UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

SYLLABUS DEL CORSO

Principles of laser physics and non-linear optics

86R-XXXVI-PLPNLO

Aims

Contents

1. Basic principles of lasers: black-body radiation, stimulated and spontaneous emission, Einstein coefficients, semi-classical approach to radiation-matter interaction, population inversion, notion of gain, role of the optical cavity, Q switching, mode-locking, CPA technique, some "constructive" notions about lasers.
2. Lorentz-Drude model extended to the case of metals and uniaxial crystals. Anomalous dispersion and dispersion, evanescent waves, group velocity, oscillator forces, transition to quantum physics. Basic principles of nonlinear optics: second harmonic generation, self-focusing and filamentation, induced transparency and opacity, self-phase modulation ...

Detailed program

Prerequisites

Teaching form

1 CFU, 8 hours, language: Italian.

Textbook and teaching resource

Semester

II semestre

Assessment method

Office hours