

Internship offered in M2 2017-2018

Responsible for internship

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Location:

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Internship topic: Design of QLED

Nanocrystals are used for the last three years as the new generation of light emitter for display. In current device the nanocrystals are optically pumped by a blue GaN LED. Next generation will have to be based on electrically pumped LED to reduce the electrical consumption and achieve darker black color.



Picture of nanocrystal solutions under UV illumination

The project aims to design a nanocrystal based light emitting diode. The project is very pluridisciplinary since the student will be involved at all step of the process : (i) from nanocrystal synthesis, (ii) LED fabrication which include work in clean room and under protective atmosphere (glove box) to (iii) the LED optoelectronic characterization.

As a first step we will work in the visible range of wavelength using robust core shell heterostructure of II VI semiconductor made of CdSe/ZnS. Then (during PhD) the goal will be to switch toward narrower band gap material to build infrared LED.

The device optimization will strongly involved the investigation of the electronic structure of these materials using photoemission measurement in particular at Soleil synchrotron)

The student will need a dual background both in chemistry and semiconductor physic..



Techniques involved: Main used technics are inorganic synthesis and the associated structural characterization (TEM, XRD, Clean room fabrication (lithography, evaporation) and glove box fabrication Electronic transport measurements (current and capacitive measurement and electro-optical characterization (spectroscopy) Electronic structure measurements (photoemission and UV vis and IR spectroscopy)

Type of internship: ~~theoretical, experimental,~~ mixed

Paid internship: Yes/~~No~~

Can this internship be continued for a PhD? Yes/~~No~~

If yes, type of PhD funding envisaged is: ERC (obtained) or Cifre