

9th Summer School

Plasmas in super-intense laser fields



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Basics of Laser-Plasma Physics for ICF

Lectures 1 and 2: Introduction to laser-plasma interaction (in the "moderate intensity" regime)

- Laser-plasma interaction regimes
- (Not-too intense) electromagnetic waves in an unmagnetized plasma: dispersion relation, propagation, collisional absorption
- Laser-solid interaction; laser-driven ablation: mechanism, scaling laws for absorption, ablation pressure, mass ablation rate
- Laser-driven acceleration; rocket model; hydrodynamic efficiency
- Classical Rayleigh and Rayleigh-Taylor instability (RTI): mechanism and linear growth rate
- RTI of laser-accelerated thin targets
- RTI of in ICF

Lecture 3: Inertial confinement fusion: a "preview"

- Fusion reactions for energy production
- ICF principles and basic requirements
- ICF by spherical implosion illustrated by simulations and movies
- Issue preview
- ICF schemes: many options