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Application for a postdoctoral position

Research Experience

2019–now **Research Engineer**, LCPO (Pessac), France.

Fabrication of multifunctional hybrid nanosystems

Supervisors: Dr. Olivier SANDRE (olivier.sandre@enscbp.fr)

In this project, I am aiming at the synthesis of metallic/metallic Au/IO hybrid nano-systems with magnetoplasmonic properties for hyperthermal cancer treatment applications. Other optical nanocomposite Au/polymer films are also developed for 3D-printing purposes, especially with the use of bio-sourced poly(citric acid) (PCA) as polymeric matrix.

2018–2019 **Post-Doctorate Project**, Cordouan Technologies (Pessac) and LCPO (Pessac), France.

Development of a new DLS device for the characterization of anisotropic nanoparticles and application over magnetic nanowires

Supervisors: Dr. David JACOB (david.jacob@cordouan-tech.com) & Dr. Olivier SANDRE (olivier.sandre@enscbp.fr)

In this project, I have developed a new commercial DLS set-up for the characterization of anisotropic nanoparticles, as part of an European project about the synthesis and characterization of magnetic nanowires and their application. As a side-project, I worked on inserting fluorescent and plasmonic noble metal-based nanoparticles into such magnetic nanowires for further optical characterization and the formation of multifunctional nano-hybrids.

2014–2017 **PhD Studies**, CRPP (Bordeaux) and LIONS (CEA-Saclay), France.

Towards self-assembled metamaterials made from block copolymers

Supervisors: Dr. Virginie PONSINET (ponsinet@crpp-bordeaux.cnrs.fr) & Dr. Patrick GUENOUN (patrick.guenoun@cea.fr)

In this project, I achieved the fabrication of nanocomposite films from the incorporation of gold nanoparticles *via* various physical and chemical processes into films made from self-assembled block copolymers. The preliminary optical measurements carried out over these nanocomposite materials confirmed their interest for optical applications.

2014 **Research Internship (6 months)**, Laboratoire de Physique et d'Étude des Matériaux, ESPCI, Paris (France).

Optimization of the synthesis of fluorescent colloidal semiconductor nanoparticles in order to improve their optical properties

Supervisor: Dr. Benoît DUBERTRET (benoit.dubertret@espci.fr)

During this internship, I studied the synthesis of fluorescent CdSE/CdS quantum dots and determined the specific influence of the shell-growth over their optical properties. I developed various shell-growth processes to synthesize almost-non-blinking quantum dots.

2013 **Research Internship (6 months)**, Dipartimento di Scienze Molecolari e Nanosistemi, Università Ca' Foscari, Venice (Italy).

Restoration of artifacts of archaeological interest and study of a new iron-corrosion inhibitor

Supervisor: Pr. Giuseppe MORETTI (bmor@unive.it)

For this project, I performed the restoration of various sub-marine artifacts by electrochemical means and ensure their conservation against further corrosion. I also developed the inorganic synthesis of a new iron-corrosion inhibitor.

2012 **Research Internship (2 months)**, *Laboratoire de Réactivité des Surfaces (LRS)*, Ivry-sur-Seine (France).

Study of a secondary phase in Ni²⁺ zeolites X

Supervisors: Dr. Pascale MASSIANI (pascale.massiani@upmc.fr) & Dr. Thomas ONFROY (thomas.onfroy@upmc.fr)

During this internship, I studied the parameters influencing the apparition of a secondary phase during the Ni²⁺/Na⁺ cation exchange reaction in zeolite X. Temperature and pH play a active role in the formation and cristallinity of this secondary phase, through the partial dissolution of the zeolite.

2011 **Research Internship (1 month)**, *Laboratoire des Matériaux Mésoscopiques et Nanométriques (LM2N) (currently MONARIS)*, UPMC, Paris (France).

Organometallic synthesis of silver nanoparticles

Supervisors: Dr. Alexa COURTY (alexa.courty@upmc.fr)

During this internship, I studied the influence of the ligand coming from the precursor salt over the size and shape of silver nanoparticles.

Teaching Experience

2020 **Lab' experiments with master's students about AuNP-containing polymer composite for 3D printing**, 8h.

ENSCBP – Pessac (France)

2020 **Supervision of 3rd-year bachelor project: "Fabrication and 3D printing of AuNP-containing polymer composites"**, 3 weeks.

ENSCBP – Pessac (France)

2020 **Lab' experiments with master's students about gold nanoparticle synthesis**, 16h.

ENSCBP and University of Bordeaux – Bordeaux (France)

2019 **Lab' experiments with master's students about gold nanoparticle synthesis**, 8h.

ENSCBP – Pessac (France)

2017 **Lab' experiments with master's students about gold nanoparticle synthesis**, 16h.

ENSCBP and University of Bordeaux – Bordeaux (France)

2016 **Workshop: Gold Nanoparticle Synthesis**, 6h.

Or-Nano Summer School – Agde (France)

Education

2014–2017 **PhD in Materials Chemistry**, *Université de Bordeaux*, Bordeaux (France).

2014 **Diploma of the ENS de Paris in Chemistry**, *ENS de Paris*, Paris (France).

Supplementary cursus: Sciences of Antiquity

2012–2014 **Master in Materials Chemistry and Physico-Chemistry**, *ENS de Paris and UPMC*, Paris (France).

2011–2012 **Bachelor in Chemistry**, *ENS de Paris and UPMC*, Paris (France).

2009–2011 **Preparatory School in Physic and Chemistry**, *Lycée Camille Guérin*, Poitiers (France).

2009 **Baccalauréat in Sciences**, *Lycée Polyvalent du Haut Val de Sèvres*, Saint Maixent-l'École (France).

Speciality: Engineering Sciences

Publications

Aubrit, F., R. Lewandowska, and D. Jacob

2020. Quantum dot size measurements with NIR dynamic light scattering. *Azonano*.

Aubrit., F., F. Testard, A. Paquirissamy, F. Gobeaux, X. Wang, F. Nallet, P. Fontaine, V. Ponsinet, and P. Guenoun

2018. Incorporation of plasmonic gold nanoparticles inside ordered block copolymer films. *Journal of Materials Chemistry C*, 6:8194 – 8204.

Patents

Aubrit, F., D. Jacob, and O. Sandre

2019. *Apparatus and method for determining characteristic parameters of nanoparticle dimensions.* Cordouan Technologies, CNRS, Univ. Bordeaux.

Communications

Oral

2019 ***Visible/NIR photothermia with gold bipyramids and nanostars.***

F. Aubrit, M. Bejko, C. Thérond, and O. Sandre

9^{ème} SFNano/C'Nano Joint Meeting – Dijon (France)

2019 ***Magneto-plasmonic filaments and anisotropy characterization with DDLS.***

F. Aubrit, D. Jacob, and O. Sandre

9^{ème} Colloque sur les systèmes anisotropes auto-assemblés – Sète (France)

2017 ***Gold Nanoparticles Incorporation into Organized Block-Copolymer Films.***

F. Aubrit, F. Testard, P. Guenoun, and V. Ponsinet

European Colloid and Interface Society (ECIS) – Madrid (Spain)

2017 ***Gold Nanoparticles Incorporation into Organized Block-Copolymer Films.***

F. Aubrit, F. Testard, P. Guenoun, and V. Ponsinet

GDR Or-Nano – Nancy (France)

2016 ***Incorporation of Plasmonic Gold Nanoparticles Organized in Ordered Copolymer Films.***

F. Aubrit, F. Testard, F. Gobeaux, P. Guenoun, and V. Ponsinet

Journée de Chimie du Grand Sud-Ouest – Bordeaux (France)

Posters

2019 ***Synthesis of Plasmonic/Magnetic Hybrid Nanochains.***

F. Aubrit, D. Jacob, and O. Sandre

6th Nano Today Conference – Lisbon (Portugal)

2017 ***Incorporation of Plasmonic Gold Nanoparticles Organized in Ordered Copolymer Films.***

F. Aubrit, F. Testard, F. Gobeaux, F. Nallet, P. Fontaine, P. Guenoun, and V. Ponsinet

12th SOLEIL Users' Meeting – Palaiseau (France)

2016 ***Study of Self-Assembled Block-Copolymer Films Containing Gold Nanoparticles via GISAXS.***

F. Aubrit, F. Testard, F. Gobeaux, F. Nallet, P. Fontaine, P. Guenoun, and V. Ponsinet

11th SOLEIL Users' Meeting – Palaiseau (France)

2016 ***In situ Formation of Plasmonic Gold Nanoparticles in Ordered Block Copolymer Films.***

F. Aubrit, F. Testard, F. Gobeaux, V. Ponsinet, and P. Guenoun

Or-Nano Summer School – Agde (France)

2015 **Towards Self-Assembled Metamaterials from Block Copolymers.**

F. Aubrit, F. Testard, V. Ponsinet, and P. Guenoun

Precision Polymer Materials (P2M) – Lacanau (France)

Scientific skills

Inorganic nanoparticle synthesis
Self-assembly in (co)polymers
TEM, AFM uses
UV and fluorescence spectroscopies
Synchrotron experience (GISAXS, GIWAXS)
Dynamic Light Scattering
3D printing

Languages

French **Native speaker**
English **Advanced**
Italian **Intermediate**
Spanish **Intermediate**
Russian **Basics**

Computer skills

LateX document writing and composition
IGOR environment for data treatment
ImageJ picture data treatment
Inkscape vector graphics editor
FreeCAD 3D drawing tool
Blender 3D computer graphics software

Interests

Capoeira
Tango
Drawing
Writing
Travels (South-East Asia, Middle-East, European cities)