

# The SFNano C'Nano joint meeting 2019

Nanomedicine • Nanotechnology • Nanoscience

**DIJON** December, 10, 11 and 12

Palais des congrès  
3 Boulevard de Champagne  
21000 Dijon



Organized by  





Sponsored by



















In partnership with













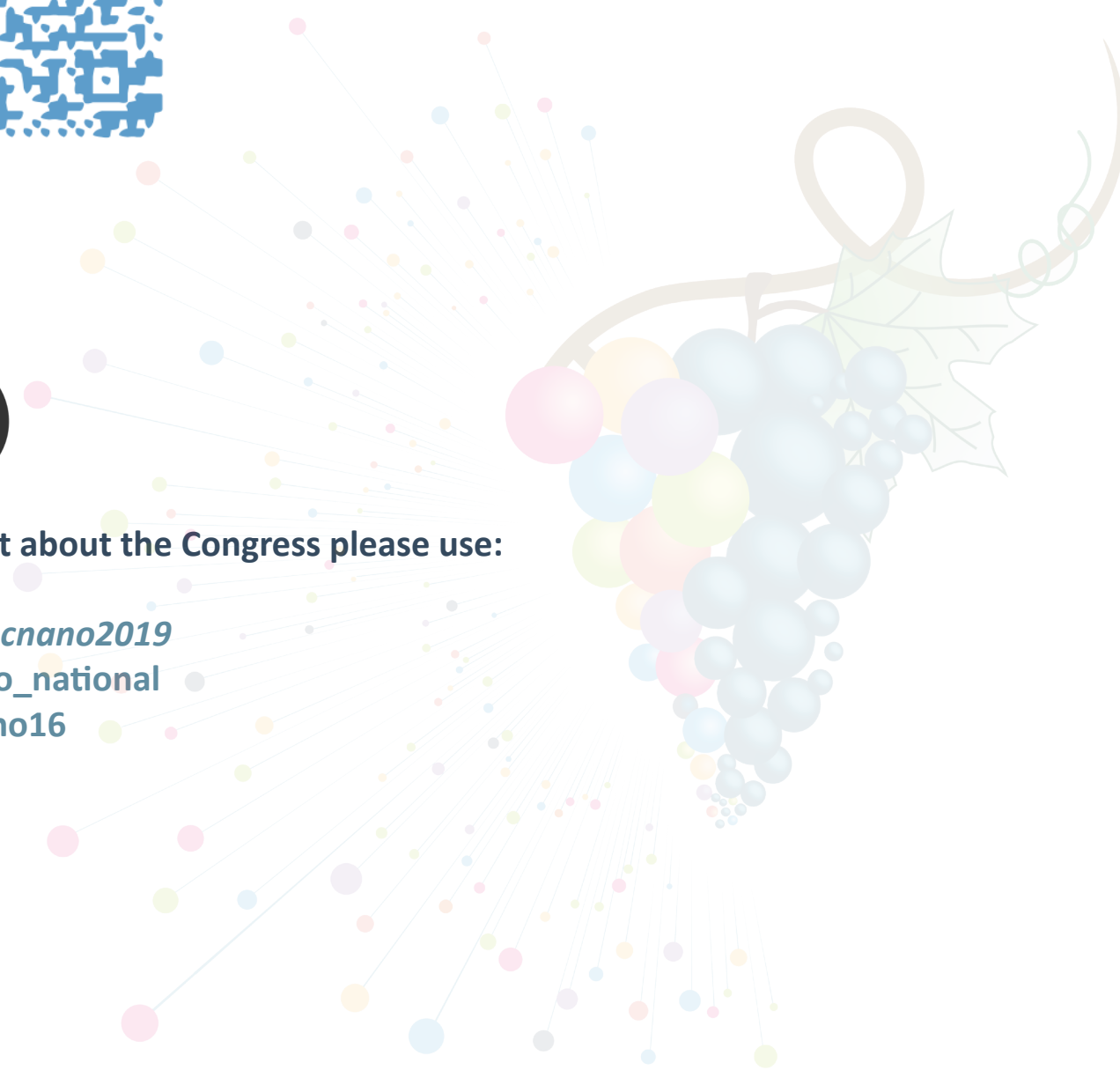



For more information about the SFNano C’Nano joint meeting 2019,  
scan the QR Code below !



To tweet about the Congress please use:

*#sfnanocnano2019*  
*@CNano\_national*  
*@SFNano16*



# Table of content

---

---

Organizers .....	p.4
Sponsors & partners .....	p.5
Organizing & scientific committees .....	p.6
Program	
General program .....	p.12
List of oral presentations .....	p.16
Abstract of invited speakers	
Plenary speakers .....	p.28
Keynote speakers .....	p.32
Satellite events	
Public Roundtable .....	p.56
Course on safer by design .....	p.57
PhD Thesis awards .....	p.60
List of posters .....	p.64
General information .....	p.72

# Organizers

## Forewords

Dear colleagues, dear friends,

It is our great pleasure to welcome you to the SFNano-CNano joint meeting 2019 ! This congress will offer the first ever interdisciplinary scientific program gathering all research groups working from physics to medicine in the “nano” field in France.

C’Nano and SFNano have seized the opportunity to join their force to propose you this unique interdisciplinary scientific event organized by researchers themselves thus ensuring high scientific quality. This joint meeting is dedicated to promoting exchanges and the emergence of interdisciplinary research projects in new areas between worldwide recognized research teams and scientists, and aims at pushing the boundaries of the nano world.

Your numerous presence at this event shows that “nano” is a very important field in France from physics, to chemistry going towards pharmacy and medical applications, with a high potential to reach new knowledge and novel applications.

Tremendous speakers have been invited in every sessions. We would like to thank them all to have accepted our invitation as well all our faithful or new partners and sponsors.

We hope that our involvement and devotion will be of great help and interest to our community today and in the future.

We wish you a fruitful conference and we hope that you will enjoy the scientific program!

Corinne Chaneac,  
Director of C’Nano



Nathalie Mignet,  
President of SFNano



SFNano, the French Society for Nanomedicine, is a non profit-making organization whose aim is to promote the advancement and dissemination of knowledge in the field of nanomedicine and to stimulate exchanges among the main players from academia and industry in France while reaching out across borders to our European neighbours in collaboration with European nanomedicine societies. In line with its multidisciplinary nature, SFNano gathers researchers from academia, public research centres (CNRS, INSERM) and industry.

SFNano annual meeting is a major event for the national and international nanomedicine community featuring numerous plenary conferences by internationally-known invited speakers as well as selected oral communications and posters.



C’Nano, the National Competency Cluster in Nanoscience, is a CNRS service unit promoting research in nanoscience.

C’Nano structures the French scientific community in “nano” by gathering physicists, chemists, engineers, biologists, physicians, sociologists, economists, jurists, etc. within a national pluridisciplinary network. C’Nano main missions include: promoting interdisciplinary research at the regional and national levels, supporting education and science-society exchanges, stimulating public/private partnerships and technological transfer, and finally implementing prospective studies to sustain the development of nanoscience and nanotechnology.

Through these missions, C’Nano aims at contributing to the emergence of common responses to scientific, economic and societal challenges in nanoscience.

# Sponsors & Partners

## Sponsors



## Partners



## With the local contribution of



# Organizing committee

## NATIONAL ORGANIZING COMMITTEE

### C'Nano

**Corinnne CHANEAC**

C'Nano Director (Sorbonne University – LCMCP)

**Julie CARIMALO**

C'Nano Scientific & Administrative Coordinator  
(CNRS)

**Christophe DECILAP**

C'Nano Administrative Officer (CNRS)

**Juan Ariel LEVENSON**

C'Nano Ile-de-France (CNRS – C2N)

**Nadine MILLOT**

C'Nano East Board (University of Bourgogne – ICB)

**Marieke MOREL**

C'Nano Communication Officer (CNRS)

### SFNano

**Nathalie MIGNET**

President of SFNano (CNRS – UTCBS)

**Sylvie BEGU**

SFNano board member (Montpellier University – ICGM)

**Amanda SILVA BRUN**

SFNano board member (CNRS – MSC)

**Elisabeth GARANGER**

SFNano board member (CNRS – LCPO)

**Lucie SANCEY-GALLIOT**

SFNano board member (CNRS – IAB)

**Nicolas TSAPIS**

SFNano board member (CNRS – IGPS)



## C'NANO LOCAL ORGANIZING COMMITTEE

**Nadine MILLOT**

C'Nano East Board (University of Bourgogne – ICB)

**Coralie FEVRE**

(University of Bourgogne – ICB)

**Cloë VAUTRIN**

(CNRS – ICB)

**Odile CHAMBIN**

(University of Bourgogne – PAM)

**Franck DENAT**

(University of Bourgogne – ICMUB)

**Bruno DOMENICHINI**

(University of Bourgogne – ICB, EIPHI Graduate School)

**Michel VERGNAT**

(University of Lorraine – IJL)

*With the support of M1 students from the Master Control and Durability of Materials, EUR EIPHI (Univ. Bourgogne Franche-Comté) and of the Communication service of CNRS regional delegation Centre-Est.*



# Scientific committees

## SFNANO & C'NANO COMMON SESSIONS

### Nanochemistry: synthesis & functionalization of nanosystems for bioapplications

**Sylvie BEGU**, SFNano board member, University of Montpellier – ICGM (Montpellier)  
**Ariane BOUDIER**, SFNano Treasurer, University of Lorraine – CITHEFOR (Nancy)  
**Franck DENAT**, University of Bourgogne – ICMUB (Dijon)  
**Elisabeth GARANGER**, SFNano board member, CNRS – LCPO (Bordeaux)  
**Nadine MILLOT**, East C'Nano board, University of Bourgogne – ICB (Dijon)  
**Nathalie MIGNET**, President of SFNano, CNRS – UTCBS (Paris)  
**Stéphane MORNET**, CNRS – ICMCB (Bordeaux)

### Nano-objects in biological fluids: from detection of endogenous vesicles to nanotoxicity of exogenous nanoparticles

**Tsiala BENARD**, Sanofi  
**Nadine MILLOT**, East C'Nano board, University of Bourgogne – ICB (Dijon)  
**Stéphane MORNET**, CNRS – ICMCB (Bordeaux)  
**Chantal PICHON**, SFNano board member, CNRS – CBM (Orléans)  
**Nicolas TSAPIS**, SFNano board member, CNRS – IGPS (Paris)

### Nano for imaging, diagnosis & theranostics

**Nicolas BONOD**, PACA C'Nano board, CNRS – Fresnel Institute (Marseille)  
**Jean-Luc COLL**, SFNano Vice-President, INSERM – IAB (Grenoble)  
**Fabienne GAUFFRE**, North-Western C'Nano board, CNRS – ISCR (Rennes)  
**Andreas REISCH**, University of Strasbourg – LBP (Strasbourg)  
**Lucie SANCEY**, SFNano board member, CNRS – IAB (Grenoble)  
**Nicolas TSAPIS**, SFNano board member, CNRS – IGPS (Paris)

## SFNANO SPECIFIC SESSIONS

### Nanoparticles & targeting

**Sylvie BEGU**, SFNano board member, University of Montpellier – ICGM (Montpellier)  
**Jean-Luc COLL**, SFNano Vice-President, INSERM – IAB (Grenoble)  
**Bernard LEBLEU**, SFNano board member, University of Montpellier – DIMNP (Montpellier)  
**Nathalie MIGNET**, President of SFNano, CNRS – UTCBS (Paris)

### Bio-inspired nanosystems

**Amanda SILVA BRUN**, SFNano board member, CNRS – MSC (Paris)  
**Elisabeth GARANGER**, SFNano board member, CNRS – LCPO (Pessac)  
**Nathalie MIGNET**, President of SFNano, University of Paris, CNRS – UTCBS (Paris)  
**Chantal PICHON**, SFNano board member, CNRS – CBM (Orléans)



**Nanoscience for Cancer**  
In partnership with Cancéropole Est

**Tsiala BENARD**, Sanofi  
**Amanda SILVA BRUN**, SFNano board member, CNRS – MSC (Paris)  
**Bernard LEBLEU**, SFNano board member, University of Montpellier – DIMNP (Montpellier)  
**Marie-Pierre ROLS**, SFNano Secretary, CNRS – IPBS (Toulouse)

## C'NANO SPECIFIC SESSIONS

### Nanophotonics & nano-optics

**Yannick DE WILDE**, CNRS – Langevin Institute (Paris)  
**Florent BABOUX**, University of Paris – MPQ (Paris)  
**Sébastien BIDAULT**, CNRS – Langevin Institute (Paris)  
**Benoit CLUZEL**, University of Bourgogne – ICB (Dijon)  
**Erik DUJARDIN**, CNRS – CEMES (Toulouse)  
**Christian GRILLET**, CNRS – INL (Lyon)  
**Virginie PONSINET**, CNRS – CRPP (Bordeaux)

### Nanomaterials

**Frédéric BERNARD**, University of Bourgogne – ICB (Dijon)  
**Corinne CHANEAC**, Ile-de-France C'Nano board, Sorbonne University – LCMCP (Paris)  
**Fabienne GAUFFRE**, North-Western C'Nano board, CNRS – ISCR (Rennes)  
**Bruno MASENELLI**, Auvergne-Rhône-Alpes C'Nano board, INSA Lyon – INL (Lyon)

### Surface and interface & the nanoscale

In partnership with Club nanoMétrologie

**Xavier BOUJU**, C'Nano Great South-Western board, CNRS – CEMES (Toulouse)  
**Frédéric CHERIOUX**, CNRS – FEMTO-ST (Besançon)  
**Yannick FAGOT-REVURAT**, University of Lorraine – IJL (Nancy)  
**Guillemin RODARY**, CNRS - C2N (Palaiseau)

### Solar energy

In partnership with GDR solar fuels

**Vincent ARTERO**, CEA – LCBM (Paris)  
**Jean-Francois GUILLEMOLES**, CNRS – IPVF (Gif-sur-Yvette)  
**Valérie KELLER**, CNRS – ICPEES (Strasbourg)  
**Gabriel LOGET**, CNRS - ISCR (Rennes)

### Nanoconfined liquids & gases

In partnership with Groupe Français des Zéolithes (GFZ)

**Christophe YBERT**, CNRS – ILM (Lyon)  
**Jean-Pierre BELLAT**, University of Bourgogne – ICB (Dijon)  
**Jean LE BIDEAU**, University of Nantes – IMN (Nantes)

### Nanoplastics & Nanocomposites

**Laurent CHAZEAU**, INSA de Lyon – MATEIS (Lyon)  
**Fabienne LAGARDE**, University of Mans – IMMM (Le Mans)  
**Didier STUERGA**, University of Bourgogne – ICB (Dijon)

### Nanosafes by design

In partnership with LabEx Serenade

**Mélanie AUFFAN**, CNRS – CEREGE (Aix-en-Provence)  
**Bernard CATHALA**, INRA – BIA (Nantes)  
**Jérôme ROSE**, CNRS - CEREGE (Aix-en-Provence)





# PROGRAM

# General Program

Plenary and keynote speakers

## Tuesday, December 10<sup>th</sup>

08:00 Registration and Welcome coffee

09:00 **OPENING SESSION**

**Corinne CHANEAC**, Director of C'Nano & **Nathalie MIGNET**, President of SFNano  
**Jean SUISSE**, Vice-President of Bourgogne University & **Alain DEREUX**, Director of ICB Laboratory

09:15 **PLENARY SESSION**

Ashutosh CHILKOTI, Professor at Duke university, USA

10:00 **SPONSORS PRESENTATIONS** Horiba, Fujifilm Visualsonics, Superbranche, Malvern, MR Solutions

10:25 Coffee break, Poster session & Exhibition

10:45

### THEMATIC SESSIONS

Nanochemistry: synthesis and functionalization of nanosystems for bioapplications

**Yannick GUARI**

CNRS - ICGM, France

Nano-optics & nanophotonics 1

**Stéphane BERCIAUD**

Univ. of Strasbourg, IPCMS, France

12:45 Lunch, Poster session & Exhibition

14:15

### THEMATIC SESSIONS

Nanochemistry: synthesis and functionalization of nanosystems for bioapplications

**Tanja WEIL**

MPI for polymer Research,  
Germany

Nanomaterials 1

**Thierry GACOIN**

CNRS - LPMC, France

Nano-optics & nanophotonics 1

**Alexandre BOUHELIER**

CNRS - ICB,  
France

Solar energy: Photocatalysis & photovoltaïcs

**Hynd REMITA**

CNRS - LCP, France

15:30 Coffee break, Poster session & Exhibition

16:00

### THEMATIC SESSIONS

Nanoparticles & targeting

**Tomas ETRYCH**

IMC Institute of the Czech Academy of  
Sciences, Czech Republic

Nanomaterials 1

Nano-optics & nanophotonics 1

Solar energy: Photocatalysis & photovoltaïcs

**Philip SCHULZ**

CNRS - IPVF,  
France

18:30 **PUBLIC ROUNDTABLE DISCUSSION** (Satellite event in french)

Welcome by **Denis HAMEAU**, Dijon Metropole Representative & **Marie-Guite DUFAY**, President of BFC Region  
**Fabien THOMAS**, CNRS Scientific Deputy Director for BFC Region

**Elias FATTAL**

Univ. Paris Sud - IGPS, France

**Claire AUPLAT**

Paris Dauphine Univ. - DRM, France

**Lauriane D'ALENÇON**

Solvay, France

20:30 Welcome cocktail, Poster session & Exhibition

Animation workshop: Serious game on cleanrooms - **Nathalie LIDGI-GUIGUI**, Univ. Paris Nord - LSPM, France

# Wednesday, December 11<sup>th</sup>

8:30

## PLENARY SESSION

**Romain QUIDANT**, *Professor at ICREA - ICFO Institute, Spain*

9:15

## SPONSORS PRESENTATIONS

ANR, LabEx NanoSaclay, Izon, V-Micro, SPECS, Cordouan, Anton Paar

10:20

Coffee break, Poster session & Exhibition

10:45

## THEMATIC SESSIONS

Nano-objects in biological fluids: from detection of endogenous vesicles to nanotoxicity of exogenous nanoparticles

**Lea Ann DAILEY**

*Philips Univ., Germany*

**Wilfrid BOIREAU**

*CNRS - FEMTO-ST, France*

Nano-optics & nanophotonics 2

**Natalia DEL FATTI**

*Claude Bernard Univ. - ILM, France*

13:15

Lunch, Poster session & Exhibition

14:30

## THEMATIC SESSIONS

Bio-inspired nanosystems

**Sébastien LECOMMANDOUX**

*Bordeaux INP - LCPO, France*

**Maria José BLANCO-PRIETO**

*Univ. Navarre, Spain*

Nanoplastics & nanocomposites

**Eliane ESPUCHE**

*Claude Bernard Univ. - IMP, France*

Nano-optics & nanophotonics 2

**Fabrice RAINERI**

*Univ. Paris - C2N, France*

Surface, Interface & Nanoconfinement 1

**Anne-Sophie DUWEZ**

*Liège University - NanoChemistry & Molecular Systems Laboratory, Belgium*

16:30

Coffee break, Poster session & Exhibition

17:00

## C'NANO - SFNANO PHD AWARDS 2019 CEREMONY

18:15

## YOUNG RESEARCHERS SESSION

20:30

Gala dinner at Château de Marsannay Castle

Departure by buses at 19:00

Romanée-Conti Amphitheater

Santenay-Chablis room

Givry-Savigny room

Morey-St-Denis room

# General Program

Plenary and keynote speakers

## Thursday, December 12<sup>th</sup>

08:30

### PLENARY SESSION

**Nathalie KATSONIS**, *Professor at University of Twente, Netherlands*

09:30

### THEMATIC SESSIONS

*Coffee break, Poster session & Exhibition: 10:30 - 11:00*

Nano for imaging, diagnosis  
and theranostics

**Hatice ALTUG**

*EPFL – BioNanoPhotonic Systems  
Laboratory, Switzerland*

**Kevin BRAECKMANS**

*Ghent University, Belgium*

Nanomaterials 2

**Corine GERARDIN**

*CNRS - ICGM, France*

12:30

Lunch & poster session

14:00

### THEMATIC SESSIONS

Nanoscience for Cancer

Surface, Interface &  
Nanoconfinement 2

**Denis MORINEAU**  
*CNRS - IPR, France*

Nanosafer by  
design

**Sébastien ARTOUS**  
*CEA - PNS, France*

16:30

### BEST TALKS AND POSTERS AWARDS CEREMONY

17:00

### CLOSING SESSION



# Friday, December 13<sup>th</sup>

**09:00** **Course on « Safer by design »** (satellite event in French)  
Satellite event at **ESIREM Dijon Engineer School**  
*In partnership with LabEx SERENADE and Master C’Nano*  
*Look at the detailed program page 57*



**12:30** **Lunch**



## Legend for the rooms

 Romanée-Conti Amphitheater

 Morey-St-Denis room

 Givry-Savigny room

 Santenay-Chablis room

Coffee breaks, poster sessions & exhibitions, lunches and cocktail dinner will take place in the Hall des Grands Echézéaux



# List of Oral Presentations

## Tuesday, December 10<sup>th</sup>

### 09:00 **OPENING SESSION**

**Corinne CHANEAC**, Director of C'Nano & **Nathalie MIGNET**, President of SFNano  
**Jean SUISE**, Vice-President of Bourgogne University & **Alain DEREUX**, Director of ICB Laboratory

### 09:15 **PLENARY SESSION**

Ashutosh CHILKOTI, Duke university, USA - **Molecular Engineering of Nanoscale Polymer Interfaces and Nanoparticles for Diagnostics and Drug Delivery**

**10:00 **SPONSORS PRESENTATIONS**** Horiba, Fujifilm Visualsonics, Superbranche, Malvern, MR Solutions

**10:25** Coffee break, Poster session & Exhibition

### 10:45 **THEMATIC SESSIONS**

#### **NANOCHEMISTRY: SYNTHESIS AND FUNCTIONALIZATION OF NANOSYSTEMS FOR BIOAPPLICATIONS**

10:45	Iron oxide nanoparticles and nanocomposites: their biosafety and applications	<b>Yannick GUARI</b> • CNRS - ICGM, France
11:15	Heterotelechelic polymer prodrug nanoparticles for imaging and combination therapy	<b>Julien NICOLAS</b> • CNRS - IGPS, France
11:30	Soft fluorescent organic nanodots as novel nanocarriers for photoactivated drugs	<b>Mireille BLANCHARD-DESCE</b> • CNRS - ISM, France
11:45	Sepiolite as a new nanocarrier for DNA transfer into mammalian cells	<b>Olivier PIETREMENT</b> • CNRS - ICB, France
12:00	Antifouling zwitterionic nanoparticles surface chemistry: impact on intracellular diffusion	<b>Nicolas LEQUEUX</b> • ESPCI - LPEM, France
12:15	Hyaluronic acid modified stimuli responsive nanoconjugates for multimodal therapy of glioblastoma	<b>Abhijeet PANDEY</b> • Dpt of pharmaceuticals - MCOPS, India
12:30	Shape, fonctionnalisation and defect effects on theranostic anisotropic nano-objects coated with antifouling dendrons	<b>Geoffrey COTIN</b> • Univ. Strasbourg - IPCMS, France

**12:45 Lunch, Poster session & Exhibition**

#### **NANO-OPTICS & NANOPHOTONICS 1**

10:45	Atomically thin heterostructures made from graphene and transition metal dichalcogenides: an emerging class of photonic...	<b>Stéphane BERCIAUD</b> • Univ. Strasbourg - IPCMS, France
11:15	Dispersion trimming for mid-infrared supercontinuum via chalcogenide deposition on a silicon-germanium waveguide	<b>Milan SINOBAD</b> • RMIT - INL, France
11:30	Assembled hybrid chiral plasmonic metasurfaces	<b>Wu WENBING</b> • ICS, France
11:45	Saturable absorption of nonlinear graphene coated Si3N4 waveguides	<b>Pierre DEMONGODIN</b> • ECL - INL, France
12:00	Surface functionalization of silicon with rare earth ions for optical applications	<b>Kathleen TOUSSAINT</b> • Univ. Lorraine - ICMR, France
12:15	Quantifying single nanorod magnetic dipole emission by Fourier microscopy	<b>Reinaldo CHACON</b> • Univ. Bourgogne - ICB, France
12:30	Synthesis and characterization of III-V based quantum dots for light emission	<b>Rodolphe VALLEIX</b> • UCA - ICCF, France

**12:45 Lunch, Poster session & Exhibition**

Romanée-Conti Amphitheater

Santenay-Chablis room

Givry-Savigny room



**14:15****THEMATIC SESSIONS****NANO-OPTICS & NANOPHOTONICS 1**

14:15	Transducing electrons and photons in atomic-scale optical feed	Alexandre BOUHELIER • CNRS - ICB, France
14:45	Subwavelength Polarization Optics Using Individual and Coupled Helical Travelling-Wave Nanoantennas	Thierry GROSJEAN • CNRS - FEMTO-ST, France
15:00	Proposal for a spiking nanolaser	Maxime DELMULLE • Univ. Paris Sud/Paris Saclay - Thales & C2N, France
15:15	Remote Generation of Hot-Electron assisted by Surface Plasmon Polaritons	Romain HERNANDEZ • ICB, France

**15:30 Coffee break, Poster session & Exhibition**

16:00	Plasmon-triggered living photopolymerization for elaboration of hybrid polymer/metal nanoparticles	Farid KAMECHE • IS2M - Univ. Pierre et Marie Curie, France
16:15	Engineering of gold-polymer long-range plasmonic waveguides as single-mode optical interface chips	Laurent MARKEY • CNRS - ICB, France
16:30	Controlling the coupling between organic emitters and surface modes of metallic nanoparticles gratings for efficient organic...	Sarah HAMDAD • Univ. Paris 13 - LPL, France
16:45	Resonance Raman spectroscopy of Nano-designed assembly	Bernard HUMBERT • Univ. Nantes - IMN, France
17:00	Sensors for near-field microscopes based on micro-/nano-systems and their application to THz imaging at the nanoscale	Marc FAUCHER • CNRS - IEMN, France
17:15	Quasinormal mode expansion for nonlinear nano-optics	Carlo GIGLI • Univ. Paris - MPQ, France
17:30	Improving Nano-Theranostic Studies with Multi-Modal Raman and Enhanced Darkfield Hyperspectral Microscopy	Samuel M. LAWRENCE • Cytoviva Inc, USA

**SOLAR ENERGY: PHOTOCATALYSIS & PHOTOVOLTAÏCS**

14:15	Conjugated Polymer Nanostructures for Photocatalysis under Visible-Light	Hynd REMITA • CNRS - LCP, France
14:45	Highly selective plasmonic CO <sub>2</sub> photoreduction with water over gold-containing photocatalysts	Valérie CAPS • CNRS - ICPEES, France
15:00	One-pot Sol-Gel Self-biotemplating Assembly of Metal Oxides: Original approach for Photocatalyst	Cong WANG • Paris Sud Univ. - LCP - France
15:15	Surface Nanostructuring and Functionalization for Efficient Water Photooxidation	Lionel SANTINACCI • CNRS - ClnAm, France

**15:30 Coffee break, Poster session & Exhibition**

16:00	Interfaces and stability of halide perovskite semiconductors	Philip SCHULZ • CNRS - IPVF, France
16:30	BiVO <sub>4</sub> photoanodes prepared by alkaline electrodeposition, enhanced with Fe co-catalysts for solar water splitting	Hiba SAADA • Univ. Rennes 1 - MACSe, France
16:45	Alloying of pure sulphide Kesterite in semi-transparent solar cells: towards the tandem integration with crystallin silicon	Charif TAMIN • Univ. Bourgogne - ICB, France
17:00	Study of Photovoltaic Cells based on Nanomaterials	Mourad HOUABES • ESTI, Algeria
17:15	Achieve rectification of current by ferrocenyl triazole derivates	Damien BRUNEL • Aix-Marseille Univ. - ICR, France

# List of Oral Presentations

Tuesday, December 10<sup>th</sup>

14:15

## THEMATIC SESSIONS

### NANOCHEMISTRY: SYNTHESIS AND FUNCTIONALIZATION OF NANOSYSTEMS FOR BIOAPPLICATIONS

14:15	Biomaterials inspired by Nature to solve Medical Challenges	Tanja WEIL • MPI for Polymer Research, Germany
14:45	Morphology Control and Electronic Confinement within Photoactive Organic Nanoparticles for Bioimaging and Drug Release	Elena ISHOW • Univ. Nantes - CEISAM, France
15:00	One-pot synthesis of a new generation of hybrid bisphosphonate polyoxometalate gold nanoparticles as antibiofilm agents	Somia TOMANE • UVSQ - ILV, France
15:15	Magneto and photoresponsive nanoplatfoms based on mesoporous silica for nanomedicine applications	Damien MERTZ • CNRS - IPCMS, France

### NANOMATERIALS 1

14:15	Microstructure issues in the design of colloidal oxide nanoparticles	Thierry GACOIN • CNRS - LPMC, France
14:45	Composite magnetic nanoparticles of Fe <sub>3</sub> O <sub>4</sub> /CoO with different shapes exhibiting exchange bias	Clémentine BIDAUD • IMDEA Nanociencia, Spain
15:00	Dirac antidot superlattices for electrons in III-V semiconductors	Nathali Alexandra FRANCHINA VERGEL • IEMN, France
15:15	Mastering size, shape and composition of iron oxide nanoparticles by precursors design	Sylvie BEGIN • Univ. Strasbourg - IPCMS, France

### 15:30 Coffee break, Poster session & Exhibition

16:00	Molecular "LEGO-like" assemblage, characterization and application of functional block/branched polyamphiphiles	Alexander ZAICHENKO • Lviv Polytechnic National Univ., Ukraine
16:15	Mixing time between organometallic precursor and ligand: a key parameter controlling ZnO nanoparticle size and shape...	Myrtil KAHN • CNRS - LCC, France
16:30	Gadolinium-based contrast agents: from gadolinium complexes to colloidal systems	Jean-Daniel MARTY • Univ. Toulouse P. Sabatier - IMRCP, France
16:45	Copper complexes functionalized Au nanoparticles for plasmon assisted catalysis	Gennaro PICARDI • Univ. Nantes - CEISAM, France
17:00	Innovative Surface Plasmon Resonance (SPR) biosensor based on high refractive index nanoparticles assembled on a gold thin film	Pier Andrea BERLING • Univ. Strasbourg - IPCMS, France
17:15	Synergy between Surface Plasmon Resonance and Switching Properties in Gold@Spin Crossover Nano-Composite	Marlène PALLUEL • Univ. Bordeaux - ICMCB, France
17:30	Probing elasticity of an assembly of nanoparticles with ultrafast nano-optoacoustics methods	Gwenaëlle VAUDEL • CNRS - IMMM, France

Romanée-Conti  
Amphitheater

Morey-St-Denis  
room

16:00

## THEMATIC SESSIONS

### NANOPARTICLES & TARGETING

16:00	Targeted polyHPMA-based nanomedicines for cancer and inflammatory treatment	<b>Tomas ETRYCH</b> • <i>Institute of Macromolecular Chemistry CAS, Czech Republic</i>
16:30	A new painkiller nanomedicine to by-pass the blood-brain barrier and the use of morphine	<b>Sinda LEPETRE-MOUELHI</b> • <i>Univ. Paris Sud - IGPS, France</i>
16:45	Nanoparticles to remote-control TRAIL-induced cell death in cancer cells	<b>Olivier MICHEAU</b> • <i>INSERM - LNC, France</i>
17:00	Use of microfluidic technology to prepare nano/micro particles for diagnostic and therapeutic applications	<b>Samir CHERKAOUI</b> • <i>Bracco Suisse, Switzerland</i>
17:15	Perivascular drug delivery system for prevention of vein graft failure	<b>Tamara MELNIK</b> • <i>Institut des Sciences Pharmaceutiques de Suisse Occidentale, Switzerland</i>
17:30	Novel synthetic routes for small and defined gold nanoparticle-nanobody conjugates	<b>Nadja GROYSBECK</b> • <i>Univ. Strasbourg - BSC, France</i>
17:45	Hybrid liposomes for temoporfin delivery to the tumor tissue	<b>Ilya YAKAVETS</b> • <i>Belarusian State Univ. - Biophysics &amp; Biotechnology Lab., Belarus</i>
18:00	Magnetic Molecularly Imprinted Polymer for Cancer Therapy	<b>Nebewia GRIFFETE</b> • <i>Sorbonne Univ. - PHENIX, France</i>

### 18:30 PUBLIC ROUNDTABLE DISCUSSION (Satellite event in french)

Welcome by **Denis HAMEAU**, *Dijon Metropole Representative* & **Marie-Guite DUFAY**, *President of BFC Region*  
**Fabien THOMAS**, *CNRS Scientific Deputy Director for BFC Region*

**Elias FATTAL**  
*Univ. Paris Sud - IGPS, France*

**Claire AUPLAT**  
*Paris Dauphine Univ. - DRM, France*

**Lauriane D'ALENÇON**  
*Solvay, France*

### 20:30 WELCOME COCKTAIL, POSTER SESSION & EXHIBITION

Animation workshop: Serious game on cleanrooms « La Fabrique du nano »

**Nathalie LIDGI-GUIGUI**, *Univ. Paris Nord - LSPM, France*



© Christophe Finot

# List of Oral Presentations

## Wednesday, December 11<sup>th</sup>

### 08:30 **PLENARY SESSION**

**Romain QUIDANT**, *ICREA - ICFO Institute, Barcelona* - **Putting nano-optics to work!**

**10:00 **SPONSORS PRESENTATIONS**** ANR, LabEx NanoSaclay, Izon, V-Micro, SPECS, Cordouan, Anton Paar

**10:25** Coffee break, Poster session & Exhibition

**10:45**

### **THEMATIC SESSIONS**

#### **NANO-OBJECTS IN BIOLOGICAL FLUIDS: FROM DETECTION OF ENDOGENOUS VESICLES TO NANOTOXICITY OF EXOGENOUS NANOPARTICLES**

10:45	Nanomedicine Toxicology for Sensitive Administration Routes	<b>Lea Ann DAILEY</b> • <i>Dpt of Pharmaceutical Technology &amp; Biopharmacy, Austria</i>
11:15	Small Silica Nanoparticles Transiently Modulate the Intestinal Permeability by Actin Cytoskeleton Disruption	<b>Raphaël CORNU</b> • <i>Univ. Franche Comté - PEPITE, France</i>
11:30	Effect of Nanoparticles on the Bulk Shear Viscosity of A Biomimetic Lung Surfactant	<b>Jean-François BERRET</b> • <i>CNRS - MSC, France</i>
11:45	Nanoparticles dissolution induced by bio-relevant molecules	<b>Isabelle MICHAUD-SORET</b> • <i>CNRS - LCBM, France</i>
12:00	The fate of therapeutic nanoparticles in a model biological medium: interactions with serum albumin	<b>Frédéric GOBEAUX</b> • <i>CNRS - NIMBE, France</i>
12:15	Detection, identification and structural study of biomolecules by quantitative analysis of SERS spectra	<b>Marc LAMY DE LA CHAPELLE</b> • <i>Univ. Le Mans - IMMM, France</i>
12:30	Some keys for exploring nanocosmos in biofluids: other exoplanets?	<b>Wilfrid BOIREAU</b> • <i>CNRS - FEMTO-ST, France</i>

#### **NANO-OPTICS & NANOPHOTONICS 2**

10:45	Linear and ultrafast plasmonics with a single nano-object	<b>Natalia DEL FATTI</b> • <i>Univ. Claude Bernard - ILM, France</i>
11:15	Generalized Two-Temperature Fitting Algorithm for Ultrashort Laser Heating of Metal Film and Nanoparticles to spatially and...	<b>Jean-François BRYCHE</b> • <i>Univ. Sherbrooke - LN2, France</i>
11:30	Inelastic light scattering by vibrations of long narrow gold nanocrystals	<b>Lucien SAVIOT</b> • <i>CNRS - ICB, France</i>
11:45	Optical properties of advanced gold-based nanowires and exploitation as plasmon mediated remote Raman sensor	<b>Jean-Luc DUVAİL</b> • <i>Univ. Nantes - IMN, France</i>
12:00	Reaching a strong coupling regime between fluorescent emitters and plasmonic resonator using DNA	<b>Jeanne HEINTZ</b> • <i>Institut Langevin, France</i>
12:15	Fano profile and plasmonics Purcell factor	<b>Hugo VARGUET</b> • <i>Univ. Bourgogne - ICB, France</i>
12:30	Structure Property Relationship in Plasmonic Semiconductor Nanocrystals	<b>Jongwook KIM</b> • <i>EP - LPMC, France</i>
12:45	Visible/NIR photothermia with gold bipyramids and nanostars	<b>Florian AUBRIT</b> • <i>CNRS &amp; Cordouan - LCPO, France</i>
13:00	Photo-ablation of human vitreous opacities by light-induced vapor nano-bubbles	<b>Félix SAUVAGE</b> • <i>Ghent Univ. - General Biochemistry &amp; Physical Pharm. Lab, Belgium</i>

**13:15** Lunch, Poster session & Exhibition

Romanée-Conti  
Amphitheater

Santenay-Chablis  
room

Givry-Savigny  
room

14:30

## THEMATIC SESSIONS

## NANO-OPTICS &amp; NANOPHOTONICS 2

14:30	III-V semiconductors on Silicon nanophotonics	Fabrice RAINERI • Univ. Paris - C2N, France
15:00	Polarization- and diffraction-controlled second harmonic generation from semiconductor metasurfaces	Giuseppe MARINO • Univ. Paris - MPQ, France
15:15	Noise-enhanced detection and chaos with a driven electromechanical resonator	Franck CORREIA • Univ. Paris - C2N, France
15:30	Brillouin/Raman spectroscopy in optophononic resonators working in the 20-300 GHz frequency range	Anne RODRIGUEZ • Univ. Paris Sud/Paris Saclay - C2N, France
15:45	3D confinement of light inside rolled-up 2D photonic crystal membranes	Rémi BRICHE • EC Lyon - INL, France
16:00	Excitation of symmetry-protected modes in photonic crystals for electric field detection applications	Ayman HOBLOS • Univ. Franche-Comté - FEMTO-ST, France
16:15	Symmetry breaking in coherently driven-dissipative coupled nanocavities	Bruno GARBIN • CNRS - C2N, France

## 16:30 Coffee break, Poster session &amp; Exhibition

## BIO-INSPIRED NANOSYSTEMS

14:30	From bioactive polymeric vesicles to autonomous cell-like reactors	Sébastien LECOMMANDOUX • INP Bordeaux - LCPO, France
15:00	Triggering high-yield scalable production of extracellular vesicles from adipose stromal cells and local administration in a hydrogel...	Amanda SILVA BRUN • CNRS - MSC, France
15:15	Investigating the cytotoxicity, uptake and intracellular fate of dextrin-colistin conjugates as novel nanoantibiotics	Mathieu VARACHE • Cardiff Univ., United Kingdom
15:30	Artificial repeat proteins evolved as habit modifiers and protein origami templates for the morphosynthesis...	Erik DUJARDIN • CNRS - CEMES, France
15:45	Treatment of pediatric osteosarcoma using nanomedicine	Maria-José BLANCO-PIETRO • Univ. Navarra, Spain

## NANOPLASTICS &amp; NANOCOMPOSITES

14:30	Nanocomposites routes for improved polymer function properties: synthesis and key-factors	Eliane ESPUCHE • UCB - IMP, France
15:00	Characterization and presence of nanoplastic in our environments	Julien GIGAULT • CNRS - Geosciences, France
15:15	Raman Tweezers for small microplastics and nanoplastics identification in seawater	Marc LAMY DE LA CHAPELLE • Univ. Le Mans - IMMM, France
15:30	Core-shell diblock copolymer nanoparticles prepared by visible light photopolymerization-induced self-assembly: Application...	Vitalii TKACHENKO • Univ. Haute Alsace - IS2M, France
15:45	Overview of French research on microstructure-mechanical properties relationships in polymer nanocomposites	Florent DALMAS • INSA Lyon - MATEIS, France

# List of Oral Presentations

## Wednesday, December 11<sup>th</sup>

14:30

### THEMATIC SESSIONS

#### SURFACE, INTERFACE & NANOCONFINEMENT 1

14:30	Probing single molecules with AFM: Force, motion, dynamics, and function	Anne-Sophie DUWEZ • Liège Univ. - NanoChemistry & Molecular Systems Lab, Belgium
15:00	Development of a QCM/SERS biosensor for the observation of molecular interactions	Marc LAMY DE LA CHAPELLE • Univ. Paris Nord - CSPBAT, France
15:15	UA- AFM-IR platform for chemical and subsurface element density analysis	Eric LESNIEWSKA • Univ. Bourgogne - ICB, France
15:30	Probing the mineral / fluid interface using cryogenic XPS – a look into the electric double layer	Nicolas BOVET • Technical Univ. of Denmark - DTU, Denmark
15:45	Guest Trapping and Selectivity within mixed Clathrate Hydrates: a Grand Canonical Monte Carlo Study coupled with...	José Marcos SALAZAR CRUZ • CNRS - ICB, France
16:00	Toluene/ butanol binary solvents confined in periodic organosilicates	Aicha JANI • Univ. Rennes 1 - IPR, France
16:15	Directional transport of biomolecules through nanopores: an experimental approach of a nanoscale Brownian ratchet	Bastien MOLCRETTE • ENS Lyon - Physics Lab. of ENS Lyon, France

16:30 Coffee break, Poster session & Exhibition

17:00 C'NANO-SFNANO PhD AWARDS 2019 CEREMONY

18:15

### THEMATIC SESSIONS

#### YOUNG RESEARCHERS SESSION

18:15	Polymer-based nanogels for image-guided Boron Neutron Capture Therapy	Ghadir KALOT • UGA - IAB, France
18:20	Thrombolytic therapy based on P-Selectin targeted polysaccharide nanoparticles	Alina ZENYCH • Univ. Paris Nord - LVTS, France
18:25	Noninvasive in vivo multimodal imaging of multiple bone metastases using a bimodal tumor targeting contrast agent for fluorescence...	Jonathan LAVAUD • UGA - IAB, France
18:30	Drug delivery systems based on N-(2-hydroxypropyl) methacrylamide for treatment and diagnosis of arthritis	Alena LIBANSKA • Institute of Macromolecular Chemistry CAS, Czech Republic
18:35	Pegylated magnetic nanovectors functionalized with anti-EGFR scFv as a perspective siRNA vehicle for triple negative breast...	Phuoc Vinh NGUYEN • Univ. Tours - Nanodrugs & Nanoprobes Lab., France
18:40	Towards a novel biocompatible probe allowing for real-time temperature measurements at cellular scale	Lise ABIVEN • CNRS - LCMCP, France
18:45	Modulation of thermal dose in tumors by using magnetic nanoparticles	Clément VECCO-GARDA • Univ. Bordeaux - ICMCB, France
18:50	Design and self-assembly of HA-b-ELP block copolymers for cancer drug delivery applications	Manon LEVEQUE • Univ. Bordeaux - LCPO, France
18:55	Adsorption of Phosphates onto Iron Oxide Raspberry-Shaped Nanostructures for Peritoneal Dialysis	Paula DUENAS-RAMIREZ • ECPM - IPCMS, France

20:30 GALA DINNER

Romanée-Conti Amphitheater

Morey-St-Denis room

# Thursday, December 12<sup>th</sup>

## 08:30 **PLENARY SESSION**

**Nathalie KATSONIS**, *Univ. of Twente, Netherlands* - **Molecular nanomotors steering the motion of chiral droplets**

## 09:30

### THEMATIC SESSIONS

#### NANO FOR IMAGING, DIAGNOSIS AND THERANOSTICS

09:30 Nanophotonics: enabling technology for biosensing and imaging **Hatice ALTUG** • *EPFL - BioNanoPhotonic Systems Lab., Switzerland*

10:00 Investigation of gold quantum clusters for non-invasive in vivo optical imaging in the wide infrared window 700-1700 nm **Xavier LE GUEVEL** • *CNRS - IAB, France*

10:15 Probing intraneuronal transport in vivo with optically active photostable nanocrystals **François TREUSSART** • *ENS Paris Saclay - LAC, France*

## 10:30 **Coffee break, Poster session & Exhibition**

11:00 Supramolecular dendrimer nanosystem for bioimaging **Lyu ZHENBIN** • *AMU - CINAM, France*

11:15 Organic nanoparticles containing nickel-bis(dithiolene) complexes for photothermal theranostics **Franck CAMEREL** • *CNRS - ISCR, France*

11:30 Studying the preclinical ex-vivo distribution of metal nanoparticles: label-free direct elemental quantitative imaging with LA-ICP-MS **Benoit BUSSER** • *UGA - IAB, France*

11:45 Light-triggered delivery of functional macromolecules in cells and antibacterial agents in biofilms **Kevin BRAECKMANS** • *Ghent Univ. - General Biochemistry & Physical Pharm. Lab., Belgium*

#### NANOMATERIALS 2

09:30 Polymer-functionalized mesoporous materials : design and properties **Corine GERARDIN** • *CNRS - ICGM, Rennes*

10:00 Molecular adaptation in supramolecular self-assembly: brickwall-type phases of indacene-tetrone on silver surfaces **Corentin PIGOT** • *AMU - ICR, France*

10:15 Core-shell flower Nanoparticles: From chemical design to one step synthesis of hybrid gold nanoparticles and their interaction... **Jolanda SPADAVECCHIA** • *CNRS - CSPBAT, France*

## 10:30 **Coffee break, Poster session & Exhibition**

11:00 Programmed Assembly of Colloidal Polymers from Patchy Nanoparticles **Bin LIU** • *Univ. Bordeaux - ICMCB & CRPP, France*

11:15 Synthesis of N-Heterocyclic Carbene-stabilized gold nanoparticles **Alexandre PORCHERON** • *Sorbonne Univ. - LCMCP, France*

11:30 Unusual ligands for Cu and Ag nanoparticles stabilization **Pierre FAU** • *Univ. Toulouse P. Sabatier - LCC, France*

11:45 DNA-Functionalized Core/Shell AgInS<sub>2</sub>/ZnS Quantum dots **Annette DELICES** • *CEA - PHELIQS, France*

12:00 Injectable and degradable hydrogel for stroke recovery **Thomas TRIMAILLE** • *AMU - ICR, France*

## 12:30 **Lunch, Poster session & Exhibition**

# List of Oral Presentations

## Thursday, December 12<sup>th</sup>

14:00

### THEMATIC SESSIONS

#### NANOSCIENCE FOR CANCER

14:00	In quest of a suitable tool to assess drug and nanomedicine penetration into multicellular tumor spheroids	Simona MURA • Univ. Paris Sud - IGPS, France
14:15	Mechanical destruction of tumor microenvironment through rotating magnetic field-induced torque of nanoparticles	Véronique GIGOUX • INSERM - LPCNO, France
14:30	Design of multifunctional gold nanoparticles-loaded PLGA nanocarriers for biomedical applications	Laurent GAUTIER • UBFC - UTINAM, France
14:45	Targeting tumor-associated fibroblast and modulation of tumor stroma in cholangiocarcinoma with gold decorated iron oxide...	Alba NICOLAS • Univ. Paris - MSC, France
15:00	From the Ouzo effect to nanocapsules for radiotherapy enhancement – Application to glioblastoma	Clément GOUBAULT • CNRS - ISCR, France
15:15	Preclinical studies of the anti-glioblastoma NFL-TBS.40-63 peptide following intra venous administrations in adult rats	Joel EYER • INSERM - MINT, France
15:30	Poloxamer-based thermogel combined with 5Fu and oxaliplatin for prevention of recurrence after cytoreductive surgery	Johanne SEGUIN • CNRS - UTCBS, France
15:45	Long-term treatment of glioblastoma through a multi-drug nanomedicine hydrogel	Elia BOZZATO • Univ. Louvain - LDRI, Belgium
16:00	Verteoporfin-loaded lipid nanoparticles improve ovarian cancer photodynamic therapy in vitro and in vivo	Amandine HURBIN • INSERM - IAB, France
16:15	Phthalos into Nanos: Improving NIR Photodynamic Efficiency	Fabienne DUMOULIN • Gebze Technical Univ., Turkey

#### NANOSAFER BY DESIGN

14:00	SafeTiPaint project: towards the eco-design of a photocatalytic paint	Sébastien ARTOUS • CEA - PNS, France
14:30	Toxicological impact of safer-by-design In-based quantum dots	Fanny DUSSERT • ADEME – SyMMES, France
14:45	Immunotoxicity of poly(lactic-co-glycolic acid) nanoparticles: influence of surface properties on dendritic cell activation	Hervé HILLAIREAU • Univ. Paris Sud - IGPS, France
15:00	Organometallic hybrid nanoparticles for safer materials: preparation and physico-chemical characterization	Dafne MUSINO • INRA - BIA, France
15:15	Safer-by-Design Biocide Made of Tri-thiol Bridged Silver Nanoparticle Assemblies	Aurélien DENIAUD • UGA - LCBM, France
15:30	Safe design of recycling Ag-nanowire on printed paper electronic	Bahareh ZAREEIPOLGARDANI • UGA - ISTERre, France
15:45	Global Health Impacts of Nanotechnology: Laws Governing Nanosafety and Nanomaterials	Ilise FEITSHANS • UGA – ISTERre, France

Romanée-Conti  
Amphitheater

Morey-St-Denis  
room

Givry-Savigny  
room



14:00

## THEMATIC SESSIONS

### SURFACE, INTERFACE & NANOCONFINEMENT 2

14:00	Fluids in nanoporous confinement: how are they different?	Denis MORINEAU • CNRS - IPR, France
14:30	High-pressure intrusion of electrolyte aqueous solutions in hydrophobic micro- and mesoporous solids for mechanical...	Andrey RYZHIKOV • CNRS – IS2M, France
14:45	Nanothermodynamics from theory to applications	Jean-Marc SIMON • Univ. Bourgogne – ICB, France
15:00	Giant thermoelectric response of nanofluidic systems driven by water excess enthalpy	Laurent JOLY • UCB – ILM, France
15:15	Dynamic and heterogenous ordering of perylene on Ag(110)	Laurent GUILLEMOT • CNRS, ISMO, France
15:30	Atomic-scale spin sensing with a single-molecule at the apex of a scanning tunneling microscope	Benjamin VERLHAC • CNRS – IPCMS, France
15:45	Structural and electrical properties of nanostructured W-Ag thin films	Housseem BOUKHALFA • Univ. Bourgogne Franche-Comté – ICB, France
16:00	Protein corona study by scattering correlation spectroscopy: A comparative study between spherical and urchin-shaped...	Nadia DJAKER • Univ. Paris Nord - CSPBAT, France

16:30

### BEST TALKS & POSTERS AWARDS CEREMONY

17:00

### CLOSING SESSION



The background features a network of thin, light blue lines radiating from the left side, connecting to various colored circles in shades of pink, blue, yellow, green, and grey. The overall color palette is soft and pastel, with a light blue gradient background.

# **ABSTRACTS OF INVITED SPEAKERS**

# Plenary Speakers



## Ashutosh CHILKOTI

Professor at Duke University  
Department of Biomedical Engineering  
Durham, United States  
[chilkotilab.pratt.duke.edu](http://chilkotilab.pratt.duke.edu)  
[chilkoti@duke.edu](mailto:chilkoti@duke.edu)

### Biography

Ashutosh Chilkoti is the Alan L. Kaganov Professor and the Chair of the Department of Biomedical Engineering at Duke University. His areas of research include genetically encoded materials and biointerface science. He has worked extensively on developing elastin-like polypeptides for protein purification and drug delivery, and on the development of “non-fouling” polymer brushes and their application in clinical diagnostics. Prof. Chilkoti has won numerous awards, including the *Clemson Award for Contributions to the Literature* by the Society for Biomaterials, the *Robert A. Pritzker Distinguished Lecture award* by the Biomedical Engineering Society, and he is a member of the *National Academy of Inventors*. He is also the founder of five start-up companies.

### MOLECULAR ENGINEERING OF NANOSCALE POLYMER INTERFACES AND NANOPARTICLES FOR DIAGNOSTICS AND DRUG DELIVERY

This talk will highlight recent work from my laboratory that illustrates the design of nanoscale polymer interfaces and nanoparticles, with applications in point-of-care clinical diagnostics and drug delivery. In the first example, I will describe a point-of-care diagnostic—the D4 assay—that we have developed, in which all reagents are printed and stored on a “non-fouling”—protein and cell resistant—polymer brush that is 10-100 nm thick. The D4 assay, involves four sequential events: (1) **D**ispense (droplet of blood); (2) **D**issolve (printed reagents on chip); (3) **D**iffuse (across surface); and (4) **D**etect (binding event). Examples of quantitative dose-response from whole blood will be presented. The D4 assay can be used for the diagnosis of all markers for which antibody pairs are available with a speed and sensitivity that is as good or better than commercially available point-of-care tests and is far simpler, cheaper, more rugged, and does not require a cold-chain. In the area of drug delivery, I will discuss attachment-triggered self-assembly of recombinant peptide polymers that package cancer chemotherapeutics into soluble polymer nanoparticles that can improve their efficacy. Examples of encapsulating doxorubicin and paclitaxel will be presented to illustrate the versatility of this new technology for drug delivery. Mechanistic studies on the efficacy of the doxorubicin loaded nanoparticles show that they unleash a strong anti-tumor immune response, which is not seen with the free drug, suggesting that their potency is not just related to their direct tumor cytotoxicity, but that it has a strong immunological component. I will also discuss ongoing efforts to design the next generation of drug-loaded “stealth” nanoparticles that have improved pharmacokinetics and pharmacodynamics. Finally, I will show how the receptor-mediated uptake of multivalent ligand-decorated nanoparticles by tumor cells can be modulated by control of the shape and flexibility of the nanoparticle.

**Keywords:** genetically encoded peptide polymers, polymer brush, nanoparticles, point-of-care, clinical diagnostics, protein microarray, cancer, drug delivery



## Nathalie KATSONIS

Professor at University of Twente

Biomolecular NanoTechnology Laboratory  
Enschede, The Netherlands

[www.katsonis.eu](http://www.katsonis.eu)

[n.h.katsonis@utwente.nl](mailto:n.h.katsonis@utwente.nl)

### Biography

Nathalie Katsonis received her PhD from the University Pierre et Marie Curie (Paris, France) for her work on chirality and order in molecular self-assemblies (2004). She then joined the group of Ben Feringa (Groningen, The Netherlands), where she was extended her research interests to artificial molecular motors and photo-switches. Nathalie is currently Professor of Chemistry at the University of Twente, where she leads a research group dedicated to the design and synthesis of life-inspired molecular systems and materials. She is the recipient of competitive research grants from the Dutch Research Council, and prestigious grants from the European Research Council. She has been elected to the Young Academy of the Royal Netherlands Academy of Arts and Sciences, and in 2017 she received the Gold Medal of the Royal Netherlands Chemical Society in recognition for her academic achievements.

### MOLECULAR NANOMOTORS STEERING THE MOTION OF CHIRAL DROPLETS

Living matter moves, and modern chemistry has thus researched the mechanisms by which the sophisticated motion of organic molecules can be expressed into active and complex motile behaviour [1]. In spite of inspiring progress, how chemistry might have transitioned into the purposeful and uniquely directional motion of near-macroscopic entities remains unknown [2].

Notably, the vast majority of aquatic microorganisms and cells swim along helical trajectories, including zooplankton, ciliates and bacteria. Whilst the evolutionary advantages of helical motion remain unclear, it is certain that the direction of helical trajectories being less sensitive to random perturbations than rectilinear motion. We have investigated the movement of chiral droplets along helical trajectories, and have discovered that molecular nanomotors can steer the propagation of these drops in a deterministic way. This behavior emerges from the transmission of dynamic molecular chirality across increasing length scales, from the nanoscale (chiral molecules) to mesoscale (the liquid crystal) and eventually up to the near-macroscopic functional level (the droplets) [3].

### References

- [1] F. Lancia, A. Ryabchun, N. Katsonis, *Nat. Rev. Chem.* 2019, 10.1038/s41570-019-0122-2.
- [2] A. Aspuru-Guzik, ..., N. Katsonis et al., *Nat. Chem.* 2019, 11, 286 – 294 (2019).
- [3] F. Lancia, T. Yamamoto, A. Ryabchun, T. Yamaguchi, M. Sano, N. Katsonis, *Nature Communications* 2019.

**Keywords:** chirality, artificial molecular motors, light-responsive soft matter, molecular nanoscience

# Plenary Speakers



## Romain QUIDANT

Professor at ICREA

ICFO Institute

Barcelona, Spain

[www.icfo.eu/lang/research/groups/groups-details?group\\_id=27](http://www.icfo.eu/lang/research/groups/groups-details?group_id=27)

[romain.quidant@icfo.eu](mailto:romain.quidant@icfo.eu)

### Biography

Romain Quidant received a PhD in Physics in 2002 from the University of Dijon (France). Right after, he joined ICFO as a postdoctoral researcher. This was the year of its creation and he was lucky enough to get actively involved into the early developments of the Institute. In 2006, he was appointed junior Professor (tenure-track) and group leader of the *Plasmon NanoOptics* group at ICFO. In 2009, he became tenure Professor both at ICFO and ICREA. While his core expertise is in fundamental nano-optics, he is very much interested in multidisciplinary research, interfacing physics with other disciplines of science, as well as in technology transfer. He is recipient of 4 ERC grants (StG2010, PoC2011, PoC2015 and CoG2015) and several international and national prizes (Fresnel2009, City of BCN2010, ICO2012, CAT2014, BS2017). Since 2014, I serve as an associate editor at ACSPhotonics (American Chemical Society).

### PUTTING NANO-OPTICS TO WORK!

Twenty years of extensive research in the field of nanooptics have enabled us to considerably advance light control on the nanometer scale. Beyond the original *peak of inflated expectation*, the assets of nanooptics over other technologies, along with its limitations, became clearer. More recently, the field has entered into the *slope of enlightenment* in which its actual contribution to both basic research and novel technologies has been better identified. In this talk, following a general introduction on the main assets of nano-optics, we will review different aspects of our research where nano-optical resonators are used as an enabling technology that can benefit a wide range of scientific disciplines, all the way from reconfigurable planar optics to biomedicine.

The first part of the talk focuses on our recent efforts towards reconfigurable metasurfaces. Our approach relies on dynamically controlling the refractive index in the close vicinity of a silicon metalens by means of a resistor embedded in a thermo-optical polymer. We demonstrate precise and continuous tuneability of the focal length, and achieve focal length variations larger than the Rayleigh length for voltage as low as 10V and time-response in the 10ms range. We also demonstrate that by solving the inverse problem, we are able to deterministically achieve any desired phase front. In the second part of the talk, we discuss the use of both dielectric and metallic nanoresonators in the context of biosensing and lab-on-a-chip technology. The sensors are integrated into a state-of-the-art PDMS microfluidic environment and their surface functionalized to achieve specific detection of the targeted biomarkers. We directly compare the performance of gold and silicon nanosensors and discuss their respective advantages. Finally, we discuss our latest advances in the field of thermoplasmonics, presenting two new application in additive manufacturing (3D printing) and disinfection of surgical implants.

**Keywords:** nanooptics, plasmonics, biosensing, metasurfaces, biotechnology



# Keynote Speakers



## Hatice ALTUG

Professor at EPFL

Bionanophotonic Systems Laboratory

Lausanne, Switzerland

<https://bios.epfl.ch/>

[hatice.altug@epfl.ch](mailto:hatice.altug@epfl.ch)

### Biography

Hatice Altug is professor of Bioengineering Department at Ecole Polytechnique Federale de Lausanne (EPFL), Switzerland. She is also director of EPFL Doctoral School in Photonics. She received her Ph.D. in Applied Physics from Stanford University. Her research is focused in the field of nanophotonics and its application to biosensing. She is the recipient of 2012 Optical Society of America Adolph Lomb Medal and U.S. Presidential Early Career Award for Scientists and Engineers in 2011, which is the highest honor bestowed by the United States government on outstanding scientists and engineers in their early career. She received European Research Council Consolidator Grant, U.S. Office of Naval Research Young Investigator Award, U.S. National Science Foundation CAREER Award and IEEE Photonics Society Young Investigator Award among others. She is the winner of the Inventors' Challenge competition of Silicon Valley and has been named to Popular Science Magazine's "Brilliant 10" list.

### NANOPHOTONICS: ENABLING TECHNOLOGY FOR BIOSENSING AND IMAGING

Nanophotonics excels at confining light into nanoscale optical mode volumes and generating dramatically enhanced light-matter interactions. Engineered optical nanostructures can manipulate light in ways that are not possible to achieve with diffraction-limited optics and natural materials. The unique aspects of nanophotonics are leading to numerous disruptive technologies including in biosensing and imaging. Our laboratory is working on the application of nanophotonics to introduce powerful biosensors that can have impact on a wide range of areas including basic research in life sciences, early disease diagnostics, safety and point-of-care devices. In particular, we exploit nanophotonics toolkits to address key challenges of current biosensors by developing devices that can enable label-free, ultra-sensitive, multiplexed, rapid and real-time measurements on biological systems including disease biomarkers, pathogens and living cells. We employ a variety of nanophotonic techniques including dielectric metasurfaces and plasmonics. We introduce new nanofabrication procedures that can enable high-throughput manufacturing of sensing chips at low costs. We integrate our sensors with micro/nanofluidic systems for efficient sample manipulation. We also combine the use of smart data science tools with bioimaging architectures for achieving unprecedented sensor performance. In this talk I will present some of our recent results on nanophotonic metasurfaces for sensing and imaging as well as their applications in real-world settings.

**Keywords:** nanophotonics, plasmonics, metasurfaces, microfluidics, bioimaging, biosensing



# Keynote Speakers



## Sébastien ARTOUS

CEA Research Engineer

NanoSafety Plateform (PNF)

Grenoble, France

[www.cea.fr/cea-tech/pns/](http://www.cea.fr/cea-tech/pns/)

[adresse.mail@de.contact](mailto:adresse.mail@de.contact)

### Biography

Sébastien Artous was research engineer in ventilation and filtration of aerosols at the “Institut de radioprotection et de sûreté nucléaire” (IRSN) from 2005 to 2011. He joined the NanoSafety Platform of CEA Grenoble in 2011. He is in charge of field measurements for the Assessment of Exposure to airborne particles at workplace. He worked on the development of an experimental protocol for collective protective equipment (CPE). He started to work on nanometrology of nanoparticles in the frame of French new regulation (nano decree) in 2012. He contributed to the French projects Nanomet, Depol2 and Saxsize. He has been involved also in European projects, Nanoleap, FutureNanoNeeds, Integral, Biorima and nPSize. He joined the Labex SERENADE (Towards safer and eco-designed innovative nano materials) in 2018. He is the project manager of SafeTiPaint 1&2 projects for the development of a Safer-by-Design TiO<sub>2</sub>-based Paint.

### SAFETIPAINTE PROJECT: TOWARDS THE ECO-DESIGN OF A PHOTOCATALYTIC PAINT

Eco-design for the development of new applicative products is a challenging way where multidisciplinary approach is the key to the success. The SafeTipaint project is to design, through an eco-design approach, a paint containing photocatalytic TiO<sub>2</sub> nanoparticles taking into consideration safety aspects at every step of the value chain. This project gathers partners from different fields such as synthesis, paint formulation, use until the end of life, characterization and tox/ecotox testing. New types of photocatalytic TiO<sub>2</sub> nanoparticles were synthesized and their photocatalytic activities were tested. Two synthesis schemes were explored. The first one consists of grafting TiO<sub>2</sub> nanoparticles onto cellulose nanocrystals, and the second consists of coating the TiO<sub>2</sub> nanoparticles with bio-inspired ligands. Among these synthesized nanoparticles, the best candidates were selected and incorporated into an organic paint matrix. Coated liquid paints were aged and analyzed. For this purpose, paints were placed in an ageing climatic chamber with controlled parameters (light, temperature, relative humidity, time). Photocatalytic efficiency was then measured for pristine and aged paints. Moreover, mechanical solicitation (abrasion testing) was performed with aerosols emission measurements. Toxicology studies were conducted in order to take into account hazardousness of these nanoparticles (pristine particles, formulated paints and emitted debris) under the frame of SERENADE. In agreement with the main objective of this project, it appeared that these two batches of nanoparticles integrated in the paints prevented the UV degradation of the matrix in comparison to reference TiO<sub>2</sub> nanoparticles. Toxicology studies highlighted that these modified TiO<sub>2</sub> nanoparticles do not present cytotoxic effect. SafeTipaint 2 project is now focusing on the optimization of the two synthesis schemes, CNC-TiO<sub>2</sub> hybrids and grafting TiO<sub>2</sub> to realise a new implementation in an inorganic paint matrix. The aim is to reduce the impact of TiO<sub>2</sub> on the matrix degradation.

This work is a contribution to the LABEX SERENADE (n°ANR-11-LABX-0064) funded by the “Investissements d’Avenir” French Government program of the French National Research Agency (ANR) through the A\*MIDEX project (N° ANR-11-IDEX-0001-02).

**Keywords:** safer by design, TiO<sub>2</sub>, nanoparticles, artificial weathering, photocatalytic paints, aging



# Keynote Speakers



## Stéphane BERCIAUD

Professor at Strasbourg University

IPCMS Laboratory (CNRS, Univ. Strasbourg)

Strasbourg, France

[www.ipcms.unistra.fr/?page\\_id=9383&lang=en](http://www.ipcms.unistra.fr/?page_id=9383&lang=en)

[stephane.berciaud@ipcms.unistra.fr](mailto:stephane.berciaud@ipcms.unistra.fr)

### Biography

Stéphane Berciaud is Professor at the University of Strasbourg (Unistra) since 2016 and junior member of the Institut Universitaire de France (IUF). His expertise is in the optical spectroscopy of low-dimensional systems. After a PhD on ultrasensitive optical detection and spectroscopy of individual nano-objects at Université de Bordeaux, he contributed - as postdoctoral scientist at Columbia University (US) then as assistant professor at Unistra- to pioneering works on exciton dynamics, inelastic light-scattering and energy transfer in carbon nanotubes and graphene. Since 2013, SB leads a research team at IPCMS that focuses on 2D materials and related “van der Waals heterostructures”. His current interests include optical spectroscopy and opto-electronics in 2D semiconductors and 2D semiconductor/graphene heterostructures as well as opto-electro-mechanics in nano-resonators made from suspended 2D materials. SB is a recipient of a fellowship from the Unistra Institute for Advanced Study (USIAS) and of the Bronze Medal of CNRS.

### ATOMICALLY THIN HETEROSTRUCTURES MADE FROM GRAPHENE AND TRANSITION METAL DICHALCOGENIDES: AN EMERGING CLASS OF PHOTONIC AND OPTO-ELECTRONIC BUILDING BLOCKS

Two-dimensional materials, such as monolayers of transition metal dichalcogenides (TMD), graphene or boron nitride compose a genuine toolkit of atomically-thin crystals with remarkable electronic, optical, spin and valley properties. These assets can be enhanced by stacking 2D layers into so-called van der Waals heterostructures and thereby tailoring novel opto-electronic functionalities and devices. The performance of such devices is governed by near-field coupling through, e.g., interlayer charge and/or energy transfer. As a result, new concepts and experimental methodologies are needed to properly describe atomically sharp heterointerfaces in van der Waals heterostructures. This presentation will focus on model 2D semiconductor-metal heterojunctions made from TMD monolayers coupled to graphene monolayers.

First, I will describe the most salient fingerprints of near-field coupling, namely fast (picosecond) energy transfer and much slower photoinduced charge transfer to graphene, revealed by photoluminescence (PL) and Raman scattering spectroscopy, respectively [1]. Second, I will demonstrate that graphene not only neutralizes TMD monolayers but also enables selective energy transfer, leading to bright, single and narrow-line PL arising solely from TMD neutral excitons [2]. Finally, I will discuss the implications of our results for opto-valleytronics and chiral optics [3], in light of our recent studies of large valley polarization and coherence in TMD-graphene heterostructures [4].

*This work was done with E. Lorchat, L.E. Parra-Lopez and G. Froehlicher, S. Azzini, T. Chervy, T.W. Ebbesen and C. Genet at U. Strasbourg; C. Robert, D. Lagarde, and X. Marie at INSA Toulouse.*

**Keywords:** Transition Metal Dichalcogenides, Graphene, van der Waals heterostructures, excitons, charge and energy transfer, spin-valley locking, photoluminescence, Raman scattering

### References

- [1] G. Froehlicher, E. Lorchat, S. Berciaud, Phys. Rev. X 8 011007 (2018)
- [2] E. Lorchat, L. E. Parra López et al., submitted (2019)
- [3] T. Chervy, S. Azzini, et al., ACS Photonics 5, 1281 (2018)
- [4] E. Lorchat, S. Azzini, T. Chervy et al., ACS Photonics 5, 5047 (2018)

# Keynote Speakers



## Maria José BLANCO-PRIETO

Professor at Navarra University

Department of Pharmaceutical Technology and Chemistry  
Pamplona, Spain

[www.unav.es](http://www.unav.es)

[mjblanco@unav.es](mailto:mjblanco@unav.es)

### Biography

Maria José Blanco-Prieto received her Pharmacy Degree from the University of Santiago de Compostela (Spain), followed by a PhD in Pharmaceutical Sciences from the University of Paris-Sud (France). She completed a post-doctoral training at the Swiss Federal Institute of Technology (ETH), Zürich, (Switzerland) and then joined the University of Navarra where she is presently Full Professor. Her research lay in the field of nanomedicine and advanced drug carrier systems for developing effective therapies in regenerative medicine and cancer. She is the author of more than 140 research papers and book chapters with more than 5.800 cites (H-index 45), 4 editorials, 5 patents and over 170 communications at scientific conferences, many of them as invited speaker. She is member of the National Academy of Pharmacy of France and of the Royal Academy of Pharmacy of Galicia (Spain). She is also a board member of the Executive Committee of the European Federation of Pharmaceutical Scientists (EUFEPS).

### THE TREATMENT OF PEDIATRIC OSTEOSARCOMA USING NANOMEDICINE

Osteosarcoma (OS) is the most frequent primary malignant bone tumor in the pediatric population and one of the most frequent causes of pediatric cancer death. Primary OS develops in large bones with high growth potential such as the femur, tibia or humerus; however, OS must be considered a systemic disease because although only 20% of the patients present visible metastasis at diagnosis, micrometastatic or circulating disease is assumed in nearly all patients [1]. Despite the combination of several cytotoxic drugs including methotrexate, doxorubicin, cisplatin or ifosfamide, the 5-year survival for patients with detectable metastasis is still 10-30%. Therefore, new therapies are urgently needed to improve the disease prognosis [2].

Nanomedicines have emerged as novel candidates, especially for high-risk or relapsed patients when common drugs are unable to achieve success [3]. The focus of this talk will be to discuss the efficacy of orally administered edelfosine-loaded lipid nanoparticles [4] for the treatment of pediatric osteosarcoma [5], the most frequent primary malignant bone tumor in the pediatric population.

**Keywords:** nanomedicine, lipid nanoparticles, pediatric cancer, osteosarcoma

### Acknowledgements

Asociación Española Contra el Cáncer (AECC) (CI14142069BLAN) and Fundación Caja Navarra are gratefully acknowledged. We are indebted to all our patients and families.

### References

- [1] González-Fernández Y et al., *Cancer Lett*, 2017, 388, 262- 268
- [2] González-Fernández Y et al., *Curr Pharm Des.* 2015, 21, 6104-24
- [3] Rodríguez-nogales C et al., *ACS Nano*, 2018, 12, 7482-7496
- [4] Lasa-Saracibar B et al., *Cancer Lett* 2013, 334, 302- 310
- [5] González-Fernández, Y et al., *Cancer Lett* 2018, 430, 193- 200

# Keynote Speakers



## Wilfrid BOIREAU

CNRS Recherche Director

FEMTO-ST Institute (CNRS, UTBM, UBFC, ENSMM)

Besançon, France

[teams.femto-st.fr/BioMicroDevices/](https://teams.femto-st.fr/BioMicroDevices/)

[wboireau@femto-st.fr](mailto:wboireau@femto-st.fr)

### Biography

Wilfrid Boireau, CNRS senior researcher, obtained his Ph.D degree in enzymatic engineering from UTC, Compiègne in 1999. After a post-doc position in the Center of Molecular Genetics, Gif/Yvette in 2000-01, he joined the CNRS as a permanent researcher in a laboratory of physics, Besançon. In 2004, at the creation of the FEMTO-ST, he was responsible of a transversal program called “microtechniques for proteomic” involving physicists and biochemists. In 2008, he co-founds the “Clinical - Innovation Proteomic Platform” (CLIPP) member of the IBISA French network. Since 2015, he is director of MN2S department at FEMTO-ST. His current researches, in the BioMicroDevices Group, deals with the development of biochips integrated in sensors and analytical platforms for clinical proteomics and diagnosis.

Co-author of 63 publications (1697 citations; H Index 17) and of 4 patents, Dr W. Boireau has also presented around 150 communications in national and international conferences.

### SOME KEYS FOR EXPLORING NANOCOSMOS IN BIOFLUIDS: OTHER EXOPLANETS?

Almost all cells (prokaryotic and eukaryotic cells) shed vesicles in a regulated manner and under physical/chemical stimulations. Due to their extreme heterogeneity in size, concentration, biogenesis and composition, the term “extracellular vesicles” (EVs) was recommended for the definition of vesicles isolated from either the cell culture supernatants or the body fluids. Previously considered as cellular nano-dusts, it has been established during the last decade that EVs plays many functional roles in organisms. For example, nanosized vesicles released by tumor micro-environment exhibit multiple functions including supporting of tumor growth and preparation of the pre-metastatic niches. On the other way, their massive presence in body-fluids, constituting a dynamic nanocosmos, represents a promising pool of biomarkers of human pathologies. Moreover, as they act as shuttles of many molecular species in all the body fluids, EVs enforce the potential of liquid biopsy. Last but not least, EV research has recently explored their potential as a drug delivery vehicle for improving the outcomes of cancer patients.

Due to their inherent properties/characteristics and their release in very complex media, the current challenges deal with their global isolation, the methods of quantitation and characterization, as well as downstream analysis of EV contents.

Despite increasing knowledges in the EV field brought by many studies using conventional (pre-)analytical techniques, there is a strong need of new techniques and instrumentations in order to decipher the composition and the role of numerous EVs subpopulation co-existing in biofluids.

The keynote lecture will highlight the most current strategies and those envisioned, involving nano/micro-tools, for the exploration of this nanocosmos.

**Keywords:** extracellular vesicles, biomarker, body-fluids, pre-analytical and analytical solutions, nanocosmos

# Keynote Speakers



## Alexandre BOUHELIER

CNRS Research Director,  
ICB Laboratory (CNRS, UB, UTBM)  
Dijon, France  
[icb.u-bourgogne.fr/equipe/alexandre-bouhelier](http://icb.u-bourgogne.fr/equipe/alexandre-bouhelier)  
[alexandre.bouhelier@u-bourgogne.fr](mailto:alexandre.bouhelier@u-bourgogne.fr)

### Biography

Alexandre Bouhelier got a PhD in Physics (2001-Uni. Basel, CH). His research started with the development of scanning near-field optical microscopy. He spent four years in the US (Institute of Optics, University of Rochester & Argonne National Laboratory) as a postdoc before integrating the CNRS where he is now a research director conducting his research at the Laboratoire Interdisciplinaire Carnot de Bourgogne (ICB), Université de Bourgogne Franche-Comté. His current research is focused at developing atomic-scale functional electro-optical components and nonlinear plasmonic devices. He is currently the head of the technological platform ARCEN-Carnot hosted by the University.

### TRANSDUCING ELECTRONS AND PHOTONS IN ATOMIC-SCALE OPTICAL FEED

Initiated as a cable-replacement solution, short-range wireless power transfer has rapidly become ubiquitous in the development of modern high-data throughput networking in centimeter to meter accessibility range. Wireless technology is now penetrating a higher level of system integration for chip-to-chip and on-chip radiofrequency interconnects. However, standard CMOS integrated millimeter-wave antennas have typical size commensurable with the operating wavelength, and are thus an unrealistic solution for downsizing transmitters and receivers to the micrometer and nanometer scale. Here, we describe a new method for nanoscale information processing based on a reversible transduction between electron and a photon using optical gap antennas. Our concept provides a novel approach where the light source and the detector are integrated into a single metallic nanostructure. At the core of the device is an atomic-scale tunnel gap whereby optical rectification, inelastic tunneling, and hot carriers can reciprocally mix photons and electrons with ultrafast conversion dynamics. We demonstrate a wireless near infrared link between an optical antenna and a sub-nanometer rectifying antenna converting the transmitted optical energy into direct current (d.c.). We further discuss the peculiarity of the broadband spectrum emitted from the antenna feed upon the injection of electrons. The source can be readily integrated to plasmonic and photonic waveguides. The co-integration of atomic-scale optical functional devices with an electronic transduction offers a disruptive solution to interface photons and electrons at this ultimate length scale.

**Keywords:** tunnel junctions, hot electrons, nanoscale optical antennas and rectennas

# Keynote Speakers



## Kevin BRAECKMANS

Professor at Ghent University

General Biochemistry & Physical Pharmacy Laboratory  
Gent, Belgium

[www.biofys.ugent.be](http://www.biofys.ugent.be)

[Kevin.Braeckmans@UGent.be](mailto:Kevin.Braeckmans@UGent.be)

### Biography

Kevin Braeckmans joined the Laboratory of General Biochemistry and Physical Pharmacy (Ghent University) after having obtained a Licentiate degree in Physics in 1999 to perform research on advanced optical microscopy methods for pharmaceutical applications. In 2004 he received a post-doctoral fellowship from the Fund for Scientific Research – Flanders, focusing on single particle tracking microscopy. In 2008 he was appointed as professor at Ghent University as the group leader of the Bio-Photonics Research Group in close collaboration with the Ghent Research Group on Nanomedicines (prof. Stefaan De Smedt). Since 2015 he holds a position as Guest Professor at the University of Lille (France), and became a full professor at Ghent University in 2018. Ongoing research focuses on the study of biological barriers of functional nanomaterials by advanced microscopy techniques, as well as intracellular light-triggered drug delivery funded by an ERC Consolidator Grant (NANOBUBBLE, 2015-2020).

### LIGHT-TRIGGERED DELIVERY OF FUNCTIONAL MACROMOLECULES IN CELLS AND ANTIBACTERIAL AGENTS IN BIOFILMS

Efficient and safe delivery of functional molecules in cells remains a great challenge. This is not only true for in vivo applications, but as well for the manipulation of cells in vitro or ex vivo, especially when working with hard-to-transfect primary cells. Examples include the production of engineered cells for cell-based immunotherapies and the differentiation of stem cells for tissue engineering applications. Although substantial effort has gone into designing non-viral nanocarriers for intracellular delivery, limited uptake or entrapment in endosomes remains a substantial bottleneck. Physical delivery methods may provide a viable alternative in this case. Originating from the 1980s, electroporation is the best known and most widely used physical cell transfection method today. It is, however, often associated with high cell toxicity, while surviving cells reportedly may suffer from an altered phenotype or reduced cell functioning. Laser-induced photoporation in combination with photothermal nanoparticles, is an alternative physical delivery method that is receiving increasing attention. Especially in combination with pulsed laser light, excellent delivery efficiencies with high cell viability have been obtained for a broad range of molecules and cell types. With pulsed laser irradiation photothermal nanoparticles can be quickly heated so that water vapour nanobubbles can emerge in a hydrated environment. When the nanoparticles are in close contact with cells, these laser-induced vapour nanobubbles can create pores in the cell membrane through which external compounds can diffuse into the cell. Although the concept was demonstrated a little over a decade ago, over the past 7 years my research group has been working intensively to explore the usefulness of this approach for various applications and improve upon its efficiency. In this presentation I will give an overview of this work, which ranges from the production of engineered T-cells, over delivering contrast agents into cells for microscopy and in vivo imaging, to delivery of antimicrobial agents in biofilms and even the destruction of floaters in human eyes. Recent work in which we improve upon safety and efficiency thanks to new material concepts will be highlighted as well.

**Keywords:** intracellular drug delivery, cell engineering, light-triggered drug delivery, biofilms, biophotonics

# Keynote Speakers



## Lea Ann DAILEY

Professor at Vienna University

Department of Pharmaceutical and Biopharmacy  
Vienna, Austria

[leaann.dailey@univie.ac.at](mailto:leaann.dailey@univie.ac.at)

### Biography

Lea Ann Dailey is a pharmacist by training and completed her PhD at the Philipps University of Marburg, Germany, on the topic of biocompatibility testing of polymeric nanoparticles for the controlled release of drugs in the lung. She continued working in the field of formulation science for inhalation therapies at Nektar Therapeutics (now Novartis, San Carlos, CA, USA), followed by positions as Lecturer/Senior Lecturer in Drug Delivery at King's College London, UK and Professor in Biopharmacy at the Martin Luther University Halle-Wittenberg, Germany. In November 2019 she joined the Pharmacy Dept. of the University of Vienna as Professor of Pharmaceutical Technology and Biopharmacy, where she continues to expand her research in the design and safety testing of nanomedicines and nanodiagnostics.

### NANOMEDICINE TOXICOLOGY FOR SENSITIVE ADMINISTRATION ROUTES

A wide range of new functional materials have been developed for healthcare applications and many of these materials are formulated as nanoparticulate systems. Understanding the complex interactions between biomaterials, nanoparticles and the body is not only a requirement along the journey towards clinical translation, but also a fascinating research area. Positioned at the interface between material and colloid science, pharmaceutical science and toxicology, we investigate new nanomaterials in the very earliest research stages for biocompatibility in various physiological environments. We specialize in assessing novel nanomaterials, which might be administered to patients via highly sensitive delivery routes, such as inhalation or parenteral administration. This presentation will highlight some of our major findings and learnings, covering the following topics:

- How does the lung react to nanoparticle surface features? Can safety be designed into a system?
- Nanoparticle interactions with phagocytic cells: What should we be on the lookout for?
- Quality and safety: Why quality-by-design principles should be implemented in basic research

**Keywords:** nanomedicine toxicology, pulmonary, parenteral, foamy macrophages

# Keynote Speakers



## Natalia DEL FATTI

Professor at Claude Bernard University of Lyon

ILM Laboratory (CNRS, UCBL)

Villeurbanne, France

[ilm.univ-lyon1.fr/femtonanooptics](http://ilm.univ-lyon1.fr/femtonanooptics)

[natalia.del-fatti@univ-lyon1.fr](mailto:natalia.del-fatti@univ-lyon1.fr)

### Biography

Natalia Del Fatti studied Electronic engineering at Politecnico di Milano (Italy) and Physics at Ecole Polytechnique (France), where she also received her Ph.D in 1999. She has more than twenty year-experience in the field of ultrafast dynamics of semiconductors, bulk metals and metal nanoparticles. She was appointed Assistant Professor at the University of Bordeaux in 2000, where she developed a novel research axis on single nano-object optical spectroscopy. Professor at University Lyon 1 since 2006 and member of Institut Universitaire de France, she founded the FemtoNanoOptics group specialized in optical investigations of nanomaterials. Her current research interests include non-linear optics, ultrafast lasers, plasmonics and nanophysics (nano-optics, electronics, acoustics and thermics). She is head of the Master “Physics & Chemistry- Sciences de la Matière” joint with Ecole Normale Supérieure de Lyon, and will coordinate the multidisciplinary Labex iMUST (Institute for Multiscale Science & Technology) from 2020.

### LINEAR AND ULTRAFAST PLASMONICS WITH A SINGLE NANO-OBJECT

The large size and environment dependences of the optical response of metal nano-objects have led to considerable interest in the academic and industrial domains. In particular, they have been extensively exploited to design new optical materials or to create nanosensors, opening the fields of nanophotonics and plasmonics.

Because of the very weak optical response of a single nano-object, most investigations have been performed simultaneously probing a large number of particles, only providing mean information. This limitation can be overcome by investigating individual nanoparticles, which requires development of high sensitivity detection schemes. In this talk, after introducing a far-field optical method to investigate single-particle light scattering and absorption based on spatial modulation spectroscopy, we will discuss plasmonic experiments on single metal nanoparticles, focusing on the impact of the local environment on its optical response. Extension of this method to ultrafast nonlinear spectroscopy will also be introduced, permitting to investigate the electronic, acoustic and thermal responses at the nanoscale.

**Keywords:** single metal nanoparticles, spatial modulation spectroscopy, ultrafast spectroscopy, optical, acoustic and thermal response



# Keynote Speakers



## Anne-Sophie DUWEZ

Professor at Liège University

Molecular Systems Research Unit

Liège, Belgium

[www.nanochem.ulg.ac.be](http://www.nanochem.ulg.ac.be)

[asduwez@uliege.be](mailto:asduwez@uliege.be)

### Biography

Anne-Sophie Duwez obtained her PhD in chemistry in 1997 at the University of Namur. She then joined the University of Louvain as a FNRS postdoctoral researcher. From 2002 to 2003, she was visiting scientist at the Max Planck Institute in Mainz, Germany. She then returned to the University of Louvain as a senior scientist to develop single-molecule force spectroscopy by AFM. In 2006, she was appointed associate professor at the University of Liège and obtained an Incentive Grant for Scientific Research from the FNRS to create a new laboratory for advanced AFM techniques. She is currently full professor in the Department of Chemistry. Her research focuses on the development of probes and technologies to interface single small functional molecules with AFM. Over the last decade, her group has developed the first examples of single-molecule force spectroscopy on small synthetic molecules to study their operation. She recently received the Triennial Prize (2015-2017) Agathon-De Potter for chemistry, awarded by the Royal Academy of Sciences, Letters and Arts of Belgium.

### PROBING SINGLE MOLECULES WITH AFM: FORCE, MOTION, DYNAMICS, AND FUNCTION

In 1952, Erwin Schrödinger wrote that we would never experiment with just one electron, one atom, or one molecule. [1] Forty years later, methods derived from scanning probe microscopies allowed us to manipulate single atoms and molecules, and even single bonds. [2] Single-molecule force spectroscopy, which consists in trapping and stretching a molecule between an AFM tip and a surface, enables to probe (and/or to induce) molecular processes in situ and in real time through the application of mechanical forces. Such elegant experiments have provided unprecedented insights into the structure and function of many (biological) systems. [3]

Force, dynamics, and function can now be probed at the single-molecule level, but this exploration of single entities is only in its infancy. Chemists can now play with single bonds, orient molecules and trigger a chemical reaction between single entities. Biologists and biophysicists are now able to investigate molecular-level processes involved in living organisms, such as muscle contraction, cell locomotion and division, or transport processes. Much of the exquisite and detailed information about how biomolecular machines operate has been gleaned from direct measurements made on single molecules.

Here, we will discuss some of our recent results in the field of AFM-based single molecule force spectroscopy on bio-inspired systems, like the investigation of how small binders perturb the dissociation mechanisms of DNA, single atom exchange in supramolecular polymers, the measurement of the force generated by a synthetic molecular machine and the real time capture of folding/unfolding transitions in synthetic foldamers. [4]

**Keywords:** AFM, single-molecule force spectroscopy

### References

[1] E. Schrödinger, Br. J. Philos. Sci. 1952, 3, 233.

[2] J. K. Gimzewski, C. Joachim, Science 1999, 283, 1683.

[3] E. Evans, Annu. Rev. Biophys. Biomol. Struct. 2001, 30, 105 ; C. Bustamante, Y.R. Chemla, N.R. Forde, D. Izhaky, Annu. Rev. Biochem. 2004, 73, 705 ; F. Kienberger, A. Ebner, H.J. Gruber, P. Hinterdorfer, Acc. Chem. Res. 2006, 39, 29 ; J. Liang, J. M. Fernández, ACS Nano 2009, 3, 1628 ; E. M. Puchner, H. E. Gaub, Curr. Opin. Struct. Biol. 2009, 19, 605 ; Molecular Manipulation with Atomic Force Microscopy, Edited by N. Willet and A.-S. Duwez, Taylor & Francis group – CRC Press, Boca Raton, USA, 2012, pp. 287.

[4] P. Lussis, T. Svaldo-Lanero, A. Bertocco, C.-A. Fustin, D. A. Leigh, A.-S. Duwez, Nature Nanotech. 2011, 6, 553 ; A. Van Quaethem, P. Lussis, D. A. Leigh, A.-S. Duwez, C.-A. Fustin, Chem. Sci. 2014, 5, 1449 ; A. Burmistrova, B. Fresch, D. Sluysmans, E. De Pauw, F. Remacle, A.-S. Duwez, Nanoscale 2016, 8, 11718 ; D. Sluysmans, F. Devaux, C. J. Bruns, J. F. Stoddart, A.-S. Duwez, PNAS 2018, 115, 9362 ; D. Sluysmans, S. Hubert, C. J. Bruns, Z. Zhu, J. F. Stoddart, A.-S. Duwez, Nature Nanotech. 2018, 13, 209.

# Keynote Speakers



## Eliane ESPUCHE

Professor at Claude Bernard University of Lyon

IMP Laboratory (CNRS, UDL, INSA Lyon, UCBL)

Villeurbanne, France

[www.imp.cnrs.fr](http://www.imp.cnrs.fr)

[eliane.espuche@univ-lyon1.fr](mailto:eliane.espuche@univ-lyon1.fr)

### Biography

Eliane Espuche is professor at the University of Lyon since 2003. She is member of the executive board and of the scientific committee of IMP Laboratory. She is co-head of the team “Physical Properties of Functional Polymer based-Materials”. She graduated from INSA Lyon in 1986 and defended her thesis on epoxy networks in 1989. She entered University Claude Bernard, Lyon 1 as assistant professor in 1990. Her HDR was focused on gas transport in polymers. Her current research topics concern the design of (nano)structured polymer based-materials for controlled gas and vapor transport properties as well as modeling of diffusion and solubility mechanisms in polymers, blends, (nano)composites and hybrid materials. She is one of the principal investigators of the International Associated Laboratory “Nanoporous Thermostable Polymer Materials”. She has more than 110 published papers in peer review journals, 2 book chapters and 4 patents.

### NANOCOMPOSITES ROUTES FOR IMPROVED POLYMER FUNCTION PROPERTIES: SYNTHESIS AND KEY-FACTORS

Nanocomposite approach consisting in combining a polymer matrix with nanofillers has been the subject of increased interest during the past decades due to its potential to lead to functional materials for a large variety of applications going from mechanical, optical, electrical, catalytic and gas transport applications. Among the desired function properties, barrier properties are currently of crucial importance for a wide range of domains going from packaging to building or even energy applications. To meet the requirements of these applications, polymer matrices are often combined with impermeable nanofillers.

This presentation will enlighten, from the detailed study and characterization of different selected nanocomposite film series, the particular role of the filler shape, filler location and dispersion state as well as the crucial influence of the filler/matrix interfacial properties on the barrier properties. The interest of combining different filler shapes and different nanocomposite preparation routes (e.g. preformed nanofiller dispersion and in situ generation of nanofillers) will be discussed as a way to obtain multifunctional materials. The indirect effects of fillers, such as a modification of the polymer matrix microstructure will also be investigated. Finally, the potentiality of modeling approaches based on numerical simulation techniques such as finite element method (FEM) will be demonstrated and the importance of 3D simulation strategies for the understanding and prediction of properties in the most complex nanocomposite structures will be addressed.

**Keywords:** nanocomposites, morphology and (nano)structuration, filler/matrix interfacial properties, function properties

# Keynote Speakers



## Tomáš ETRYCH

Professor at Institute of Macromolecular Chemistry CAS

Department of Biomedical polymers

Prague, Czech Republic

[www.imc.cas.cz/en/umch/o\\_biomed.html](http://www.imc.cas.cz/en/umch/o_biomed.html)

[etrych@imc.cas.cz](mailto:etrych@imc.cas.cz)

### Biography

Tomáš Etrych has completed his PhD in Polymer chemistry from Charles University in Prague, now he is a Research Professor of Polymer chemistry and head of department of Biomedical Polymers of Institute of Macromolecular Chemistry of the CAS. He has published more than 145 papers in reputed international journals and is an author of 10 patents. His research focus is based on preparation and characterization of water-soluble and micellar drug delivery systems and/or diagnostic probes for effective treatment and diagnostics of cancer and inflammatory diseases.

### TARGETED POLYHPMA-BASED NANOMEDICINES FOR CANCER AND INFLAMMATORY TREATMENT

The conjugation of small drugs with water-soluble or amphiphilic polymer carriers have several advantages, e.g. reduced drug toxicity, prolonged drug circulation in blood and higher accumulation of low-molecular-weight therapeutics in tumour tissue or inflamed tissue. The conjugation into nanomedicines enabling highly effective tumour therapy with minimized side effects.[1] One of the most studied synthetic polymer carriers are copolymers based on N-(2-hydroxypropyl) methacrylamide (HPMA).[2] The accumulation of these polymer carriers in tumour or inflamed tissue is molecular-weight dependent. Moreover, the size and shape of the polymer carriers is crucial for their biological behavior, therefore various architectures of HPMA copolymers with different molecular weight and their deep evaluation will be presented. Design, synthesis and biological evaluation of novel biodegradable micellar and/or star-like drug delivery materials based on biodegradable bisMPA, PLGA or PCL cores grafted with biocompatible HPMA copolymers will be described. The novel synthetic strategy allows adjusting the hydrodynamic diameter from 10 to 50 nm by the selection of polymer components. The tunable biodegradability of the system in aqueous buffers is based on the selection of biodegradable copolymer part. The described micellar and star polymers are suitable as drug carrier for tumor treatment, what we demonstrated by in vitro as well as in vivo evaluation. The treatment with the biodegradable star-like conjugates strongly suppressed the tumor growth and was fully curative in most of the treated animals at low doses of anticancer drug, showing better results in the case of rapidly degradable dendron-containing star polymer. All biodegradable systems shows superior efficacy over non-degradable star polymers containing non-degradable PAMAM core. Moreover, the excellent anti-tumor efficacy of the novel biodegradable star polymers makes the described star polymer suitable candidates for further preclinical development as a highly potent biodegradable stimuli-sensitive drug delivery system.

**Funding:** This work was supported by Ministry of Education, Youth and Sports of the Czech Republic within the National Sustainability Program II (Project BIOCEV-FAR LQ1604).

**Keywords:** active targeting, drug delivery, nanomedicines, EPR effect, inflammation

### References

[1] Ulbrich, K., et al., Chemical reviews 2016, 116 (9), 5338-5431.

[2] Chytil, P., et al., chapter in book "Polymers for Biomedicine: Synthesis, Characterization, and Applications", John Wiley & sons, Carmen Scholz (Editor), ISBN: 978-1-118-96657-0, 624 pages

# Keynote Speakers



## Thierry GACOIN

CNRS Research Director

LPMC Laboratory (CNRS, EP)

Palaiseau, France

[pmc.polytechnique.fr/spip.php?article436&lang=en](http://pmc.polytechnique.fr/spip.php?article436&lang=en)

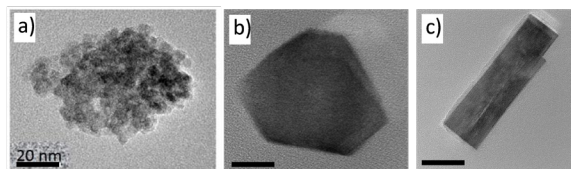
[thierry.gacoin@polytechnique.edu](mailto:thierry.gacoin@polytechnique.edu)

### Biography

Thierry Gacoin graduated from ENSCP (Materials Science) in 1990. He then joined the group of J-P Boilot for a PhD on sol-gel nanocomposites including plasmonic nanoparticles and quantum dots. He was hired by CNRS (Materials Chemistry section of the Chemistry Institute) in 1994, achieving his research in the Condensed Matter Physics Laboratory of Ecole Polytechnique. CNRS senior scientist since 2007, he is in charge of the solid state chemistry group of LPMC lab. Since 2009, he is associate professor in the physics and chemistry departments of Ecole polytechnique and dean of the chemistry department since 2018. Researches of T. Gacoin and his colleagues concern the elaboration and physical properties of nanostructured materials (thin films, nanoparticles) obtained by soft-chemistry routes (colloid and sol-gel chemistry). Main topics are related to nanomaterials with optical properties including luminescent oxide nanoparticles, plasmonic oxides, mesoporous coatings, photocatalysis and hybrid azo-materials.

### MICROSTRUCTURE ISSUES IN THE DESIGN OF COLLOIDAL OXIDE NANOPARTICLES

Elaboration of colloidal nanocrystals has a subject of intense research motivated by the investigation of original properties associated with small size and the perspective of new applications. In term of chemistry, main issues are related to the control of various parameters including particles crystallinity, size distribution, surface functionalization, dispersion in the appropriate media... Large improvements were obtained in the recent years due to the development of new elaboration processes allowing for a better control of nucleation/growth processes. Nevertheless, there are still a number of systems for which the production of well-defined particles remains an important challenge. This is the case of many oxides, especially those obtained from reactions of precipitation and which size is relatively large, typically in the 30-100 nm range. In this case, large deviations from a perfect monocrystalline state are observed, leading to particles exhibiting a more or less controlled microstructure. The characterization of this microstructure, the way it can be controlled, and its impact on the physico-chemical properties of the particles remain important questions.



TEM images of oxide nanoparticles with various microstructures (a) YAG:Ce (b) YVO4:Eu (c) WO3:Cs (scale bar : 20 nm)

The aim of this presentation is to discuss on some issues related to the microstructure of colloidal oxide nanoparticles, considering the term of microstructure as a generic qualification of the particles crystallinity and morphology at various scales. Based on examples taken from our research on luminescent and plasmonic oxides, this talk will describe how the microstructure could be characterized and modified by playing on experimental synthesis parameters, and how it can impact the properties of the particles. This will provide some directions for the design of nanocrystals microstructure in relation with targeted applications.

**Keywords:** oxide nanoparticles, microstructure, cristallinity, anisotropy, optical properties

# Keynote Speakers



## Corine GÉRARDIN

CNRS Research Director

ICGM Laboratory (CNRS, Univ. Montpellier, ENSC Montpellier)  
Montpellier, France

[www.icgm.fr/](http://www.icgm.fr/)

[corine.gerardin@enscm.fr](mailto:corine.gerardin@enscm.fr)

### Biography

Corine GÉRARDIN is currently a CNRS Director of Research at the Institute Charles Gerhardt in Montpellier. In 1991 she received her PhD degree from the University Pierre et Marie Curie, Paris. Then she worked as a post-doctoral fellow at Princeton University (NJ, USA). In 1994 she was appointed at CNRS and spent two years in Strasbourg University, France. From 1996 to 2000, she had a visiting researcher position in the United States, in Princeton University and in the mixed CNRS-Rhodia Laboratory in Cranbury (NJ, USA). In 1997 she received a Bronze Medal from CNRS for her work on the in situ hydrothermal NMR study of microporous materials. In 2001, she moved to the Institute Charles Gerhardt in Montpellier. Her main interest is the controlled synthesis of hybrid nanomaterials mediated by the use of polymers. She developed a synthesis route of colloidal polymer-stabilized inorganic particles by using double-hydrophilic block copolymers. Her present interests mainly focus on the preparation and the control of the properties of functional microporous and mesoporous materials.

### POLYMER-FUNCTIONALIZED MESOPOROUS MATERIALS: DESIGN AND PROPERTIES

Ordered mesoporous materials resulting from the synergy between supramolecular templating and sol-gel processes exhibit unique porosity and surface properties, which make them highly attractive as drug delivery systems, sensors, adsorbents or catalysts, and more generally for applications in fields as diverse as human health, environment protection and sustainable energy. Functionalization of their mesopores by organic, organometallic or biologically active functional groups can be achieved by well-controlled processes. Bringing polymer functionalities in those systems can confer new physical and chemical properties to these hybrid materials, but that remains a quite challenging task: post-functionalization routes applied on template-free porous materials hardly succeed in providing homogeneously distributed polymer chains of controlled chemical function, polymer block length and density of function. The use of polyion complex (PIC) micelles as structure-directing agents can allow overcoming the different issues related to the preparation of polymer-functionalized mesoporous materials. Polyion complex micelles are dynamic assemblies obtained by electrostatic complexation between a double-hydrophilic block copolymer (DHBC) and an oppositely charged polyelectrolyte (PE), their formation is reversible in water as a function of parameters such as pH and ionic strength. Their use for structuring silica [1-5] is highly beneficial since [1] they allow the preparation of ordered materials whose structure (2D hexagonal, lamellar, 3D spherical cubic) and pore size can be easily controlled, [2] they allow recovering and recycling the pore-generating polymers (PE) and [3] they enable the direct preparation of homogeneously distributed polymer-functionalized mesoporous structures. Another great benefit of the use of PIC micelles is that the ability of finely tuning the affinity of the corona polymer blocks for silica allows the preparation of mesoporous nanoparticles of controlled colloidal size. Finally this synthesis route could be extended to the preparation of periodic mesoporous organosilicas whose interest in biomedical applications was evidenced.

**Keywords:** mesoporous materials, nanoparticles, functionality, polymers, texture, mesophases

### References

- [1] C. GÉRARDIN et al. Chem. Soc. Rev. 2013, 42, 4217
- [2] E. Molina Langmuir 2015, 31 (47), 12839.
- [3] D. Houssein et al. Microporous and Mesoporous Materials 2017, 239, 244.
- [4] A. Birault et al ACS Appl. Bio Mater. 2018 1, 1787–1792.
- [5] E. Molina et al Beilstein J. Nanotechnol. 2019 10, 144.

# Keynote Speakers



## Yannick GUARI

CNRS Research Director

ICGM Laboratory (CNRS, Univ. Montpellier, ENSC Montpellier)  
Montpellier, France

[www.icgm.fr/imno](http://www.icgm.fr/imno)

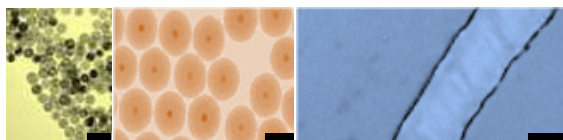
[yannick.guari@umontpellier.fr](mailto:yannick.guari@umontpellier.fr)

### Biography

Yannick Guari is head of the Molecular Engineering and Nano-Objects team at the Institut Charles Gerhardt Montpellier, University of Montpellier, France, and conducts research on metal-containing nanoparticles and nanocomposites. He earned a PhD in chemistry at the University of Toulouse in 1998. His thesis work under the supervision of Bruno Chaudret was on ruthenium complexes and their uses for the C–H bond activation. After a postdoctoral stay at the University of Amsterdam in the research group of Prof. Piet van Leeuwen, studying palladium and platinum complexes in homogeneous catalysis, Y. Guari joined the CNRS, France, as a permanent researcher in Montpellier.

### IRON OXIDE NANOPARTICLES AND NANOCOMPOSITES: THEIR BIOSAFETY AND APPLICATIONS

The role of nanoscience is currently of primary importance in the development of innovative strategies in the fields of nanomedicine and personalized medicine. Several *in vitro* studies and preclinical trials have been undertaken on a great variety of nanostructures: among these, magnetic nanoparticles represent the core of several advanced biomedical applications. Magnetic nanoparticles of novel synthesis can improve the capabilities of already existing and widely used clinical diagnostic and therapeutic techniques, like, for example, molecular imaging, magnetic fluid hyperthermia, and magnetofection, acting as contrast agents, markers, and carriers, respectively. Moreover, the possibility of new approaches to synthesize a single nanostructure with more than one function through post-functionalisation or its combination with other materials gives the opportunity to overcome the limitations of standard medicine. During this presentation, we will discuss different aspects related to the use of iron oxides magnetic nanoparticles for biomedical applications through the functionalization of these nanoparticles for magnetic resonance imaging and magneto-induced hyperthermia; the development of mesoporous iron oxide-silica core-shell nanoparticles as part of a study on the biosafety of silica nanoparticles; and the development of biocompatible polymer composites and iron oxide nanoparticles as imageable postoperative implants.



*From left to right: iron oxide nanoparticles, iron oxide-mesoporous silica core-shell nanoparticles and PLA-iron oxide nanocomposite (Scales bars = 50 nm, 100 nm, 1 $\mu$ m).*

**Keywords:** nanoparticles, nanocomposites, iron oxide, silica, PLA, MRI, biosafety, implants

# Keynote Speakers



## Sébastien LECOMMANDOUX

Professor at Bordeaux INP

LCPO Laboratory (CNRS, Bordeaux INP, UB)  
Pessac, France

[www.lcpo.fr](http://www.lcpo.fr)

[lecommandoux@enscbp.fr](mailto:lecommandoux@enscbp.fr)

### Biography

Sébastien Lecommandoux is Full Professor at the University of Bordeaux (Bordeaux-INP). He is Director of the LCPO and is leading the group “Polymers Self-Assembly and Life Sciences”. His research interests include polypeptide and polysaccharide based block copolymers self-assembly, the design of polymersomes for drug-delivery and theranostic, as well as biomimetic approaches toward design of synthetic viruses and artificial cells. He published more than 180 publications in international journal, 6 book chapters and 9 patents (2 being licenced), with over 12000 citations (h-factor 56, Google Scholar). Sébastien Lecommandoux is recipient of the CNRS bronze medal (2004), Institut Universitaire de France Junior Chair (IUF 2007), Fellow of the Royal Society of Chemistry RSC (2017), Seqens Award of the French Academy of Science (2019). He is Associate Editor of Biomacromolecules (ACS) since 2013 and in the Editorial Advisory Board of several international journals, including Bioconjugate Chemistry (ACS), Polymer Chemistry and Biomaterials Science (RSC).

### FROM BIOACTIVE POLYMERIC VESICLES TO AUTONOMOUS CELL-LIKE REACTORS

We report here an overview on the self-assembly of amphiphilic block copolymers developed at LCPO into different nanomedicines, mainly focusing on polymer vesicles, also referred as polymersomes. We pay special attention to polysaccharide and polypeptide-based block copolymer vesicles and their development in nanomedicine.[1-3] In this context, we developed over the last years synthetic strategies for the design of glycosylated polypeptides and polysaccharide-polypeptide biohybrids with controlled placement of sugar functionality. We were especially interested in designing amphiphilic copolymers able to self-assemble into well- defined micelles and vesicles that can advantageously be loaded with drugs and present a surface with multivalent presentation of bioactive saccharides or oligosaccharides. The ability of these nanoparticles for different biomedical applications, from drug-delivery to inhibitor, will be presented. [4-5]

Finally, our recent advances in using “biomimicry approaches” to design complex, compartmentalized and functional protocells will be proposed. Such a system constitutes a first step towards the challenge of structural cell mimicry and functionality, and may act in the future as an autonomous artificial cell that can sense and cure *in situ* any biological deregulation..[8-12]

**Keywords:** block copolymer, self-assembly, vesicle, drug-delivery, targeting, protocell

### References

- [1] C. Bonduelle, S. Lecommandoux. Biomacromolecules 2013, 14, 2976-2983.
- [2] Jeannot, V. et al. Nanomedicine: Nanotechnology, Biology, and Medicine 2016, 4, 921.
- [3] V. Jeannot, et al. J. Control. Release 2018, 275, 117-128.
- [4] C. Bonduelle et al. Chem. Commun. 2014, 50, 3350
- [5] H. Duan et al. Scientific Report 2018, 8:14730
- [6] M. Marguet et al. Angew. Chem. Int. Ed. 2012, 51, 1173.
- [7] R. J. R. W. Peters et al. Angew. Chem. Int. Ed. 2014, 53, 146-150.
- [8] A. Peyret et al. Angew. Chem. Int. Ed. 2017, 56, 1566-1570.
- [9] A Peyret et al. Advanced Sciences 2018, 5, 1700453
- [10] A Peyret et al. Langmuir 2018, 34,3376

# Keynote Speakers



## Denis MORINEAU

CNRS Research Director

IPR Laboratory (CNRS, Univ. Rennes 1)  
Rennes, France

[perso.univ-rennes1.fr/denis.morineau/](https://perso.univ-rennes1.fr/denis.morineau/)  
[denis.morineau@univ-rennes1.fr](mailto:denis.morineau@univ-rennes1.fr)

### Biography

Denis Morineau joined the Ecole Polytechnique (Palaiseau) as a DGA research fellow after a degree in Chemistry at the Ecole Normale Supérieure (Paris) and a PhD in Chemical-Physics at the University Paris XI (Orsay). He then worked at UCLA as a NATO-NSF research fellow and joined the CNRS at the Laboratory of Chemical-Physics (Orsay) in 1997. He is currently senior scientist at the Institute of Physics of Rennes. He was co-founding member of the Competency Cluster *C'Nano North-West* (2005-17) and head of the Dept. of Materials and Nanoscience at IPR (2012-16). Denis Morineau currently works on the physics of interfacial and nanoconfined phases including prototypical solvents, aqueous solutions, spin-crossover particles, and soft-matter. He develops methods to direct supramolecular assemblies and dynamic heterogeneities by carefully designed confining conditions. He is expert in neutron scattering methods, which are combined with in-lab spectroscopies and molecular simulation results.

### FLUIDS IN NANOPOROUS CONFINEMENT: HOW ARE THEY DIFFERENT?

Fluids confined in nanometric-sized porous geometry exhibit unique properties that have no equivalent in the corresponding bulk systems. As such, they deserve considerable interest for their potential of technological innovation. Fundamentally, emerging questions about nanoconfined fluids have motivated many studies over the last decade, opening new perspectives for basic sciences

I will explain how the control of confinement conditions, resulting in the interplay of interfacial effects and spatial restrictions, can be used to direct the structural and dynamical properties of fluids.

This approach is based on the use of carefully designed mesostructured porous materials, which are applied to study various systems including glassforming liquids [1], liquid-crystals [2], and binary solvents [3]. It relies on the combination of a number of complementary methods, both experimental and numerical, encompassing temporal and spatial windows ranging from molecular to macroscopic scales.

Overall, this talk intends to illustrate how the physics of confined fluids reveals the limits of the continuous description of matter as we approach the molecular scale.

**Keywords:** confined fluids, mesoporous media

### References

[1] PCCP, 11, 11127-11133 (2009), J. Phys. Chem. C, 120, 11049-11053 (2016)

[2] Phys. Rev. Lett., 101, 187801 (2008), App. Phys. Lett., 105, 203106 (2014), J. Chem. Phys., 141, 134902 (2014)

[3] J. Phys. Chem. C, 120, 9245-9252 (2016), J. Chem. Phys., 146, 024501 (2017), NPJ Comp. Mat., 5, 4 (2019)



# Keynote Speakers



## Fabrice RAINERI

Associate Professor at Paris University  
C2N Laboratory (CNRS, Univ. Paris Sud, Univ. Paris Saclay)  
Palaiseau, France  
[toniq.c2n.universite-paris-saclay.fr/fr/activites/sandwich/](http://toniq.c2n.universite-paris-saclay.fr/fr/activites/sandwich/)  
[fabrice.raineri@c2n.upsaclay.fr](mailto:fabrice.raineri@c2n.upsaclay.fr)

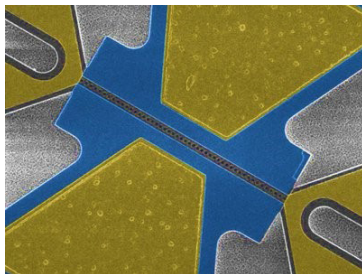
### Biography

Fabrice Raineri has been an associate professor at C2N-CNRS (former LPN) since 2005 while teaching at Paris Denis Diderot University (now Université de Paris). His PhD work (2001-2004) was on nonlinear Photonic crystals, his postdoctoral work was on CW Optical Parametric Oscillators at ICFO (Barcelona, 2005). His current research interests are focused on the investigation of optical nonlinear interactions within semiconductor micro/nanostructures and their exploitation for the achievement of optical functionalities useful for data processing. Recently, he led his work towards integrated nanophotonics with a specific effort on hybrid III-V semiconductors on Silicon structures. He has participated and worked on several national and European projects (HISTORIC, COPERNICUS, PHOXTROT, STREAMS, FUNCOMP) projects. In 2017, he was awarded with an ERC Consolidator grant. He has published more than 65 articles in peer reviewed journals, participated in many conferences (> 25 invited talk).

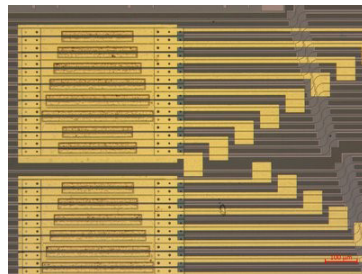
### III-V SEMICONDUCTORS ON SILICON NANOPHOTONICS

The development of compact low-power-consuming optoelectronic devices is one of the great challenges to tackle for the convergence of microelectronics and photonics. Within this context, the exploitation of nanophotonic structures such as photonic crystals is a promising road as they enable, in principle, outstanding performance.

During this talk, I will review our recent results on InP-on-Si photonic crystal devices. We exploit here a technology based on the heterogeneous integration of active III-V semiconductor heterostructures on silicon on insulator waveguide circuitries [1]. I will firstly show how these wavelength scale structures allow the achievement of CW room temperature low-threshold laser diodes efficiently coupled to Si waveguides [2]. I will also present our results on the development of hybrid optical amplifier based on this technology.



*Nanolaser*



*Nano-amplifier*

**Keywords:** nanolasers, photonic crystals, Silicon photonics

### References

- [1] T. J. Karle et al, J. Appl. Phys. 107, 63103 (2010).
- [2] G. Crosnier et al, Nature Phot. 11, 297 (2017).

# Keynote Speakers



## Hynd REMITA

CNRS Research Director

LCP Laboratory (CNRS, Univ. Paris Sud)

Orsay, France

[www.lcp.u-psud.fr/](http://www.lcp.u-psud.fr/)

[hynd.remita@u-psud.fr](mailto:hynd.remita@u-psud.fr)

### Biography

Hynd Remita is Director of Research at CNRS. She is working at the Laboratoire de Chimie Physique, Université Paris-Sud, Université Paris-Saclay.

After a PhD in Physical Chemistry at Université Paris-Sud (France), she did her post-doc. at University of Medicine of Sherbrooke, Canada. Her current research includes synthesis of Composite Nanomaterials by Radiolysis, development of nanomaterials for Solar Energy Conversion, Plasmonic Photocatalysis, Conjugated Polymer Nanostructures for Photocatalysis, Water Treatment by Photocatalysis, Fuel Cells and Nanomedicine. The goal is not only to enable the development of practical devices but ultimately, to find out the guiding principles by which the performance of a particular material is achieved. She is also devoted to dissemination of Science.

She published more than 120 research papers, 6 book chapters, 8 articles of dissemination of science and filled 14 patents. She is coordinator of a research strategic initiative (IRS) of Université Paris-Saclay MOMENTOM (Materials and Molecules for the Energy of Tomorrow).

### CONJUGATED POLYMER NANOSTRUCTURES FOR PHOTOCATALYSIS UNDER VISIBLE-LIGHT

Visible-light responsive photocatalysts can directly harvest energy from solar light offering a desirable way to solve energy and environment issues. Radiolysis a very powerful technique to synthesize efficient nanomaterials for photocatalysis such as plasmonic photocatalysts, conjugated polymer nanostructures and composite nanomaterials.

We have shown that conjugated polymers (in particular Polydiphenylbutadiyne, (PDPB) Poly(3,4-ethylenedioxythiophene (PEDOT), Poly(3-hexylthiophene) nanostructures (P3HT), and poly(pyrrole) (PPy) emerge as a new class of photocatalysts very active under visible light without the assistance of sacrificial reagents or precious metal co-catalysts.[1,2,3 4] These polymer nanostructures are synthesized in soft templates provided by hexagonal mesophases. These stable and cheap polymer nanostructures are easy to process and can be reused without appreciable loss of activity.

Addition of scavengers and mechanistic studies show that  $O_2^{\bullet-}$  is the main radical responsible for degradation of phenol taken as a model pollutant. P3HT nanostructures can easily be deposited on flat supports such as quartz for photocatalytic applications avoiding a separation step by centrifugation. The photocatalytic activity of these P3HT nanostructures is highly enhanced when they are supported on a solid surface opening new perspectives in photocatalytic reactors and self-cleaning surfaces.[3]

PDPB nanostructured conjugated polymers when dispersed in water, and in the absence of sacrificial agents or co-catalysts can perform photocatalytic water oxidation under visible light excitation.

Our results demonstrate that conjugated polymer nanostructures offer the perspective of development of a new generation of efficient and cheap visible light driven photocatalysts for environmental protection. These polymer nanostructures can also find applications in self-cleaning surfaces and water splitting.

**Keywords:** photocatalysis, conjugated polymer nanostructures, water treatment, water oxidation, hydrogen generation

### References

[1] S. Ghosh et al. Nature Materials, 14, 505 – 511, 2015.

[2] S. Ghosh et al. Sci. Rep. 5, 18002, 2015.

[3] D. Floresyona et al. Appl. Catal. B Env. 209, 23-32, 2017.

[4] X. Yuan et al. Appl. Catal. B Env. 239, 362–372, 2019.

# Keynote Speakers



## Philip SCHULZ

CNRS Research Director

IPVF Laboratory (CNRS, EP, Chimie ParisTech, EDF, Air Liquid, Total SA, IPVF)  
Gif-Sur-Yvette, France

[www.ipvf.fr/en](http://www.ipvf.fr/en)

[philip.schulz@cnrs.fr](mailto:philip.schulz@cnrs.fr)

### Biography

Philip Schulz holds the position of Directeur de Recherche at the Centre National de la Recherche Scientifique (CNRS) and pursues his research activities at the Institut Photovoltaïque d'Île-de-France (IPVF) located on the Paris Saclay campus. There, he leads the Interfaces and Hybrid Materials group installed through a Young Investigator award in the "Make Our Planet Great Again" initiative of President Emmanuel Macron of the French Republic.

Before entering CNRS in 2017, Philip Schulz has been a postdoctoral researcher at the National Renewable Energy Laboratory (NREL) from 2014 to 2017 and the Surface and Interfaces Science Laboratory at Princeton University from 2012 to 2014, where he studied interface design in organic electronics and hybrid solar cells. Philip Schulz received his Ph.D. in physics from the RWTH Aachen University in Germany in 2012, where he was awarded a DAAD fellowship to pursue part of his studies at the National Institute of Standards and Technology (NIST).

### INTERFACES AND STABILITY OF HALIDE PEROVSKITE SEMICONDUCTORS

In the past decade, halide perovskite (HaP)-based solar cells (PSC) demonstrated a remarkable breakthrough in photovoltaic performance with power conversion efficiencies exceeding 25%. HaPs mark an outstanding class of materials for photon absorption but are prone to degradation due to their hybrid organic inorganic character and hence volatile chemical components and reactive halide ions. While HaPs exhibit a pronounced defect tolerance and self-healing such that the electronic properties do not change considerably with the formation of defects, film degradation will eventually deteriorate the optoelectronic properties. A key strategy to substantially enhance the stability of these compounds is to modify the interfaces and thereby control the chemistry and driving force for ion migration in the perovskite film. My talk will focus on the means and developments to analyze and tailor interfaces in HaP based semiconductor devices to gain control over the electronic properties at the nanoscale and electronic coupling to adjacent functional layers.

I will further highlight the use of photoemission spectroscopy to determine the surface energetics and electronic energy level alignment at the HaP/CTL interface while at the same time tracking the interface chemistry. This approach, complemented by optical spectroscopy and mass spectrometry techniques, enables us to evaluate band offsets in the layer system in face of chemical interactions and changes in the electrostatic potential at the interfaces. The results not only suggest guidelines on how to integrate CTLs into PSCs but also explain more generally to what extent the electronic structure of the perovskite is subject to extrinsic perturbations and would ultimately pertain to stability concerns in devices [3].

I will conclude my talk by further exemplifying how surface treatment and interfacial design routes can be employed to achieve record power conversion efficiencies in HaP-based quantum dot solar cells. Therein, our approach is driven by a targeted ligand exchange chemistry [4].

**Keywords:** interfaces, photoemission spectroscopy, halide perovskites, photovoltaics

### References

- [1] P. Schulz, ACS Energy Lett. 3, 1287-1293 (2018)
- [2] P. Schulz, D. Cahen, A. Kahn. Chem. Rev. 119, 3349-3417 (2019)
- [3] J.A. Christians, et al., Nature Energy 3, 68-74 (2018)
- [4] L.M. Wheeler, et al. J. Am. Chem. Soc. 140, 10504 (2018)

# Keynote Speakers



## Tanja WEIL

Director at the Max Planck Institute for Polymer Research

Synthesis of Macromolecules

Mainz, Germany

[www.mpip-mainz.mpg.de/weil](http://www.mpip-mainz.mpg.de/weil)

[weil@mpip-mainz.mpg.de](mailto:weil@mpip-mainz.mpg.de)

### Biography

Tanja Weil joined the Max Planck Institute for Polymer Research (MPIP) in 2017 as one of the Directors. She studied chemistry (1993–1998) at the TU Braunschweig (Germany) and the University of Bordeaux I (France) and completed her PhD at the MPIP under the supervision of K. Müllen. In 2003, she received the Otto Hahn Medal of the Max Planck Society. From 2002 to 2008 she managed different leading positions at Merz Pharmaceuticals GmbH (Frankfurt) such as Director of Chemical Research and Development. In 2008, she accepted an Associate Professor position at the National University of Singapore. Tanja Weil joined Ulm University as Director of the Institute of Organic Chemistry III from 2010 - 2016.

She has received e.g. a Synergy Grant of the European Research Council (ERC) and the science award of the city of Ulm. Tanja Weil is an associate editor for ACS Nano, a member of the editorial advisory board of J. Am. Chem. Soc. and of the Kuratorium of Angewandte Chemie.

### BIOMATERIALS INSPIRED BY NATURE TO SOLVE MEDICAL CHALLENGES

Nature serves as source of inspiration for the design of polymeric materials. The generation of sophisticated polymeric materials of comparable dimensions, structural precision and functionality as cellular biopolymers will be presented to ultimately control the fate and biochemical pathways of living cells, which has great relevance for fundamental research and biomedicine.

We combine peptides, proteins and polymers to construct polymeric biomaterials with high degree of structure definition that are able to interact with cells in a controlled fashion. The formation and disassembly of nanostructures is induced by environmental stimuli. In this way, synthetic extracellular matrices are prepared that stimulate the growth of neuronal cells in vitro and in vivo. Synthetic extracellular nanostructures also bind virions and boost the invasion of virus particles into cells, which could be applied for retroviral gene therapy. Moreover, nanostructures are also formed inside cellular environments, which has important implications for cell viability.

In my lecture, I will present the design and synthesis of polymeric biomaterials inspired by Nature and I will highlight their applications for nerve regeneration, gene therapy as well as tumor targeting.

**Keywords:** peptide-polymer nanomaterials, nerve regeneration

### References

- [1] J. Gacanin, et al. (2019). Biomedical Applications of Nucleic Acid-Based Hydrogels. *Adv. Funct. Mater.* DOI: 10.1002/adfm.201906253
- [2] M. Hebel et al. (2019) Sequence Programming with Dynamic Boronic Acid/Catechol Binary Codes. *J. Am. Chem. Soc.* 141, 36, 14026-14031.
- [3] C. Schilling et al. (2019). Sequence-Optimized Peptide Nanofibers as Growth Stimulators for Regeneration of Peripheral Neurons, *Adv. Funct. Mater.* 29, 24, 1809112.
- [4] J. Gačanin et al. (2019) Autonomous Ultra-Fast Self-Healing Hydrogels by pH-Responsive Functional Nanofiber Gelators as Cell Matrices. *Adv. Mater.* 31, 2, 1805044.







# **SATELLITE EVENTS**

*Events in French*

# Table ronde grand public

Mardi 10 décembre 2019 - 18h30

Amphithéâtre Romanée-Conti

Les recherches sur les nanosciences ont conduit à des avancées scientifiques et des développements technologiques remarquables qui répondent aux attentes économiques et sociétales actuelles. Qu'en est-il aujourd'hui des innovations et du transfert de technologie au niveau industriel ? Quels sont les enjeux stratégiques et les schémas de développement responsable des nanotechnologies pour la santé, l'énergie et l'environnement ? Quels seront les nanomatériaux de demain qui changeront nos vies ?

Trois personnalités scientifiques, reconnues pour leur activité dans le domaine des nanosciences et des nanotechnologies, seront réunies pour présenter leur expérience en matière d'innovation et échanger sur leur vision de la valorisation à l'interface académie-industrie.



**Claire AUPLAT**

Professeure

Université Paris Dauphine - DRM

[claireauplat.com](http://claireauplat.com)

[claire.auplat@dauphine.psl.eu](mailto:claire.auplat@dauphine.psl.eu)

Claire Auplat, professeur HDR, est chercheuse en management de l'innovation et spécialiste des questions institutionnelles et industrielles liées au développement durable des nanotechnologies. Titulaire d'un doctorat en politiques et institutions anglophones de la Sorbonne, d'un PhD en management de l'innovation d'Imperial College (GB) et d'une HDR en gestion de Paris-Dauphine, elle a travaillé successivement à l'université de Rice (US), puis dans différentes institutions en France et au Royaume-Uni, et enfin à l'Université Paris-Dauphine PSL en tant que co-responsable de sa House of Public Affairs. Ses domaines d'intérêt couvrent les politiques publiques et les dynamiques entrepreneuriales, la gestion stratégique de l'innovation, les risques émergents et l'approche Safer by Design. Ses travaux ont donné lieu à de nombreuses publications et elle participe régulièrement à des comités d'évaluation de projets ANR dans le champ de l'innovation technologique et du développement durable.



**Lauriane D'ALENÇON**

Chercheuse senior

Solvay

[lauriane.dalencon@solway.com](mailto:lauriane.dalencon@solway.com)

Lauriane d'Alençon est diplômée de l'ENSCP en 2003 et a ensuite réalisé une thèse à l'Ecole Polytechnique sur des Conducteurs Ionomères Hybrides. Embauchée chez Solvay (Rhodia) en 2006 comme ingénieur de recherches en synthèse inorganique au centre de recherches d'Aubervilliers, elle a travaillé pour deux « Business Units » différentes (Silices puis Terres Rares) sur des projets d'industrialisation de nouveaux produits inorganiques dans les domaines de la catalyse, de l'électronique ou du renfort pneumatique. Elle a ensuite évolué vers un laboratoire Corporate pour définir et mettre en place de nouveaux projets. Aujourd'hui experte en synthèse de matériaux inorganiques de l'échelle nanométrique à l'échelle micronique, elle est responsable du Cluster Chimie Inorganique et Hybride du laboratoire des matériaux inorganiques fonctionnels. Elle est également chef de projet pour le développement de produits dans le domaine du stockage de l'énergie.



**Elias FATTAL**

Professeur

Université Paris Sud - IGPS

[umr-cnrs8612.u-psud.fr](http://umr-cnrs8612.u-psud.fr)

[elias.fattal@u-psud.fr](mailto:elias.fattal@u-psud.fr)

Elias Fattal est Professeur de Pharmacotechnie à l'Université Paris-Sud et a présidé l'Association de Pharmacie Galénique Industrielle de 2003 à 2010. Diplômé Pharmacien, il a obtenu le diplôme de Docteur de l'Université Paris-Sud en 1990 et a été pendant 2 années Post-Doctorant à UCSF aux USA. Il dirige l'Institut Galien Paris-Sud (2010-2019). Il est l'auteur de plus de 280 articles scientifiques ou chapitres de livre. Il a déposé 14 familles de brevets, dont plusieurs ont fait l'objet de licences. Il est le co-inventeur d'un adjuvant capable de réduire la résistance aux antibiotiques en adsorbant la partie résiduelle au niveau du côlon (Da Volterra- phase clinique II). Un de ses brevets a conduit au Calixarene® Cevidra, une crème pour le traitement de la contamination externe en actinides. Elias Fattal a reçu le PSWC Research Achievement (2007), le CRS fellow Award (2016). Il a été récompensé en 2016 par l'Académie des sciences et en 2018 par le prix Maurice-Marie Janot.



# Conférence sur le « safer by design »

## Vendredi 13 décembre 2019 - Amphithéâtre de l'ESIREM

- 08:45** Accueil par Sandrine Gauffinet, Directrice adjointe de l'ESIREM (9 avenue Alain Savary, 21 000 Dijon)
- 09:00** Présentation de la journée  
Corinne CHANEAC, Professeure à Sorbonne Université - LCMCP, Directrice du C'Nano - CNRS, Paris  
Bernard CATHALA, Directeur de recherche à l'INRA - BIA, Nantes
- 09:15** Présentation du LabEx SERENADE et introduction au « safer by design »  
Jérôme ROSE, Directeur de Recherche CNRS - CEREGE, Directeur du LabEx SERENADE, Aix-en-Provence
- 09:45** Exposure driven risk assessment  
Mélanie AUFFAN, Directrice de Recherche CNRS - CEREGE, Aix-en-Provence
- 10:15** Pause Café
- 10:30** Innover en entreprise : les défis du « safer by design » pour les nanos  
Claire AUPLAT, Professeure à l'Université Paris Dauphine- DRM, Paris
- 11:00** Introduction aux approches toxicologiques et mécanistiques des interactions entre nanomatériaux et vivant  
Thierry RABILLOUD, Chercheur au CNRS - LCBM, Grenoble
- 11:30** Safer-by-design approach for nanoparticles at the research stage: the example of metal oxysulfides  
Sophie CARENCO, Chercheuse au CNRS - LCMCP, Paris
- 12:00** Hybrides nanoTiO<sub>2</sub> / nanocristaux de cellulose : une alternative au TiO<sub>2</sub> pour les applications peinture et crème solaire  
Hugo VOISIN, Chercheur post-doctorant à l'INRA - BIA, Nantes
- 12:30** Déjeuner

Organisée par :



Soutenue par :







# PhD Thesis Awards

# PhD Thesis Awards

## Fundamental research

---



### **William LEGRAND**

Unité Mixte de Physique CNRS/ Thales  
Paris Sud / Paris Saclay University

*Crafting magnetic skyrmions at room temperature : size, stability and dynamics in multilayers*

PhD thesis director: Vincent CROS (CNRS)

PhD thesis supervisor: Nicolas REYREN (CNRS)



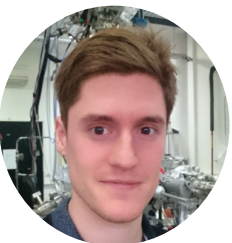
### **Ida LUCCI**

FOTON Laboratory (CNRS, INSA Rennes, Univ. Rennes 1)  
IPR Laboratory (CNRS, Univ. Rennes 1)  
INSA Rennes

*Surface and interface contributions to III-V/Si hetero-epitaxial growth: Theory and Experiments*

PhD thesis director: Charles CORNET (INSA Rennes)

PhD thesis supervisors: Laurent PEDESSEAU (INSA Rennes) & Pascal TURBAN (Univ. Rennes)



### **Benjamin VERLHAC**

IPCMS Laboratory (CNRS, Univ. Strasbourg)  
University of Strasbourg

*Atomic-scale spin-sensing with a single molecule at the apex of a scanning tunneling microscope*

PhD thesis director: Laurent LIMOT (CNRS)

## Applied research

---



### **Claire DAZON**

MADIREL Laboratory (CNRS, Univ. Aix-Marseille)  
Aix-Marseille University

*Workplace exposure to nanomaterials during powder handling: Relationships between powder properties and airborne particle characteristics*

PhD thesis director: Philip LLEWELLYN (CNRS)

PhD thesis supervisor: Olivier WITSCHGER (INRS)

## Interdisciplinary research

---



### **Noémie DANNÉ**

LP2N Laboratory (CNRS, IOGS, Univ. Bordeaux)  
University of Bordeaux

*Single carbon nanotubes tracking to measure the rheological properties of complex environments: application in neuroscience*

PhD thesis director: Laurent COGNET (CNRS)



### **Bertille MARTINEZ**

INSP Laboratory (CNRS, Univ. Sorbonne)  
Sorbonne University

*Electronic properties of narrow band gap colloidal nanocrystals : application to infrared nanocrystals*

PhD thesis director: Emmanuelle LACAZE (CNRS)

PhD thesis supervisor: Emmanuel LHUILLIER (CNRS)

## Nanomedicine research

---



### **Alexandre BORDAT**

IGPS Laboratory (CNRS, Univ. Paris-Sud / Paris Saclay)  
Paris Sud / Paris Saclay University

*Alternative strategies for the delivery of anticancer drugs by physical encapsulation in thermoresponsive polymer nanoparticles or chemical coupling as polymer prodrugs*

PhD thesis director: Nicolas TSAPIS (CNRS)

PhD thesis supervisor: Julien NICOLAS (CNRS)

## C'Nano - SFNano

---



### **Max PIFFOUX**

MSC Laboratory (CNRS, Univ. of Paris)  
University of Paris

*Physical and interdisciplinary approaches of the extracellular vesicle field : new tools and techniques toward clinical translation in regenerative medicine and drug delivery*

PhD thesis director: Amanda SILVA BRUN (CNRS)

PhD thesis supervisor: Florence GAZEAU (CNRS)





# LIST OF POSTERS

# List of Poster Presentations

## P1 - NANOPARTICLES & TARGETING

P1-01	In vivo targeting PSMA expressing cells in prostate cancer with scFv functionalized nanoparticles	Clément VECCO-GARDA • ENSCR - ICMCB, France
P1-02	Copper based nanoparticles synthesis	Alexandre GUYONNET • Univ. Bordeaux 1 - ICMCB, France
P1-03	Influence of shea butter amount on the properties of calcium-pectin microparticles	Odile CHAMBIN • Univ. of Bourgogne - PAM, France
P1-04	Preparation of omega-3 polyunsaturated fatty acid-rich cholesteryl esters and triglycerides in nanoemulsions for intranasal delivery in AMD	Glenda VASKU • AgroSup Dijon - CSGA, France
P1-05	Intestinal Alkaline Phosphatase Triggered Zeta Potential Changing Nanoparticles across Mucus and Epithelial Barriers	Zeynep AKKUS • Univ. of Innsbruck - CCB, Austria
P1-06	Encapsulating chlorpromazine in cyclodextrin-liposomes for treatment of myeloid malignancies	Edvin GUNDERSEN • Univ. of Bergen - Dpt of Clinical Science, Norway
P1-07	Ultrabright fluorescent dye-loaded polymeric nanoparticles for targeting lipids and proteins	Caterina SEVERI • Univ. of Strasbourg - LBP, France
P1-08	Impact of the inner structure of maltodextrin nanoparticles on the development of a mucosal vaccine	François FASQUELLE • Univ. of Lille - LIRIC, France
P1-09	Effect of the NFL peptide on canine glioblastoma	Audrey GRIVEAU • Univ. of Angers - MINT, France
P1-10	Study of mechanisms allowing nanomedicines to treat inflammatory bowel disease	Norhane SALAH • Univ. of Lille - LIRIC, France
P1-11	Actively targeted HPMA copolymer-based nanoprobe for head and neck cancer imaging	Robert POLA • IMC - CAS, Czech Republic
P1-12	Mucopenetrating liposomes with CD44 targeting ability as a platform for the treatment of fibrotic and cancer lung disease	Alessandro MARENGO • Univ. of Paris Sud - IGPS, France
P1-13	Tailored polysaccharides based nanogels as boron delivery systems for boron neutron cancer therapy	Simon CONINX • CNRS - CERMAV, France
P1-14	Evaluation of cationic and neutral liposomes' uptake by human villous placental explants	Louise FLIEDEL • Univ. Paris Descartes - UTCBS, France
P1-15	Reproducible production of liposomes by an automated microfluidic based apparatus	Kairallah ALHARETH • Univ. Paris Descartes - UTCBS, France
P1-16	The influence of stroma content on the behavior of liposomal-based Temoporfin formulation in 3D tumor spheroids	Ilya YAKAVETS • Belarusian State Univ./ Univ. Lorraine - CRAN & ICL, France
P1-17	Characterization of cationic liposome formulated by microfluidization combined with thin film method	Xiaojing LIU • Univ. Paris Descartes - UTCBS, France
P1-18	Cubic liquid crystalline nanostructures involving catalase and curcumin: A BioSAXS study and bioassays with neuronally derived cells	Miora RAKOTOARISOA • Univ. Paris Sud/ Paris Saclay - IGPS, France
P1-19	Designing A Novel Nanocarrier For combining the delivery of siRNA and Glucocorticoids in The Treatment Of Atopic Dermatitis	Serra GURCAN • Univ. Paris Sud/ Paris Saclay - IGPS, France
P1-20	Cell penetrating peptides to improve magnetic nanoparticles cellular uptake	Mathilde LE JEUNE • Sorbonne Univ. - PHENIX, France
P1-21	Is dynamic light scattering a good method to characterize self-assemblies of cell penetrating peptide-ferrocifen conjugates?	Elise LEPELTIER • Univ. of Angers - MINT, France
P1-22	Antioxidant properties and improved bio-compatibility of cerium oxide nanoparticles with innovative polymer coating	Caroline ROQUES • Univ. of Angers - MINT, France
P1-23	Magnetic particles for magneto-mechanical treatment of glioblastoma cells	Caroline THEBAULT • CEA - SPINTEC, France
P1-24	Synthesis of polyplexes with double hydrophilic block copolymers IPEI-b-POx for gene delivery	Gwendoline DELECOURT • Sorbonne Université - IPCM, France
P1-25	Impact of mucus on gene delivery efficacy by phospholipid carriers in the lung	Thomas SONNTAG • Univ. of Strasbourg - CAMB, France
P1-26	Development of hybrid liposome/poloxamer nano-particles to delay hydrophilic drug delivery by thickening the interior core of liposomes	Shayan AHMED • Univ. Paris Descartes - UTCBS, France
P1-27	New generation of glioblastoma-targeted lipid nanocapsule hydrogel: a sustained and specific drug delivery system	Guillaume BASTIAT • Angers Univ - MINT, France
P1-28	Design of nanocarriers based on biocompatible polymers to encapsulate	Clarisse BROSSARD • CNRS - ISCR, France
P1-29	Biomimetic pulmonary surfactant significantly reduces nanoparticles uptake by alveolar epithelial cells	Milad RADIOM • Univ. Paris Diderot - MSC, France



## P2 - NANOSCIENCE FOR CANCER

P2-01	A comparative study of the encapsulation of pentamidine into lipid and polymer nanocarriers	Barbara STELLA • <i>Università di Torino - Dipartimento di Scienza e Tecnologia del Farmaco, Italy</i>
P2-02	Tuning self-assemblies morphologies by variation of the phospholipids polar heads: the case of the vitamin B2 (riboflavin)	Jonathan RIBES • <i>Univ. of Bordeaux - CBMN, France</i>
P2-03	Induction of a strong and persistent antitumor immune response using liposomal vaccines in the HPV-transformed orthotopic lung tumor...	Béatrice HEURTAULT • <i>Univ. of Strasbourg - CAMB, France</i>
P2-04	Preclinical evaluation of a paclitaxel nanoprodrug for glioblastoma therapy	Noé DUMAS • <i>Aix Marseille Univ. - INP, France</i>
P2-05	Low Energy Electron Dissociative Attachment to DNA: an Experimental and Theoretical Study	Norhan OMAR • <i>Univ. of Bourgogne - Chrono-environnement Lab, France</i>
P2-06	Influence of PEGylation on the in vivo behavior of radiosensitizing gold nanoparticles	Inaya DABAJA • <i>Univ. of Bourgogne - UTINAM, France</i>
P2-07	A 3D model of lung cancer for in vitro preclinical prediction of in vivo behavior of nanoMOFs	Vincent PAUTU • <i>Univ. Paris Sud/ Paris Saclay - IGPS, France</i>
P2-08	In vitro and in vivo assessment of magnetic particles for magneto-mechanical glioblastoma treatment	Robert MOREL • <i>CEA - SPINTEC, France</i>
P2-09	Platinum nanoparticles to impair radiation-resistance in breast cancer stem cells: From physical theory to applied biology	Marie HULLO • <i>CEA - LCE, France</i>
P2-10	Design and development of thiolated graphene oxide nanosheets for brain tumor targeting	Ajinkya NIKAM • <i>Dpt of Pharmaceutics, Manipal College of Pharmaceutical Sciences, India</i>
P2-11	Polymeric nanoparticles: microfluidics parameters influencing encapsulation of oncology drug	Mathilde LORSCHIEDER • <i>Ipsen Innovation, France</i>
P2-12	Combination of HSP70 inhibition with Magnetic Hyperthermia promotes synergistic anti-tumoral activity	Véronique GIGOUX • <i>INSERM - RCTC / LPCNO, France</i>
P2-13	Delivery of siRNA to Ewing sarcoma tumor xenografted on mice, using hydrogenated detonation nanodiamonds: treatment efficacy and...	Jean-Rémi BERTRAND • <i>INSERM - VTA, France</i>
P2-14	Dynamic processes induced on cell membrane models by photodynamic therapy	Laure GIBOT • <i>CNRS - IMRCP, France</i>
P2-15	SPION-mediated hyperthermia: which administration route for an efficient minimally invasive, multimodal tumor treatment ?	Olivier JORDAN • <i>Univ. of Genève - ISPSO, Switzerland</i>
P2-16	Turning poorly vascular tumors into highly vascular tumors with nanoparticles: pharmacometric analysis	Raphaëlle FANCIULLINO • <i>AMU - SMARTc, France</i>
P2-17	Co-encapsulation of fisetin and cisplatin into liposomes: optimization of formulation and process and in vitro evaluation	Morgane RENAULT-MAHIEUX • <i>APHP - UTCBS, France</i>
P2-18	Hybrid Conjugates of Gold Nanorods: A Drug-Delivery Vehicle for Targeted Photodynamic Therapy	Zahraa YOUSSEF • <i>CNRS - ICSN, France</i>

## P3 - BIO-INSPIRED NANOSYSTEMS

P3-01	Evaluation of mesenchymal stem cells derived small extracellular vesicles as a vector for intracellular protein delivery	Marie MORILLE • <i>Univ. of Montpellier - ICGM</i>
P3-02	Controlled Assembly of Gold Nanoparticles With Quaternized Chitosan for Photothermal Therapy	Florent VOISIN • <i>Univ. of Paris - MSC, Paris</i>
P3-03	Tailoring structural properties of nanoemulsion-loaded chitosan scaffold for sustained intestinal delivery	Annalisa ROSSO • <i>Univ. Claude Bernard of Lyon - LAGEPP, France</i>
P3-04	Comparing detergent micelles and polymer nanodiscs for solubilization and purification of the integral membrane protein Vesicular...	Fredrik Gullaksen JOHANNESSEN • <i>Univ. of Bergen - Dpt of Biomedicine, Norway</i>
P3-05	Nanostructured cantilevers for detection of organophosphorus compounds	Jean-Philippe BRACH • <i>ISL - NS3E, France</i>
P3-06	The use of biocompatible Cyclosporine A loaded nanosystems ameliorates murine experimental colitis	Thomas ANTOINE • <i>Univ. of Bourgogne Franche - Comité - PEPITE, France</i>
P3-07	A study of the properties of the D-Mannose in the natural treatment of urinary infections caused by E- Coli	Sekkal NEZHA • <i>University of Djillali Liabes - LGCE, Algeria</i>

# List of Poster Presentations

## P4 - NANO FOR IMAGING, DIAGNOSIS AND THERANOSTICS

P4-01	Fluorescent biocompatible nanohydrogels for Gd chelates encapsulation: polymer design, nanogel syntheses and in vitro...	Juliette MOREAU • <i>Univ. Reims Champagne-Ardenne - ICMR</i>
P4-02	Evaluation of polyrotaxanes as novel contrast agents designed against arthritis by engineering of dynamic MRI	Sarah BOUMATI • <i>Univ. of Paris - UTCBS, France</i>
P4-03	Cellular uptake of perfluorocarbon nanodroplets: a potential nanocarrier for ultrasound-mediated drug deliver	Marie-Anne ESTEVE • <i>Aix Marseille Univ - INP, France</i>
P4-04	Influence of PEGylation on the in vivo behavior of radiosensitizing gold nanoparticles	Inaya DABAJA • <i>Univ. of Bourgogne - UTINAM, France</i>
P4-05	Antibody conjugates with fluorescently labeled HPMA polymers for cell analysis	Julia KUDLACOVA • <i>IMC - CAS, Czech Republic</i>
P4-06	Controlling Size and Fluorescence of Dye-Loaded Polymer Nanoparticles through Polymer Design	Andreas REISCH • <i>Univ. of Strasbourg - LBP, France</i>
P4-07	Subcellular-resolved mouse organ distribution of fluorescent nanodiamonds covalently functionalized with a cationic...	François TREUSSART • <i>ENS Paris Saclay - LAC, France</i>
P4-08	Femtomolar detection of nucleic acid based on functionalized gold nanoparticles	Marc LAMY DE LA CHAPELLE • <i>Univ. of Le Mans - IMMM, France</i>
P4-09	Novel manganese complexes based on a cyclen derivative: synthesis and relaxometric characterization	Marie DEVREUX • <i>Univ. of Mons - Dpt of general, organic and biomedical chemistry</i>
P4-10	Old story, new results: properties of fluorescent labels and visualization of PLGA nanoparticles	Vasilisa ZHUKOVA • <i>Univ. of Strasbourg - Neurosciences, France</i>
P4-11	Iron oxide nanoparticle-based MRI-PET double imaging contrast agents	Julien BOUDON • <i>Univ. of Bourgogne Franche-Comté - ICB, France</i>
P4-12	Zwitterionic Stealth Dye-loaded Polymer Nanoparticles for Intracellular Imaging	Anne RUNSER • <i>Univ. of Strasbourg - LBP, France</i>
P4-13	Shortwave infrared emitting QD-gold nano-assemblies for in vivo pH imaging	Thomas PONS • <i>INSERM - LPEM, France</i>
P4-14	Theranostic ultra-small gold nanoparticles for integrated PET/MR imaging	Alix DESHOTEL • <i>Univ. of Bourgogne Franche-Comté - UTINAM, France</i>

## P5 - NANO-OBJECTS IN BIOLOGICAL FLUIDS

P5-01	Exploring the sensitivity of NanoBioAnalytical platform for analysis of biological extracellular vesicles: How far we can push?	Céline ELIE-CAILLE • <i>Univ. Franche Comte - FEMTO-ST, France</i>
P5-02	Deciphering the structure of multimers and nanostructures of $\alpha$ -synuclein using coarse grained molecular dynamics	Adrien GUZZO • <i>Univ. Bourgogne Franche-Comté - ICB, France</i>
P5-03	Towards a novel biocompatible probe allowing for real-time temperature measurements at cellular scale	Lise ABIVEN • <i>Sorbonne Univ. LCMCP, France</i>
P5-04	Antigen Presenting Cells (APCs) functions after exposure to nanoparticles	Arindam DEY • <i>Univ. of Grenoble- Alpes - IAB, France</i>

## P6 - NANOCHEMISTRY : SYNTHESIS AND FUNCTIONALIZATION OF NANOSYSTEMS FOR BIOAPPLICATIONS

P6-01	Characterization of OSA modified pectin solutions at a nanoscale level	Odile CHAMBIN • <i>Univ. of Bourgogne - PAM, France</i>
P6-02	Surface modification of carbon quantum dots: fine tuning of antibacterial activity	Elizaveta SVIRIDOVA • <i>National Research Tomsk Polytechnic University - RSCABS, Russia</i>
P6-03	Development of pullulan-based cationic nanoparticles for the delivery of miRNA	Fernanda MORAES • <i>Univ. of Paris - LVTS, France</i>
P6-04	Synthesis by polyol and characterization of iron oxide nanoparticles soluble in water	Sendos DARWISH • <i>Univ. of Paris - ITODYS, France</i>

P6-05	Engineering of magnetic silica nanoplatfoms for the remote delivery of therapeutics under alternating magnetic field	Alexandre ADAM • Univ. of Strasbourg - IPCMS, France
P6-06	Protein-based nanoparticles as protein carrier: Synthesis, characterization, and antibacterial application	Mohamad TARHINI • Univ. Claude Bernard of Lyon - LAGEPP, France
P6-07	Magnetic Cationic Liposomes for Nucleic Acid Delivery	Do Hai DOAN • Univ. of Paris - UTCBS, France
P6-08	Influence of PEGylation on the in vivo behavior of radiosensitizing gold nanoparticles	Inaya DABAJA • Univ. of Bourgogne - UTINAM, France
P6-09	Self-assemblies of azacitidine prodrug: an innovative therapy against myelodysplastic syndromes	Milad BAROUD • Univ. of Angers - MINT, France
P6-10	Superferrimagnetic curcumin derivated nanodispersion for magnetic fluid hyperthermia	Marina COUPEAU • Univ. of Nantes - CEISAM, France
P6-11	Thermoresponsive, biodegradable polymer nanoparticles for hyperthermia-triggered drug delivery	Justine JAKPOU • Univ. of Paris Sud - IGPS, France
P6-12	Continuous flow synthesis of iron oxide nanoparticles : experimental parameters influencing the size and magnetocrystalline properties	Thomas VANGIJZEGEM • Univ. Of Mons - Dpt of general, organic & biomedical chem., NMR and molecular, Belgium
P6-13	Assembly of Lipid-Core/Polymer Shell Hybrid Nanoparticles Assessed by Fluorescence Labeling	Sophie BOU • Univ. of Strasbourg - LBP, France
P6-14	Functionalized silica stellate nanoparticles for iron capture as an option of diseases treatment	Paula RAMIREZ DUENAS • ECPM - IPCMS, France
P6-15	Silica Nanoplatfoms as Bimodal Contrast Agents for 1H MRI and Optical Imaging	Indiana TERNAD • Univ. Of Mons - Dpt of general, organic & biomedical chem., NMR and molecular, Belgium
P6-16	Influence of the Aptamer Grafting on its Conformation and its Interaction with Targeted Protein	Marc LAMY DE LA CHAPELLE • Univ. of Le Mans - IMMM, France
P6-17	Physico-chemical characterisation of Hybrid Poly Ion complexes: towards a versatile platform for imaging applications	Jean-Daniel MARTY • Univ. Toulouse Paul Sabatier - IMRCP, France
P6-18	Multifunctional gold nanoparticles for cancer imaging and therapy	Agathe BRUDO • Sorbonne Univ. - LBM, France
P6-19	Docetaxel Gold Complex Nanoflowers: Chemo-Biological Evaluation for better Therapeutic Efficiency	Maroua BEN HADDADA • Torska, France
P6-20	Endemic Plants: From Design to a New Way of Smart Hybrid Nanomaterials for Green Nanomedicine Applications	Maroua BEN HADDADA • Torska, France
P6-20 bis	Proof of concept of plasmonic thermal destruction of surface cancers by gold nanoparticles obtained by green chemistry	Anne-Laure MOREL • Torska, France
P6-21	Combined Phototherapy and NIR Light Induced Drug Delivery to Cancer Cells Achieved by Protein Capped Carbon Nanotubes-Mesoporous	Bing LI • Univ. of Strasbourg - ICPEES, France
P6-22	Plasmonic catalysis for Suzuki-Miyaura cross coupling reaction using palladium nanoflowers	Ibrahim ABDELLAH • Univ. Paris Sud - LCP, France
P6-23	Preliminary evaluations of PSMA-targeted NIR upconverting nanoparticles for dual scintigraphic/fluorescence-guided surgery...	Axel CORDONNIER • Univ. of Clermont-Ferrand - ICCF, France
P6-24	Functionalized anisotropic gold nanoparticles for Surface Enhanced Raman Spectroscopy and bio-applications	Thomas LE NEEL • Univ. of Nantes - IMN, France
P6-25	Polynuclear Gd-chelates for targeted MRI-imaging: influence of internal structure on relaxivity performance	Volodymyr MALYTSKYI • Univ. of Reims Champagne Ardenne - ICMR, France
P6-26	Energy transfer-based DNA sensing using upconversion nanoparticles	Laura FRANCES SORIANO • CNRS - I2BC, France
P6-27	Synthesis and Characterization of Cu doped ZnO Nanoparticles	Ariunzaya TSOGOO • Univ. of Le Mans - IMMM, France
P6-28	Bola-amphiphilic dendrimers as modular nanovectors for nucleic acid delivery	Jiaxuan CHEN • Aix Marseille Univ. - CINaM, France
P6-29	Spectroscopic Characterization of Grafting and Aptamer Interactions on a Target Protein (SOD)	Rawdha DEKHILI • Univ. Paris Nord - CSPBAT, France
P6-30	Predictive tools for designing biocompatible nanoparticles and nanostructured materials	Jordan BEURTON • Univ. of Lorraine - CITHEFOR, France
P6-31	Metallic Bismuth Nanoparticles Synthesis via a Greener Process	Catherine GOMEZ • CNAM - GBCM, France
P6-32	Preparation and characterization of imatinib loaded ethylcellulose microspheres	Singh PADYA BHARATH • Dpt of Pharmaceutics - Manipal College of Pharmaceutical Sciences, India

# List of Poster Presentations

## P7 - NANOMATERIALS

P7-01	Sample preparation steps to measure the size of constituent particles by SEM	Carine CHIVAS • LNE, France
P7-02	Dimensional measurement of TiO <sub>2</sub> particles in powder form by SAXS and SEM	Najoua BOUZAKHER GHOMRASNI • LNE, France
P7-03	Synthesis, self-assembly and thermal stability of silver monodisperse nanocubes for microelectronic applications	Maxime BRONCHY • Univ. of Bordeaux - ICMCB, France
P7-04	Magnetic Nanohybrids for Active Pharmaceutical Ingredients Manufacturing	Jérémy PARIS • Synthesis of Nanohybrids, France
P7-05	MOX gas sensors obtained by mixing p-type and n-type nanostructured metal oxides for air quality sensors	Pierre FAU • Univ. Toulouse Paul Sabatier - LCC, France
P7-06	Identifying Patterns in Time Series Data: Application to Biological Peptide Translocation through single-layer MoS <sub>2</sub> Nanopores	Adrien NICOLAÏ • Univ. Bourgogne Franche-Comté - ICB, France
P7-07	Imogolite nanotubes partially transformed by decylphosphonic acid to form an interface active composite material	Fabienne TESTARD • CEA - NIMBE, France
P7-08	Microstructure impact on high temperature corrosion behavior of AISI 316L stainless steel additively manufactured by AM-SLM	Corentin SIRI • Univ. Bourgogne Franche-Comté - ICB, France
P7-09	Synthesis of a fluorinated nanoporous SAPO-34 application to the adsorption of CO <sub>2</sub>	Salima BELLATRECHE • University of Oran, Dpt of Pharmacy, Algeria
P7-10	Design and characterization of tio <sub>2</sub> -bivo <sub>4</sub> heterostructures for visible light driven photocatalysis	Drisyia KARATHUPARATHOTTATHIL • Univ. of Le Mans - IMMM, France
P7-11	Graphene oxide quantum dots synthesized from biomass wastes: white light emitting material in the solid state	Jean-Jacques GAUMET • Univ. of Lorraine - LCPA2MC, France
P7-12	Microwave-assisted functionalization and post-synthesis modification of an Aurivillius phase : an easy approach to new functional layered...	Guillaume ROGEZ • CNRS - IPCMS, France
P7-13	Core@shell nanoparticles: synthesis, properties and catalytic performances	Denis UZIO • IFPEN, France
P7-14	Elaboration, structural and optical properties of SiO <sub>2</sub> :B/SiO <sub>2</sub> multilayers	Fatme TRAD • Univ. Lorraine - IJL, France
P7-15	Lipid nanocapsules for the sustained release of therapeutic miRNA: new perspective in regenerative medicine of intervertebral disc	Brian LE MOAL • Univ. of Nantes - MINT, France
P7-16	Extra Low Density and High Porosity Conductive Silver Nanowires Aerogels	Maribel TOURON • CEA - LITEN, France
P7-17	Gold nanoclusters synthesis and functionalization aiming at properties enhancement	Victoire ASILA • Sorbonne Univ. - LCMCP, France
P7-18	Continuous hydrothermal synthesis of doped barium zirconate powder for PCFC application	Mélanie FRANÇOIS • Univ. of Bourgogne Franche-Comté - ICB, France
P7-19	Evaluation of solid lipid nanocarriers to increase peptide oral bioavailability	Camille DUMONT • Univ. Claude Bernard Lyon 1 - LAGEPP, France
P7-20	Synthesis of patchy nanoparticles for self-assembled diamond-like structure	Rawan KHALAF • Univ. of Bordeaux - CRPP, France
P7-21	Mechanical-assisted liquid exfoliation of functionalized transition metal oxide	Frédéric PAYET • Univ. of Strasbourg - IPCMS, France
P7-22	Flexoelectric coefficient of single carbon nanotubes	Raya EL BEAINOU • Univ. Bourgogne Franche-Comté - FEMTO-ST, France
P7-23	Effect of laser sintering on Al-doped ZnO thin films prepared by ink-jet printing	Olga SHAVDINA • Univ. of Orléans - GREMI, France
P7-24	Conducting polymer nanostructures for photocatalytic applications	Xiaojiao YUAN • Univ. Paris-Sud - LCP, France
P7-25	Ni-Al <sub>2</sub> O <sub>3</sub> nano-composites thin films obtained by EPD for solar energy application	Souaad HAMOUDI • Université A Mira de Béjaia, Algeria
P7-26	Nanostructured plastic scintillators for enhanced radiation detection	Djadidi TOYBOU • CEA - LIST, France
P7-27	Elaboration of silica coated gold nanorods (AuNR@SiO <sub>2</sub> ) towards versatile nanoplatforms for biomedical applications	Vincent PELLAS • Sorbonne Univ. - LRS, France
P7-28	Supramolecular Nanohybrid architectures for Optimized UpConversion through controlled enERgy migration	Lohona Kevin SORO • CNRS - IPHC - SYNPA, France
P7-29	Synthesis of Inverse patchy nanoparticles	Sharvina SHANMUGATHASAN • CNRS - CRPP, France

## P8 - NANOPHOTONICS AND NANO-OPTICS

P8-01	Fluorescence properties of self-assembled colloidal supraparticles from CdSe/CdS/CdZnS/ZnS nanocrystals at 4K	Victor BLONDOT • UVSQ - GEMaC, France
P8-02	Proposal for a spiking nanolaser	Maxime DELMULLE • Paris Sud/ Paris Saclay Univ. - C2N/ Thales, France
P8-03	Synthesis and fluorescent properties of self assembled colloidal superparticles from CdSe/CdS/ZnS nanocrystals and their...	Alexandra BOGICEVIC • ESPCI - LPEM, France
P8-04	Electrical control of the nonlinear photoluminescence of metal nanostructures	Adrian AGREDA • Univ. of Bourgogne - ICB, France
P8-05	Nanofabrication and optical characterisation of modal plasmonic cavities	Florian DELL'OVA • Univ. of Bourgogne - ICB, France
P8-06	Plasmon mediated single photon source coupling to photonic waveguide	Xiao YU • Univ. of Bourgogne - ICB, France
P8-07	Bio-detection With Whispering Quantum dots	Jana SUBHA • ESPCI Paris - LPEM, France
P8-08	Study of the photon statistics emitted by optically pumped gold nanoparticles	Konstantin MALCHOW • Univ. of Bourgogne - ICB, France
P8-09	SERS signal optimisation of gold nanocylinder on gold film	Marc LAMY DE LA CHAPELLE • Univ. of Le Mans - IMMM, France
P8-10	Plasmonic properties of gold nanocylinder on gold film	Marc LAMY DE LA CHAPELLE • Univ. of Le Mans - IMMM, France
P8-11	Size Effect on Photothermal Heat Elevation of Gold Nanoparticles: Absorption Coefficient Experimental Measurement of Gold...	Nadia DJAKER • Univ. of Paris Nord - CSPBAT, France
P8-12	Plasmon mediated interactions between fluorescent emitters: from weak to strong coupling regime	Camilo PEREZ • ESPCI Paris - Langevin Institute, France

## P9 - SURFACE, INTERFACE AND NANOCONFINEMENT

P9-01	Electrical Characterization of Nanostructures by Atomic Force Microscopy Modes: Comparison and example of application	Oleksandr SYNHAIVSKYI • EC of Lyon - INL, France
P9-02	Improved model of ionic conductivity in 2-D MoS2 nanoporous membranes	Maria-Daniela BARRIOS PEREZ • Univ. of Bourgogne - ICB, France
P9-03	Investigating effects of chain length and terminal group on the organization of thiolate Self-Assembled Monolayers (SAMs)...	Yacine MAZOUZI • Sorbonne Univ. - LRS, France
P9-04	Presentation of ICB laboratory technological platform	Michaele HERBST • Univ. of Bourgogne - ICB, France
P9-05	Role of low water dielectric constant on ionic transport in nanopores	Théo HENNEQUIN • Univ. Toulouse Paul Sabatier - LPT, France
P9-06	Silver butyl amidinate complex: an original precursor to nanostructure a carbon based electrode	Katia FAJERWERG • Univ. Toulouse Paul Sabatier - LCC, France
P9-07	Role of protein corona on nanoparticles: influence of the surface chemistry	Célia MARETS • CNRS - ICB, France
P9-08	Advanced simulations for the study of biological processes on the nanointerfaces of immunosensors	Didac MARTI • Universitat Politècnica de Catalunya, Spain
P9-09	Control of surface nanoporosity in films of polythiophene derivatives	Juan TORRAS • Universitat Politècnica de Catalunya, Spain

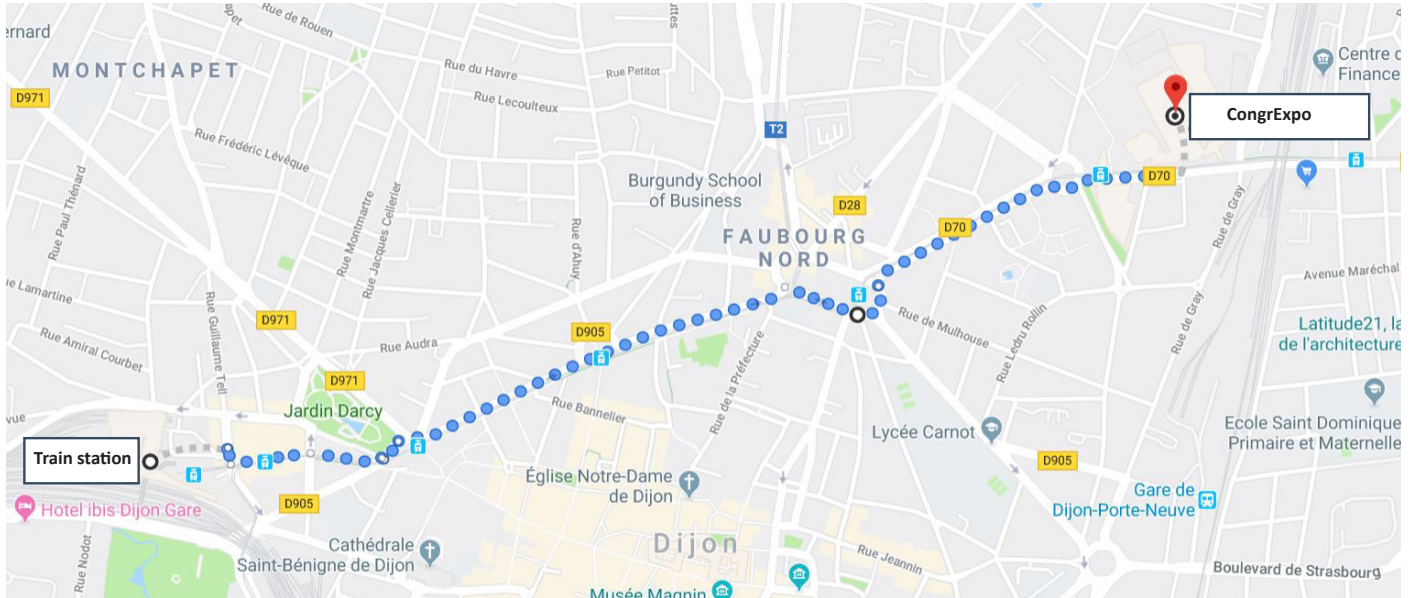




# **GENERAL** **INFORMATION**

# Maps

## Map from Dijon train station to the Congress Center



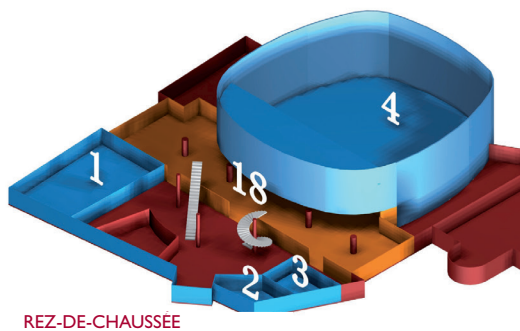
CongrExpo Adress: 3 boulevard de Champagne, 21000 Dijon

### By tramway

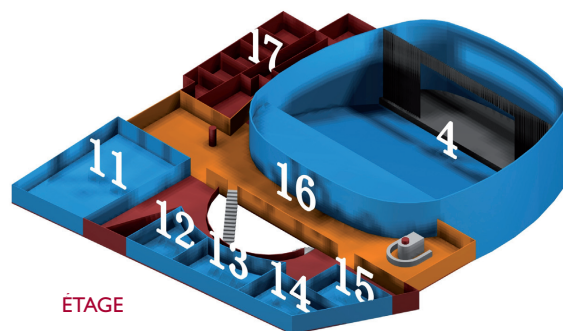
From Dijon train station, you can reach the Dijon Exhibition & Congress Center CongrExpo by Tramway Line 1. Stop at "Auditorium" station (around 5-7 min, €1.40): purchase the ticket at the tram station.

## Map of Dijon Exhibition and Congress Center

### Ground floor



### First floor



### Legend

Room number	Room name	Purpose of the room
1	Santenay-Chablis	Thematic sessions room
4	Romanée Conti Amphithéatre	Plenary & thematic sessions room
11	Morey St-Denis	Thematic sessions room
12 & 13	Givry Savigny	Thematic sessions room
18	Grands Echézeaux Hall	Coffee breaks and poster sessions area



# Gala dinner at Château de Marsannay



FOR MORE INFORMATION,  
SCAN THE QR CODE BELOW



A gala dinner\* will be organized at the Château de Marsannay Castle, located in the heart of the Burgundy vineyards, on the evening of Wednesday, December 11th (2 rue des Vignes, Marsannay-la-Côte, 21 21160).

Buses will be organized and leave at 7:00 pm from the Dijon Exhibition & Convention Center CongrExpo (3 Boulevard de Champagne, 21000 Dijon, France).

**If you appreciate the wine served during the gala dinner, please note that you will benefit from a 10% discount on wine purchase if you wish to buy some bottles!**

*\* This event is not included in registration fees: if you would like to participate, please select an extra ticket of 25€ excl. taxes (for a total cost of 86€), when you register to the congress.*



## Useful contacts

### Organizers contact information



- **Julie CARIMALO** - C'Nano Scientific & Administrative Coordinator

 +33 (0)6 63 70 39 80  [julie.carimalo@cnrs.fr](mailto:julie.carimalo@cnrs.fr)

- **Christophe DECILAP** - C'Nano Administrative Officer

 +33 (0)6 59 75 98 29  [christophe.decilap@cnrs.fr](mailto:christophe.decilap@cnrs.fr)


- **Marieke MOREL** - C'Nano Communication Officer


 +33 (0)6 69 74 33 97  [marieke.morel@cnrs.fr](mailto:marieke.morel@cnrs.fr)

### Useful addresses

- **Dijon exhibition and convention center**


3 boulevard de Champagne, 21000 Dijon


 +33 (0)3 80 77 39 00

 [dijon-congrexpo.com](http://dijon-congrexpo.com)


- **Ibis Dijon Centre Clémenceau**

2 avenue de Marbotte, 21000 Dijon

 +33 (0)3 80 74 67 30

 [hotel-ibisclemenceau-dijon.fr](http://hotel-ibisclemenceau-dijon.fr)


- **Taxis Dijon**

 +33 (0)3 80 41 41 12

- **Dijon Train Station**

31 Cour de la Gare, 21000 Dijon

 +33 (0)1 44 27 60 87  [cnano.fr](http://cnano.fr)  C'Nano

 @CNano\_national  [cnano\\_com@cnrs.fr](mailto:cnano_com@cnrs.fr)

**French national Competency Cluster in Nanoscience  
C'Nano - CNRS**

Science Sorbonne University  
4, place Jussieu, 75252 Paris Cedex 05 - BC 179  
Tower 44, 5th floor, corridor 43-44, room 518

 +33 (0)1 53 73 95 81  [sfnano.fr](http://sfnano.fr)  SFNano

 @SFNano16  [info@sfnano.fr](mailto:info@sfnano.fr)

**The French Society for Nanomedicine  
SFNano**

Faculté de Pharmacie – Sciences pharmaceutiques  
INSERM U1022 - CNRS UMR8151  
4, avenue de l'Observatoire, 75006 Paris