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SEMINARS ON TECHNOLOGICAL ADVANCES AND INNOVATION

ULTRAFAST, ULTRA-INTENSE: ENGINEERING THE MOST EXTREME INTENSE LASERS ON THE PLANET

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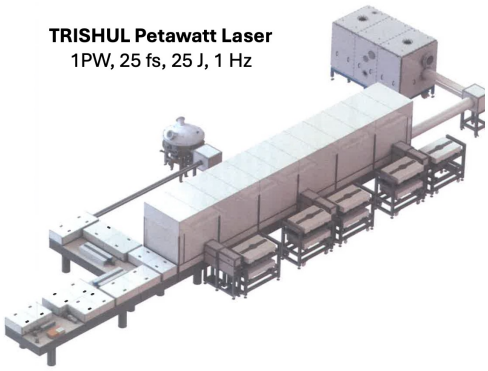

TRISHUL Petawatt Laser
1PW, 25 fs, 25 J, 1 Hz

Petawatt class lasers, capable of delivering quadrillions (>10^{15})of watts of power in ultra-short bursts, represent one of the most extreme achievements of modern optics. These complex laser systems exploit decades of fundamental advances made in the field ultrashort laser pulse generation, amplification, pulse compression, and optical engineering to generate light pulses which generate intensities rivaling those found in stellar environments. This ability to create these extreme intense environments have enabled us to push the boundaries of high-energy-density physics, particle acceleration, laboratory astrophysics, and next-generation light-matter interaction studies. In this talk, we will explore the scientific principles and technological innovations that make these petawatt lasers possible - from chirped pulse amplification (CPA) and gain media design to adaptive optics and the ultrafast diagnostics. With this broad foundation we will eventually discuss TIFR, Hyderabad's upcoming TRISHUL (TIFR Research Infrastructure for Studies in High intensity Ultrashort Lasers) Petawatt Laser – its design, architecture and working.

Aug | 7th | 2025

TIFRH Auditorium 16:00 Hrs

Tea/Coffee 15:45 Hrs