

HiLASE Centre is pleased to invite you to attend the seminar

Extreme picosecond laser pulses for non-thermal opto-mechanical ignition of hydrogen-boron fusion

Heinrich Hora

University of New South Wales, Sydney, Australia

In order to avoid the $>100\text{MeV}$ temperatures for thermonuclear ignition of hydrogen H fusion with 11B (HB11 fusion), the now available picosecond laser pulses of more than 10 petawatt power permit the ignition at extreme non-LTE (local thermal equilibrium) conditions. In contrast to the classical heating, the nonlinear (ponderomotive) forces of the laser field provide the necessary pressures for ignition at comparable modest temperatures with energy gains higher than five orders of magnitudes, and additional four orders are due to the avalanche HB11 reaction. This result explains exactly the measurements of fusion energy gains at the PALS laser. Combining this with kilotesla magnetic fields for cylindrical trapping opens the design of environmentally absolute clean, low cost and lasting generation of electricity [1]. This modest temperature fusion is in fundamental contrast to the needed $>10\text{keV}$ temperatures for continuous fusion at low density magnetic field confinement.

[1] H. Hora, S. Eliezer et al. *Laser and Particle Beams* 35 (2017) 730; *IEEE Transact. Plasma Sc.* 46 (2018) 1191.

When: Monday 18/06/2018 at 10:00

Where: HiLASE Centre – Seminar room