European XFEL

SEMINAR

New starting time!!

Friday, 1st June 2012, 15:30

AER 19 / Room 3.11

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Creation and probing of high-energy-density matter using high-power laser-based sources

I will present my recent scientific activities that were performed using high-energy, high-intensity lasers. I have recently designed and developed a plasma-based re-focusing optics that focus the high-power laser down to the laser wavelength scale. This plasma device permits us to significantly enhance the focus intensity, by reducing the focus spot size, without modifying much the laser system itself. This approach has allowed us to improve the secondary MeV proton beam generation that could be used for ultrafast isochoric heating of matter or radiographic applications. We had probed an Al sample heated by this enhanced proton beam by a pico-second broadband X-ray source generated by another laser. We had observed the loss of short-range ordering through the progressive smoothing of the timeresolved X-ray absorption near-edge spectroscopy (XANES) structure. Continuation of this research is planned at the LCLS Linac Coherent Light Source. Also, we have recently installed a high-energy pulse generator to drive pulsed highfield magnets (20 T) into the LULI-ELFIE 100TW laser system in collaboration with T. Cowan's group in Helmholts-Zentrum Dresden-Rossendorf (HZDR). We observed striking collimation of laser-produced plasma jets by applying the magnetic fields. I'll also briefly present my skills in conducting and leading experiments on large-scale laser facilities.

Host: Thomas Tschentscher