



NANO-OPTIQUES

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Lecturers: **Christelle MONAT, Virginie MONNIER-VILLAUME**

| Lecturers : 0.0 | TC : 0.0 | PW : 16 | Autonomy : 2 | Study : 2 | Project : 0.0 | Language : FR

Objectives

This training will be devoted to the elaboration, of nano-optical devices using with particular diffraction/reflection properties due to their periodic structuration at the wavelength scale. Different kinds of periodic systems will be studied and elaborated using physical routes from thin films (clean room technology) and chemical routes (from colloidal dispersions). Their structural and optical properties will be simulated and characterized.

Keywords : Photonic crystals, thin films, nanostructured periodic systems, opals, simulation, spectroscopy.

Programme

BE (2h): periodic structures, photonic crystals and synthetic opals.
TP1 (4h): simulation of optical properties of photonic crystals.
TP2 (4h): elaboration of synthetic opales by chemical route.
TP3 (4h): fabrication of Bragg mirrors in the clean room.
TP4 (2h): optical characterization by reflectivity.
TP5 (2h): structural characterization by scanning electron microscopy.
Autonomy (2h).

Learning outcomes

- Understand the challenges and problematics of photonic crystals and the origin of periodic structures properties.
- Know and use clean room techniques, colloidal chemistry and structural/optical characterizations.
- Simulate optical properties of some photonic structures.

Independent study

Objectifs : Writing of the report.

Méthodes : Write a full technical report, with correct references.

Core texts

Assessment

30% for answer to theoretical questions, 30% for active involvement and participation, 40% for the report writing.