

## Monday 24th June :

**14h-18h : Nanocrystals/ligands-doping-impurity coupling :** How to improve and modulate in a controlled way the intrinsic properties of nanocrystals? What are the new properties (electronic, plasmonic) generated by this coupling? What is the influence on the electronic and optical properties (interface state, intrinsic state) ?

### Speakers :

- **Emmanuel Ihuillier** (INSP, Paris, France): *Doping of III-V and II-VI semiconductor nanocrystals, tuning of optoelectronic properties.*
- **Stefano Ossicini** (Modena Universita, Italie): *Theoretical modeling of doped semiconductor nanocrystals .*
- **Bruno Masenelli** (INL, Lyon, France) : *Doping of ZnO nanocrystals, tuning of plasmonic properties.*

## Tuesday 25th June :

### 08h30- 12h30 Nanocrystals coupled to nanostructures :

Interaction between plasmonic nanostructures and 2D materials (graphene, transition metal dichalcogenides). Study of the coupling between plasmons and 2D confined excitons. Coupling between the nanocrystals and their environment (magnetic, chemical, organic matrix) and probing of their electronic properties.

### Speakers :

- **Jérôme Plain** (LNIO, Troyes, France) : *Nanocrystals and nanostructures for plasmonics.*
- **Jan Linnros** (KTH, Stockholm) : *Optical spectroscopy of nanocrystals.*
- **Cyriaque Genet** (ISIS, Strasbourg) : to be announced.

### 14h00- 16h30 : Lab works

- *Simulation des propriétés de transport électroniques : blocage de Coulomb, Single electron transistor (J.F. Dayen, Y. Leroy).*
- *Simulation des propriétés optiques, plasmoniques, structure de bande : introduction aux méthodes d'éléments finis (FDTD) (J. Plain)*
- *Mesures par ellipsométrie et simulation de spectres optiques sur couches minces de nanocristaux enterrés (Thomas Easwarakhanthan, Otman En Naciri)*
- *Analyse de données de caractérisation structurales STEM-EELS (Xavier Devaux)*

**17h00-18h30 : Tables ronde « How to create a Start-up » : Vincent Bouchiat, Bertrand Kierren, more to be announced.**

## Wednesday 26th June

### 08h30- 12h30 Nanocrystals self-ordering and growth :

How to organize nanocrystals at the nanoscale in 1D, 2D or 3D heterostructures? What are the new approaches offered by the growth and self-organization of nanocrystals on 2D materials?

How can the properties (magnetic, electronic, optical) of these heterostructures be modified through the control of inter-nanocrystal or nanocrystal / matrix (or 2D template) coupling?

**Speakers :**

- Benoît Pichon (IPCMS, Strasbourg, France) : *Self-assembly and functionalization of nanocrystals : bottom-up approach.*
- Johann Coraux (Néel Institut, Grenoble, France) : *2D materials : a template for nanoclusters with uniform physical and chemical properties.*
- Veronique Dupuis (INL, Lyon, France) : *Physical growth of nanocrystals and their structural and magnetic properties in their environment*

**SOCIAL EVENT : Afternoon**

**Thursday 27th June :**

**08h30- 12h30 Multifunctional and Hybrid Nanomaterials :**

Chemical and physical synthesis strategies for nanocrystals-based multifunctional hybrid nanomaterials ? What are the physical properties emerging from interactions between distinct nanomaterials ?

**Speakers :**

- **Marcus Scheele** (Université de Tubingen, Allemagne) : *Coupled organic-inorganic nanostructures*
- **David Portehault** (LCMCP, Paris, France) : *Surface reactivity of nanoparticles and impact on properties*
- **Harald Giessen** (University of Stuttgart, Stuttgart, France) : *Multifunctional nanomaterial : new properties from interactions.*

**14h00-16h30 : Lab work**

- *Simulation des propriétés de transport électroniques : blocage de Coulomb, Single electron transistor (J.F. Dayen, Y. Leroy).*
- *Simulation des propriétés optiques, plasmoniques, structure de bande : introduction aux méthodes d'éléments finis (FDTD) (J. Plain)*
- *Mesures par ellipsométrie et simulation de spectres optiques sur couches minces de nanocristaux enterrés (Thomas Easwarakhanthan, Otman En Naciri)*
- *Analyse de données de caractérisation structurales STEM-EELS (Xavier Devaux)*

**17h00-18h30 : Tables ronde** « European projects and European Networks » : t.b.a

**Friday 28th June :**

**08h30-12h30 Experimental techniques to investigate nanomaterials interacting with their environment :**

State of the art and new tools for structural characterization of nanocrystals and their couplings, in particular using Transmission Electron Microscopy techniques and in particular their associated in-situ and in-operando spectroscopies.

**Speaker :**

- **Hervé Aubin** (C2N, Saclay, France) : *Electronic spectroscopy of nanocrystals.*

- **Mathieu Kociak** (LPS, Paris, France) : *Cathodoluminescence for nano-optics.*
- **Giancarlo Rizza** (LSI, Palaiseau, France) : *Gas and liquid environmental TEM.*