Electromagnetic waves : optics and propagation in materials

ECTS
4 crédits

Hourly volume
50h

Introducing

Objectives

At the end of this module, the student will have understood and be able to explain the concepts of temporal and spatial coherences of two light sources, the interference and diffraction phenomena, the propagation of electromagnetic waves in simple material (linear, homogeneous and isotropic, dielectric, magnetic or conductive), the reflection and the refraction at one interface, the principle of rectangular metallic wave guides and of the electromagnetic energy transport.

The student will be able to calculate the interference patterns in the case of two Young slits and of diffraction grating, and the diffraction pattern in the case of rectangular aperture. He will also be able to use the Maxwell equation to determine the nature of the electromagnetic waves in a simple system (L.H.I. material, interface between two materials, confined space between two planes of conductive material).

Necessary prerequisites

Necessary knowledge :

Electromagnetism course (static and quasi-static)
Mathematical tools: complex number, vector field, differential calculus.

Practical info

Location(s)

📍 Toulouse