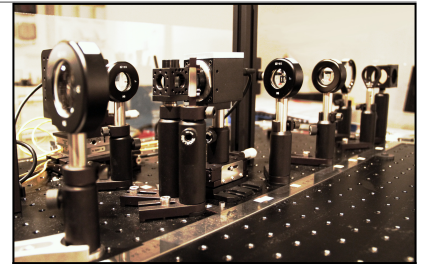


EF2 | Basics of optics



NIVEAU : BASIC

Publics : Engineers or senior technicians wishing to update their knowledge in optics or master the basics of optics

Prérequis : Basic knowledge in mathematics and geometry

Responsable(s) pédagogique(s) : Thierry Avignon - Responsable du LEnsE, chargé de cours à l'Institut d'Optique, Sébastien De Rossi - Enseignant-chercheur à l'Institut d'Optique

Langue de la formation : French

Capacité maximum : 12

Prix : 2960€ HT - **Durée :** 2 x 4 days - 56 h

Objectifs

- Understand the principles of optical systems
- Design and set up a simple optical assembly
- Participate in the elaboration of the specifications of an optical instrument

Dates et lieu des prochaines sessions

- ▶ 24 november 2020 au 27 november 2020 et 08 december 2020 au 11 december 2020 - Palaiseau

Thèmes abordés

Geometrical optics

- Reflection and refraction of light rays
- Notions of rigorous and approximate stigmatism
- Simple optical elements and their combinations

Optical instruments

- Genral properties of instruments
- Basic instruments (telescope, microscope, projection lens)
- Basics of photometry in optical systems

Physical optics

- Wave aspect of light.
- Interference and diffraction
- Polarization



EF2 | Basics of optics

Le programme

Geometrical optics

- Basic laws of light propagation - Reflection, refraction
- Approximation of linear optics (Gauss optics) - Mirrors, Lenses.
- Basic properties of the centered systems (focal, afocal, aperture)
- Experimental demonstrations: total reflection, image formation, imaging under Gauss conditions ...

Optical instruments

- General properties of optical instruments, examples
- Notion of focal length, magnification, angular magnification
- Pupil of an instrument, fields of view and depth of view
- Instrument Photometry Elements
- Experimental demonstrations: microscope, afocal telescope, projection lens

Physical optics

- Wave aspect, electromagnetic field, light vibration - Natural light, polarized.
- Interference: application to the characterization of optical system by interferometry.
- Diffraction and influence on the resolution of optical systems
- Influence of aberrations on the resolution of optical systems
- Experimental demonstrations: polarization, light interferences and diffraction, aberration

Labwork

- Paraxial measurements on optical systems - Image formation by lenses and mirrors
- Basic optical instruments: bezel, finder, collimator, microscope
- Measurement of geometric and chromatic aberrations
- Interferometric measurements on a Michelson, a Fizeau interferometer (Zygo)

Méthodologie et évaluation

Courses and exercises

Interactive experimental demonstrations

Labwork on instruments