

CulturChem 406

2019-2020

September

Monday September 9th
Auditorium Herpin, 11h

Symposium Second Year PhD Students - JCM 2019 Second part

- **Rodrigue MARQUANT** (Laboratoire des BioMolécules)
Cysteic acid-rich peptides as bioactive glycosaminoglycan mimics
- **Laurent CATTIAUX** (Laboratoire des BioMolécules)
Supported synthesis of biological interest oligosaccharides
- **Anna NOTARO** (Institute of Chemistry for Life and Health Sciences)
New Ru(II) Polypyridyl Complexes Containing Non-Innocent Ligands as Chemotherapeutic Agents
- **Johannes KARGES** (Institute of Chemistry for Life and Health Sciences)
Long-Wavelength Absorbing Ru(II) Polypyridyl Complexes as Photosensitizers for Photodynamic Therapy
- **Islem ISHAK** (Institut Parisien de Chimie Moléculaire)
Stereoselective preparation and reactivity of 4-hydroxy-1-allenylboranes
- **Xuezhao XU** (Institut de Recherche de Chimie Paris)
Preparation of biodegradable polymers by tandem reactions

1

Monday September 16th
Auditorium Herpin, 11h



Sandrine ITHURRIA (ESPCI)

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Control of the composition and the surface chemistry of II-VI semiconductor nanoplatelets

Abstract. 2D colloidal II-VI semiconductor nanoplatelets (NPLs) are a unique class of nanoparticles with optical properties comparable to quantum well. Their thicknesses, the unique confined direction, are defined at the atomic scale all along the nanoparticles without roughness which provide them optical properties without inhomogeneous broadening. In a synthesis all the NPLs present exactly the same number of monolayers. An effort has been dedicated to the growth of cadmium chalcogenides NPLs and their heterostructures. Indeed due to their shapes, these NPL can either be grown parallel to the confined direction leading to core/shell or perpendicular to the confined direction leading to core/crown NPLs. In order to extend the optical properties of the NPLs, cation exchange has been proposed as a strategy to synthesis mercury chalcogenides nanoplatelets. Compare to spherical quantum dots emitting in the same range of wavelength, the HgTe NPLs present a similar PL efficiency (10%) but with a far narrower emission (60meV for an emission at 880nm) and shortest decay rate. In addition of the control of their compositions and quantum confinement, a control of the surface chemistry is another way to control the optical properties. Indeed NPLs can be stabilized by halides that act as X-L-type ligands, costabilized by amines which provide colloidal stability in nonpolar solvents. The hydrogen from the amine can participate in a hydrogen bond with the lone pair electrons of surface halides. In the case of CdSe, the improved surface passivation leads to an increase in the fluorescence quantum efficiency of up to 70% in the case of bromide. This ligand exchange is associated with a decrease in stress that leads to unfolding of the NPLs, which is particularly noticeable for iodide-capped NPLs.

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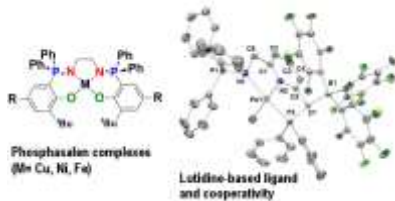
Monday September 23rd
Auditorium Herpin, 11h



Audrey AUFFRANT (Ecole polytechnique)
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Iminophosphorane complexes: non innocence and reactivity

Abstract. Mixed ligands relying on the complementarity on different heteroatoms found numerous applications especially in catalysis. We are particularly interested in ligands incorporating the iminophosphorane (P=N) functionality from which we will present two original families, some of their metal complexes in order to discuss their non-innocence, their reactivity and show some catalytic applications.



3

Monday September 30th
Auditorium Herpin, 11h



Christophe BUCHER (ENS Lyon)
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Electron-Triggered Metamorphism in Self-Assembled Metal-Organic Architectures

Abstract. Stimuli-responsive self-assembled molecular materials are currently subject to intense research activity. This growing interest stems largely from the myriad of exciting applications envisioned for dynamic supramolecular assemblies, also known as dynamers, in materials science, sensing, catalysis and electronics. Enormous technologic interests are for instance at stake in being able to devise molecular objects that could respond to external stimuli by changes in structure and function. These particular properties can lead to applications in various domains as (i) in molecular electronics, (ii) in analytic science, with switchable hosts allowing the controlled binding/release of pollutants or drugs, (iii) in materials science with the development of adaptive supramolecular polymers.

Our own research activity over the past few years has mainly fallen within the scope of molecular metamorphism, a terminology borrowed from geologists that we use to picture the structural responses of molecules to external stimuli. In this lecture, the syntheses and detailed physico-chemical properties of a series of switchable molecular architectures whose movements are triggered by electrochemically driven self-assembly of organic radicals will be presented. Particular emphasis will be given to electron-responsive tweezer-like molecules allowing to control the organization within self-assembled coordination oligomers/polymers. The dynamic properties of these redox-responsive molecular architectures and molecular materials will mainly be discussed on the basis of electrochemical, spectro-electrochemical and ESR experiments supported by quantum chemical calculations.

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October

Monday October 7th
Auditorium Herpin, 11h

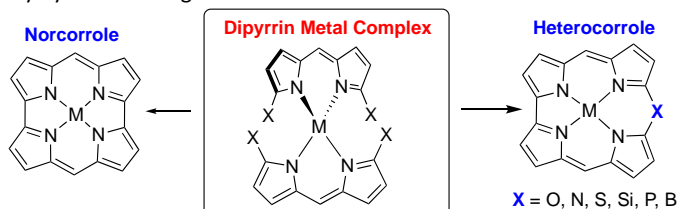


Hiroshi Shinokubo (Nagoya University)

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New heterocorroles and norcorroles from dipyrin metal complexes

Abstract. We have developed a metal-templated strategy to access various novel porphyrinoids. Dipyrin metal complexes are a nice precursor to prepare 10-heterocorroles containing various heteroatoms (O, N, S, Si, P, and B) as well as norcorroles. 10-Heterocorroles exhibit tunable optical and electronic properties depending on the heteroatoms. Norcorroles are a strongly antiaromatic porphyrinoid, which shows various interesting properties such as three-dimensional aromaticity by π - π stacking.



5

Monday October 14th
Auditorium Herpin, 11h



Alexander Kirillov (University of Lisbon, PT)

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Metal-Organic Architectures for Catalysis & Functional Materials

Abstract. This presentation will highlight our recent research on the design and applications of a wide diversity of functional metal-organic architectures, including metal-organic frameworks (MOFs), coordination polymers (CPs), and multinuclear metal complexes. The following topics will be discussed. (1) Aqueous medium self-assembly generation and structural diversity of Cu(II) CPs driven by aminoalcoholate and carboxylate ligands. Application of these compounds as efficient catalysts in mild oxidative C-H functionalization of alkanes and other substrates. (2) Crystal engineering of MOFs & CPs assembled from multifunctional polycarboxylic acids with biphenyl or phenyl-pyridine cores and various metal nodes (Fe, Co, Cu, Mn, Ni, Zn, Cd, Ln). Examples of their applications as heterogeneous catalysts, selective sensors, adsorbents, or luminescent probes. (3) Design of bioactive Ag, Cu, and Zn-based metal-organic architectures toward applications as topical antimicrobial agents.

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Monday October 21st
Auditorium Herpin 11h



Frank Glorius (Westfälische Wilhelms-Universität Münster, Germany)

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On discovery in catalysis

Abstract. Catalysis is a key technology of our modern societies, since it allows for increased levels of selectivity and efficacy of chemical transformations. While significant progress can be made by rational design or engineered step-by-step improvements, many pressing challenges in the field require the discovery of new and formerly unexpected results (**Figure 1**). Arguably, the question “How to discover?” is at the heart of the scientific process. In this talk, strategies and discoveries from the Glorius group will be discussed. Topics will include the use of N-heterocyclic carbenes (NHCs)¹ in different fields of catalysis (such as arene hydrogenation² and on-surface chemistry³) and also discovery and reproducibility in photocatalysis.⁴⁻⁶



Figure 1: “Landing of Columbus at the Island of Guanahani, West Indies, 12 October 1492”, John Vanderlyn, 1836-47

Acknowledgements: We thank the Deutsche Forschungsgemeinschaft, the European Research Council and the Alexander von Humboldt Foundation for generous financial support.

References: 1. M. N. Hopkinson, C. Richter, M. Schedler, F. Glorius, *Nature* **2014**, *510*, 485. 2. M. P. Wiesenfeldt, Z. Nairoukh, W. Li, F. Glorius, *Science* **2017**, *357*, 908. Z. Nairoukh, M. Wollenburg, C. Schlepphorst, K. Bergander, F. Glorius, *Nat. Chem.* **2019**, *11*, 264. 3. J. B. Ernst, C. Schwermann, G.-I. Yokota, M. Tada, S. Muratsugu, N. L. Doltsinis, F. Glorius, *J. Am. Chem. Soc.* **2017**, *139*, 9144. A. Bakker, A. Timmer, E. Kolodzeiski, M. Freitag, H. Y. Gao, H. Mönig, S. Amirjalayer, F. Glorius, H. Fuchs, *J. Am. Chem. Soc.* **2018**, *140*, 11889. 4. a) M. N. Hopkinson, A. Gomez-Suarez, M. Teders, B. Sahoo, F. Glorius, *Angew. Chem. Int. Ed.* **2016**, *55*, 4361. b) F. Strieth-Kalthoff, C. Henkel, M. Teders, A. Kahnt, W. Knolle, A. Gómez-Suárez, K. Dirian, W. Alex, K. Bergander, C. G. Daniliuc, B. Abel, D. M. Guldí, F. Glorius, *Chem* **2019**, doi:10.1016/j.chempr.2019.06.004. 5. M. Teders, C. Henkel, L. Anhäuser, F. Strieth-Kalthoff, A. Gómez-Suárez, R. Kleinmans, A. Kahnt, A. Rentmeister, D. M. Guldí, F. Glorius, *Nat. Chem.* **2018**, *10*, 981. 6. L. Pitzer, F. Schäfers, F. Glorius, *Angew. Chem. Int. Ed.* **2019**, *58*, 8572.

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Monday October 28th
Tower 32-42, 1st floor
Room 101, 11h

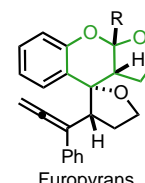
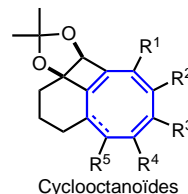
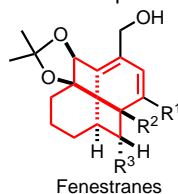


Gaëlle Blond (Université de Strasbourg)

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Synthesis of Complex Molecules via Metal-Mediated Domino Reactions

Abstract. The design and elaboration of complex molecules from simple starting material in the minimum of operations is a challenging goal in organic synthesis. While most reactions allow for the formation of only one bond at a time, a particularly promising strategy to access complex molecules is to trigger domino reactions that convert simple starting materials into highly sophisticated targets by creating several bonds in a one-pot operation. Towards this end, the use of transition metal-catalyzed processes has become a powerful tool. In this context, we have started a research program intended to develop new metal-mediated domino reactions leading to original polycycles and our recent results will be presented.



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November

Monday November 4th
Auditorium Herpin 11h



9

Pascal GERBAUX (University of Mons, Belgium)

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Probing the 3D structures of organic (macro/supra)molecules by ion mobility experiments : from fundamentals to analysis.

Abstract. Structural analysis is undoubtedly one of the most important aspects of current research. The vertiginous development of spectroscopic techniques over the last decades has allowed the scientific community to accumulate a great deal of success, by affording relevant data at the molecular level. As a striking example, mass spectrometry is in perpetual development. The recent combination of ion mobility spectroscopy with mass spectrometry has allowed to go one step further in structural analysis, by providing information on the spatial structure of gaseous ions. In this seminar, after a brief description of the theoretical bases, various remarkable examples will be presented to demonstrate the pros and cons of the IMS-MS association.

Tuesday November 12th
Tower 32-42, 1st floor
Room 101, 11h



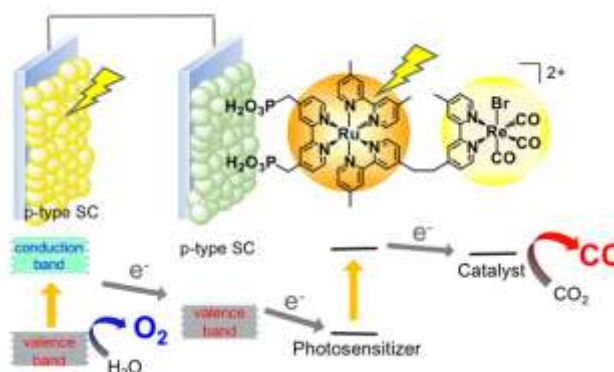
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Osamu ISHITANI (Tokyo Institute of Technology)

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New Directions to Development of Photocatalytic CO₂ Reduction

Abstract. Both the problems of the global warming and shortage of the fossil resources have brought us great interests in photochemical utilization of CO₂ with solar energy. Efficient photocatalysts for CO₂ reduction must be necessary for development of such an important technology. We have developed novel types of photocatalysts using metal complexes as key players in not only homogeneous solutions but also in heterogeneous systems including semiconductor photocatalysts. In this presentation, I will mainly discuss about two recent topics; (1) photocatalytic CO₂ reduction using water as a reductant (Scheme) and (2) CO₂ reduction photocatalytic systems consisting of only earth-abundant elements.



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Monday November 18th
Auditorium Herpin 11h



Hiroko YAMADA (Nara Institute of Science and Technology, Ikoma)

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Chemistry of ethynylene-bridged porphyrinoids: Triphyrin (2.1.1), Porphycene, Porphyrin (2.1.2.1) and further expanded families

Abstract. Porphyrin is one of the representative aromatic compounds and has a planar molecular structure with four pyrrole units connected by four *meso*-carbons. We have focused on a dipyrrolylene unit, where two pyrrole units are connected by ethene bridge. By the presence of ethynylene-bridge, porphyrinoids have different properties from traditional porphyrins due to their flexibility, possible *cis-trans* isomerization, coordination ability of double bonds, and etc. We have studied synthesis, structure and properties of various ethynylene-bridged porphyrin families. This presentation will introduce the chemistry of triphyrin (2.1.1)¹, porphycene², porphyrin(2.1.2.1)³ and hexaphyrin(2.1.2.1.2.1)⁴.

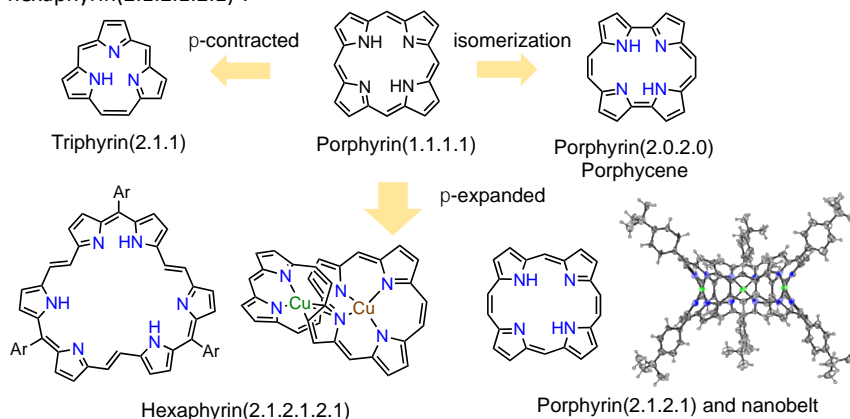


Figure. Porphyrin families including dipyrrolylene bridges.

1. a) Z.-L. Xue, Z. Shen*, J. Mack, D. Kuzuhara, H. Yamada*, T. Okujima, N. Ono, X.-Z. You*, N. Kobayashi*, *J. Am. Chem. Soc.*, **2008**, *130*, 16478-16479; b) D. Kuzuhara, H. Yamada*, Z. Xue, T. Okujima, S. Mori, Z. Shen, H. Uno, *Chem. Commun.*, **2011**, *47*, 722-724; c) D. Kuzuhara, Y. Sakakibara, S. Mori, T. Okujima, H. Uno, H. Yamada*, *Angew. Chem. Inter. Ed.*, **2013**, *52*, 3360-3363
2. D. Kuzuhara, H. Yamada*, K. Yano, T. Okujima, S. Mori, H. Uno, *Chem. Eur. J.*, **2011**, *17*, 3376-3383.
3. a) D. Kuzuhara*, W. Furukawa, A. Kitashiro, N. Aratani, H. Yamada*, *Chem. Eur. J.* **2016**, *22*, 10671-10678. b) S. Xue, D. Kuzuhara*, N. Aratawni, H. Yamada*, *Org. Lett.* **2019**, *21*, 2069-2072.
4. S. Xue, D. Kuzuhara*, N. Aratani, H. Yamada*, *Inorg. Chem.* **2018**, *57*, 9902-9906.

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Monday November 25th
Auditorium Herpin 11h

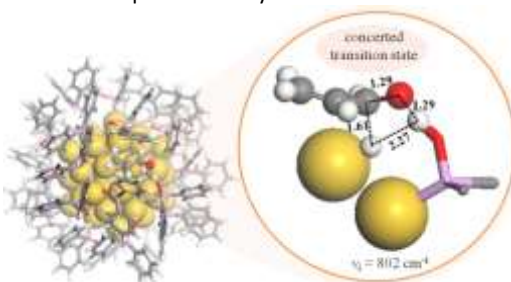


Piet VAN LEEUWEN (INSA-Toulouse)

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Secondary Phosphine Oxides as bifunctional ligands in catalysis

Abstract. In 1986 we introduced platinum complexes of diphenylphosphine oxide (SPO) as homogeneous catalysts for hydrogenation and hydroformylation reactions. As a phosphorus ligand it is very akin to triphenylphosphine, the workhorse ligand at the time in homogeneous catalysis. We speculated that the oxygen atom might play an additional role and facilitate heterolytic cleavage of dihydrogen. Since then numerous applications of SPOs in catalysis have been reported and in several occasions the ligands play a special role. In recent years we have used SPOs as ligands in metal nanoparticle catalysts and DFT calculations support the bifunctional role.



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December

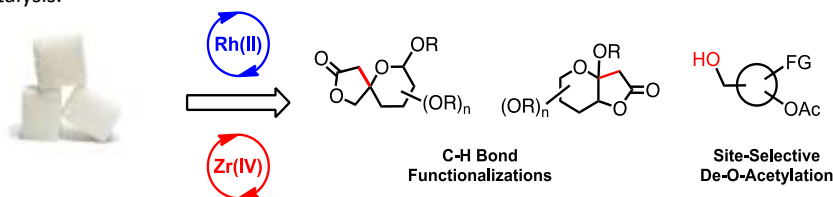
Monday December 2nd
Auditorium Herpin 11h



Thomas LECOURT (Laboratoire COBRA - INSA de Rouen Normandie)
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Transition Metal Catalysis : A Sweet Perspective

Abstract. Selective modification of complex sugars is a major challenge to design innovative chemical tools for glycobiology. In this context, our team has been involved for several years in the use of transition-metal catalysis to get a straightforward access to highly elaborated carbohydrate scaffolds. We more particularly developed a tool-box to prepare sugars with a quaternary position that relies on the selective functionalization of C-H bonds by 1,5 insertion of a metal-carbene. We also more recently reported a new method for site-selective deprotection of peracetylated molecules with a high tolerance towards functional groups. Developing these transformations on substrates with a finely tuned reactivity like sugars furthermore gave new insights on the mechanism of these reactions that should pave the way to new developments in the field of transition-metal catalysis.



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Monday December 9th
Auditorium Herpin 11h



Ewen BODIO (ICMUB - Université Bourgogne-Franche-Comté)
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From classic BODIPY to multifunctional Wazaby platform

Abstract. BODIPY is one of the most versatile fluorophore (high quantum yield, high brightness, stable, synthesizable at gram-scale...), but its emission in the visible region of light spectrum and its poor water-solubility hamper its use for *in vivo* applications. This lecture will describe how the optimization a BODIPY-based theranostic led to the design of a multifunctional platform suitable for *in vivo* optical imaging.

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Monday December 16th
Auditorium Herpin 11h

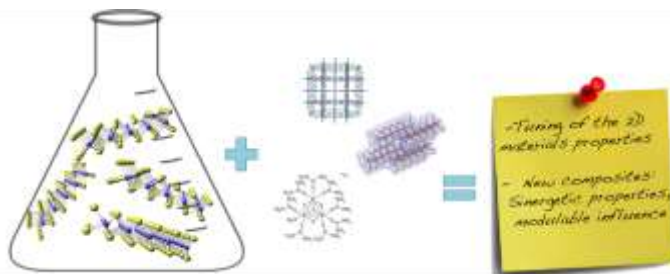


Alicia FORMENT-ALIAGA (ICMol -Universitat de València)

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Tunable mixed-dimensional heterostructures by the chemical functionalization of 2D materials

Abstract. Since the isolation of graphene in 2004, there has been an explosion in the search for other 2 dimensional (2D) materials. Among them, special attention has been paid to transition metal chalcogenides (TMCs) due to their broad spectrum of opto-electronic properties. One step forward the preparation of hybrid composites based on molecular materials and TMCs represents a real advance for the applicability of these 2D materials with a broadening of their functionalities. In this scenario, our work focuses on the covalent/electrostatic functionalization of TMCs with molecular systems targeting smart and multifunctional heterostructures.



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January

Monday January 6th
Tower 32-42, 1st floor
Room 101, 11h



4

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Reaxys, a searching database that helps you daily in your research and lab work !

Abstract. Every scientist needs to optimize his/her time. Finding relevant references in the literature, sorting out the results, getting answers to precise questions in an ergonomic way, while being complete and exhaustive, is an everyday-challenge. Reaxys is a search and excerpt database in chemistry (organic, inorganic, materials, medicinal etc). Physico-chemical properties, spectra, reactions and preparations, actions on biological targets, synthesis routes (exact or by similarity, but not predictive) are excerpted and indexed manually to be presented in a 'digestible' way in a simple and efficient interface. Many universities (Strasbourg, Marseille, Rennes, Nice, Amiens,..) though already using SciFinder, were curious and tested Reaxys in 2019 and found functionalities that made their searches easier in their daily research work. A free month of access is offered in 2019 if you also want to test Reaxys on your own projects. You'll know more by the end of the presentation !

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Monday January 13th
Auditorium Durand, 11h



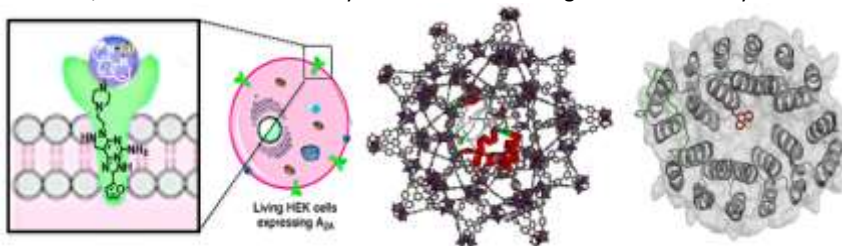
Jean-Pierre MAHY (Paris-Saclay University)

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From antibodies to MOFs: a full set of envelopes for metal cofactors in order to build up new artificial metalloenzymes

Abstract. Our group has long been involved in the production of artificial Metalloenzymes that have been found able to catalyze stereo-selective oxidation of chemicals by H₂O₂, RNase like hydrolysis of oligonucleotides and stereoselective Diels-Alder reactions. The most recent developments of our research will be presented here:

- The design of new artificial metalloenzymes that catalyze the stereoselective Diels-Alder reaction "in vivo". The use of such biocatalysts for theranostic purposes will be introduced.
- The elaboration of totally artificial metalloenzymes by:
 - (i) insertion of metal complexes into a new family of artificial proteins based on a thermostable alpha-helical repeated motif (α Rep),
 - (ii) insertion of a minienzyme, microperoxidase, into Metal Organic Frameworks (MOF),
 - (iii) association of polyoxometallates (POMs) with artificial polyimine polymer-based reductases, to afford ArMs that catalyze the oxidation of organic substrates by O₂ in water.



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Monday January 20th | NO SEMINAR

Monday January 27th
Auditorium Astier, 11h

Stéphane BAUDRON (CNRS-Université de Strasbourg UMR 7140)

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Dipyrrin-based self-assembled architectures



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Abstract. Dipyrrins are bis-pyrrolic derivatives that can be rather easily synthesized and functionalized, forming monoanionic chelates under mild basic conditions. These features make them interesting ligands for the elaboration of discrete and infinite metal-organic architectures. In particular, our efforts have centered on the preparation of polynuclear helicates and Metal-Organic Frameworks using hydrogen or coordination bonding as well as Ag- π interactions. The construction strategies, the structural characteristics and the physical properties of these self-assembled systems will be presented.

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February

Monday February 3rd
Auditorium Astier, 11h



Florence MAHUTEAU-BETZER (Institut Curie, Orsay)

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From a screening of the Curie-CNRS Chemical Library to a drug in clinical phase for ulcerative colitis & From DNA fluorescent probes to fluorescent biosensor for protein-protein interaction

Abstract. In the first part, a success story of the screening of the Curie-CNRS chemical library will be described. This led to the discovery of alternative splicing inhibitors, one of them is currently in phase 2b for ulcerative colitis.

In the second part, we will focus on the development of fluorescent biosensors for the detection of protein-protein interaction.



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Monday February 10th
Auditorium Astier, 11h

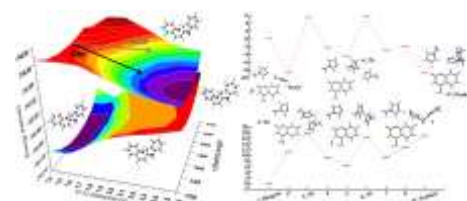


Ilenia CIOFINI (CNRS/Chimie-ParisTech)

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Disclosing reactions mechanisms: what can we learn from theoretical approaches?

Abstract. The development of computationally affordable yet accurate methods for the description of ground and excited state reactivity of molecular species in solution and more complex environments, made in-silico modelling a powerful, and complementary approach to experimental studies, to disclose reactions mechanisms. In this lecture, through recent selected examples of application, the strengths and shadows of currently used theoretical approaches will be illustrated focusing on methods rooted on Density Functional Theory.



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Monday February 17th
Auditorium Astier, 11h

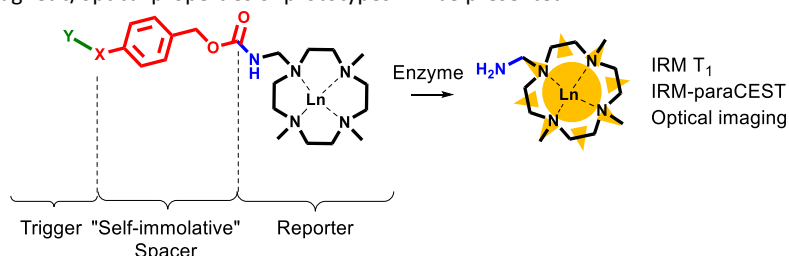


Philippe DURAND (Institut de Chimie des Substances Naturelles
(ICSN), Gif-sur-Yvette (UPR 2301))

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**Activatable Lanthanide complexes: Probes for multimodal imaging
of an enzyme activity**

Abstract. While enzyme activity is routinely determined using *in vitro* assays, its *in vivo* visualization remains a challenge. This is a subject of increasing interest in molecular imaging since dysregulation of these biological catalysts is associated with many diseases. In this context, we designed lanthanide-based probes that are responsive to a specific enzyme activity (β -galactosidase for instance). These probes can be monitored by one to three different modalities depending on the lanthanide used: T₁-MRI, paraCEST-MRI and optical imaging. The design, synthesis and magnetic/optical properties of prototypes will be presented.



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Monday February 24th
Auditorium Astier, 11h



Claire FAVE (LEM UR 7591, Université de Paris)

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**Anion detection through control and activation of halogen
bonding triggering by electrochemistry**

Abstract. Non-covalent interactions are crucial and of increasing interest in "supramolecular electrochemistry" concerning redox properties of supramolecular assemblies in solution. The importance of halogen bonding, an only recently described non-covalent interaction, is nowadays fully recognized. In this context we have shown the electrochemically triggered switching of halogen bonding in solution and at the electrode/electrolyte interface. The observed high sensitivity for chloride detection is a promising finding considering fundamental understanding of reactivity issues as well as potential applications of the concept for the future development of novel selective anion sensors, capture/release systems and organocatalysis.

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March



Christian P. R. HACKENBERGER (Humboldt University of Berlin)
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The power of chemoselectivity: functional protein-conjugates for intra- and extracellular targeting

Abstract. Our lab aims to identify new bioorthogonal reactions for the synthesis and modification of functional peptides and proteins. We apply these highly selective organic reactions¹ to study functional consequences of naturally occurring posttranslational protein modifications (PTMs), in particular phosphorylated Lys- and Cystein-peptides,² as well as to generate novel peptide- and protein-conjugates for pharmaceutical and medicinal applications. In this presentation I will focus on the **chemical modification of functional proteins** as well as their **cellular delivery**. Thereby, we employ cyclic cell penetrating peptides (cCPPs) to transport a functional full length protein to specific intracellular compartments of living cells as recently demonstrated by the direct delivery of different fluorescent proteins.³ For protein modification we use a combined approach of intein expression as well as recently developed chemoselective reactions and enzymatic ligations, for instance the so-called P5⁴ or Tub-tag labeling.⁵ This concept is finally applied to generate new **antibody-drug conjugates**^{4b} as well as **cell-permeable nanobodies**, i.e. small antigen binding proteins that remain active within the reductive milieu inside living cells, to interfere with intracellular targets.⁶

1) *Curr. Opin. Chem. Biol.* **2014**, 22, 62. 2)a) *J. Am Chem. Soc.* **2014**, 136, 13622; b) *Nature Comm.* **2016**, 7,12703. 3)a) *Angew. Chem. Int. Ed.* **2015**, 54, 1950; b) *Bioconjugate Chem.* **2019**,30,400.4)a) *Angew. Chem. Int. Ed.* **2019**, 58, 11625; b) *Angew. Chem. Int. Ed.* **2019**, 58, 11631; c) *Chem Sci.* **2019**, 10, 6322. 5)a) *Angew. Chem. Int. Ed.* **2015**, 54, 13787, b) *Chem. Sci.* **2017**, 8, 3471. 6) *Nature Chem.* **2017**, 9, 762.

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Monday March 9th
 Auditorium Astier, 11h



Ewen BODIO (ICMUB - Université Bourgogne-Franche-Comté)
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From classic BODIPY to multifunctional Wazaby platform

Abstract. BODIPY is one of the most versatile fluorophore (high quantum yield, high brightness, stable, synthesizable at gram-scale...), but its emission in the visible region of light spectrum and its poor water-solubility hamper its use for *in vivo* applications. This lecture will describe how the optimization a BODIPY-based theranostic led to the design of a multifunctional platform suitable for *in vivo* optical imaging.

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Monday March 16th
Auditorium Astier, 11h



Grégory NOCTON (Ecole Polytechnique)

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Organometallic chemistry of low-valent lanthanides: unusual oxidation states and magnetic sandwiches

Abstract. Organolanthanide complexes are an interesting class of organometallic compounds that have been developed in the 1950's and that now concern most of the rare earths in their trivalent and divalent states. The applications for such compounds are numerous for single electron transfer reactivity and also because of their optical and magnetic properties: their Single-Molecule-Magnet behavior have impressed with record blocking temperatures. We will present a short overview of our methodology for the synthesis of organometallic complexes with very original geometry and in which the oxidation state is not trivial to assess because of the development of multiconfigurational electronic states.

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Monday March 23rd
Auditorium Astier, 11h



Alain PARIS (Muséum national d'Histoire naturelle, UMR 7245 - MCAM)

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L'analyse des données en métabolomique : un passage obligé

Abstract. Dans le champ de la chimie analytique, l'amélioration continue réalisée sur les deux dernières décennies des performances intrinsèques de détection des molécules, que ce soit par spectrométrie de masse ou par résonance magnétique nucléaire (RMN), a renouvelé la manière de caractériser le fonctionnement métabolique des organismes vivants. Cependant, un renouvellement en profondeur de l'analyse multivariée des données a été nécessaire. De nouvelles méthodes dénommées OSC-SDA, ICDA ou PHATE sont apparues ; elles sont très éloignées de l'analyse en composantes principales (PCA). Leur efficacité sera illustrée à partir d'exemples pris dans l'analyse métabolomique par RMN des perturbations endocriniennes enregistrées dans une cohorte de sportifs ou dans l'étude du métabolome obtenue par imagerie par spectrométrie de masse sur coupe de larves de coraux en métamorphose.

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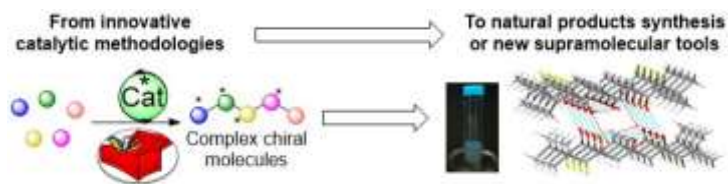
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Monday March 30th
 Auditorium Astier, 11h



Adrien QUINTARD (Aix-Marseille University - CNRS)
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(Multi)-catalytic strategies, synthetic economies... and some supramolecular applications

Abstract. The presentation will highlight our recent success in the development of multi-catalytic transformations. Based on the combinations between inexpensive iron or copper complexes with organocatalysts, they enable the rapid preparation of a broad range of molecules of interest. This was demonstrated in the context of natural products synthesis but also recently in the elaboration of new type of supramolecular tools.



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