling the spatio-temporal dynamics of the hot electron transport opens a window to explore the plasma instabilities and magnetic turbulence in the laser-plasma, akin to astrophysical scenarios [1], as well as potential routes to curb the instabilities, resulting in long-range, collimated transport of the hot electrons [2]. The latter is envisaged to be of pivotal importance in inertial confinement fusion and laser-based ion-acceleration schemes.

The second part of the talk will briefly describe my ongoing postdoctoral work at MPD, Hamburg, towards making "molecular movies" of vibrationally-mediated laser-selective chemistry, using femtosecond electron diffraction.

References:

[1] G. Chatterjee et al., "Recreating astrophysical magnetic turbulence in a table-top laser-plasma", under review in *Nature Phys.*

[2] G. Chatterjee et al., "Macroscopic transport of megaampere electron currents in aligned carbon nanotube arrays", *Phys. Rev. Lett.* 108, 235005 (2012)."

Tuesday, Dec 6th 2016

4:00 PM (Tea/Coffee at 3:45 PM)

Seminar Hall, TCIS