

Chairs@E2S UPPA

March 2020



Eight years ago, UPPA launched a distinctive initiative with the creation of research and education chairs. Several aims were pursued:

- to invest into significant scientific projects in accordance with the strategy of the university
- to create a task force dedicated to these specific research objectives
- to tighten the relationships with private and public partners, placing them within a five-years horizon instead of the traditional three-years partnership format
- to provide an increased visibility, thereby promoting the outreach of upcoming results and strengthening our international network.

Over the 2011-2017 period, five senior chairs have been created, sponsored by private partners and local authorities, in the fields of engineering, management and cultural policy.

With E2S UPPA, this framework has been significantly expanded. New chair formats have been launched, in addition to the existing format directed at established researchers: junior chairs for young promising researchers and part time international chairs hosting researchers with a very high international visibility have been created. The objective is to drastically increase the scientific power of E2S UPPA and, at the same time, to embed – at the very starting point of the chair – research and education as the scientific team build up around a chair should also have educational responsibilities within the flagship programmes of E2S UPPA.

This leaflet gathers the chairs that are active as of the end of 2019. In addition to the five already existing ones, E2S UPPA created six junior chairs, seven senior chairs and six international chairs. Sixteen new faculty members have been hired.

Over 70 doctoral fellowship and more than 100 one-year post-doctoral fellowships have been, or will be, offered in the coming years within these chairs, covering a wide variety of scientific topics in line with the ambitions and missions of E2S UPPA.

This unprecedented effort was made possible due to a wide participation of private and public partners. Their decisive input is acknowledged in the description of each specific chair.

Each project results from the convergence between scientific issues, stakeholders' needs and above all the interest in the mutualisation of concerns and efforts. Our experience shows that it has been beneficial to everyone.

The Energy Environment Solutions (E2S) I-SITE project gathers a consortium composed of the Université de Pau et des Pays de l'Adour (UPPA), a multidisciplinary university, two national research organisations, INRAE (French National Institute for Agricultural Research) and Inria (French national research institute for the digital sciences), and recently the CNRS (French National Centre for Scientific Research). **This partnership is referred to as « Academic and Institutional Consortium » in this document.**

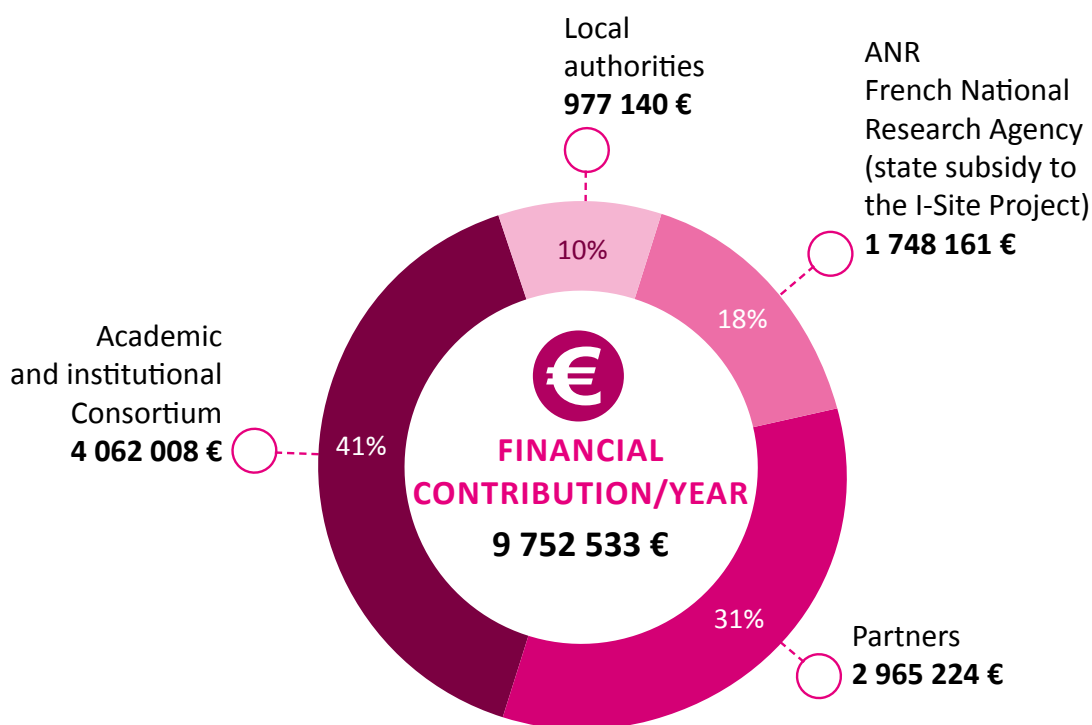
24 Chairs

- 4** Academic Junior Chair
- 2** Junior Chair with partnerships
- 12** Senior Chair with partnerships
- 4** International Academic Guest Chair
- 2** International Guest Chair with partnerships



TEAMS

- Permanent employees : **66**
- PhD : **74**
- Post doctorate : **119**



DISCIPLINES (ERC Panels)

PHYSICAL SCIENCES AND ENGINEERING

PE1	1 chair	Mathematical foundations
PE4	3 chairs	Physical and analytical chemical sciences
PE5	5 chair	Materials and synthesis
PE6	1 chair	Computer science and informatics
PE7	1 chair	Systems and communication engineering
PE8	3 chairs	Products and processes engineering
PE8 / PE10	3 chairs	Products and processes engineering / Earth system science
PE8 / PE3 / PE10	1 chair	Products and processes engineering / Condensed matter physics / Earth system science

SOCIAL SCIENCES AND HUMANITIES

SH2	4 chairs	Institutions, values and beliefs and behaviour
SH5 / SH6	1 chair	Cultures and cultural production / The study of the human past

LIFE SCIENCES

LS3	1 chair	Cellular and Developmental Biology
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Summary

Academic Junior Chair

◊ Amino acid metabolism in rainbow trout	Florian Beaumatin	P. 10-11
◊ Atomistic and multi-scale simulations of coupled transport of confined fluids in nanoporous media	Amaël Obliger	P. 12-13
◊ DiStuRB - STructural DIagenesis of caRBonates	Nicolas Beaudouin	P. 14-15
◊ PolSSol - Dynamics of subsurface politicisation for energy transition	Sebastien Chailleux	P. 16-17

Junior Chair with partnerships

◊ AWESOME - mAnufacturing of neW gEneration Sustainable and therMoplastic coMpositEs	Anaïs Barasinski	P. 20
◊ BOIS - Biobased materials	Eduardo Robles	P. 21

Senior Chair with partnerships

◊ Architecture and urban physics	Benoît Beckers	P. 25
◊ CO2ES - CO ₂ Enhanced Storage	Fabrizio Croccolo	P. 26-27
◊ ECOTOX - Ecotoxicology of chemical contaminants in inland waters in the context of global change	Séverine Le Faucheur	P. 28
◊ HCP - History, Cultures and Heritage	Laurent Jalabert	P. 29
◊ HPC-Waves - High Performance Computing of Waves	Volker Roeber	P. 30-31
◊ IMAGES - X-ray imaging	Peter Moonen	P. 32-33
◊ MANTA - Marine Materials Development of bio-inspired and sustainable (bio) materials to lower the marine environmental impact	Susana Fernandes	P. 34-35
◊ MOVE - Mobility evolution towards sustainable	Louis de fontenelle	P. 36
◊ DESDM - Distributed Energy System Data Management	Richard Chbeir	P. 37
◊ GEOLOGY I et II - Quantitative Structural Geology	Jean-Paul Callot	P. 38-39
◊ TEEN - Territories in energy and environmental transitions	Xavier Arnauld de Sartre	P. 40-41
◊ OPTIMA - Observatory of LocAl PiloTage and Managerial Innovation	David Carassus	P. 42

International Academic Guest Chair

◊ Accelerated Development of Alloy Materials for Energy Technologies	Andrew Gellman	P. 45
◊ Developing New Energy Conversion Platforms using Boron-Nitrogen Heterocycles	Shih-Yuan Liu	P. 46-47
◊ Mathematics and statistics	Kerrie Mengersen	P. 48-49
◊ InterMat - Interface Matters in Solution Processed Inorganic/Organic Thin Film Solar Cells for Bio-inspired Solar Fuels Generation	Emilio Palomares	P. 50


International Guest Chair with partnership

◊ PULPA - Pulsed Power Science Technology and Applications	Bucur Novac	P. 52-53
◊ Untargeted Molecular-level Analysis of Complex Systems: An opportunity to learn from sample complexity	Ryan Rodgers	P. 54



Academic Junior Chair

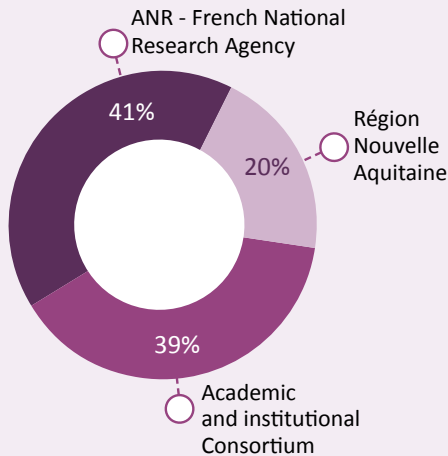
Junior chairs are directed towards young promising researchers, typically with a research experience of 1-4 years after their Ph.D. The call for applicants is opened and widely publicised internationally. Recipients are offered a five-years tenure track position and a starting package with a doctoral fellowship, five one-year post-doctoral fellowships and support for direct costs. Chair holders are expected to reach a level allowing them to successfully apply to ERC starting grant.





Amino acid metabolism in rainbow trout

€ FINANCIAL CONTRIBUTION/YEAR



🏰 KEY DATES

- Chair kick-off: April 2018
- Duration: 5 years

👥 TEAM COMPOSITION

- Permanent employees: 2
- PhD: 1
- Post doctorate: 5

📍 LOCALISATION: Saint Pée sur Nivelle

- Joint research unit UPPA/INRAE - Nutrition, metabolism and aquaculture (MIRA - NuMÉA)

@ LEADER

- florian.beaumat@inrae.fr

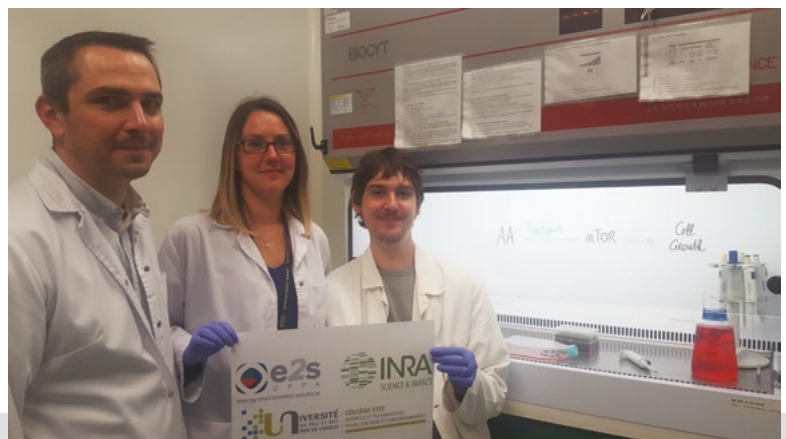


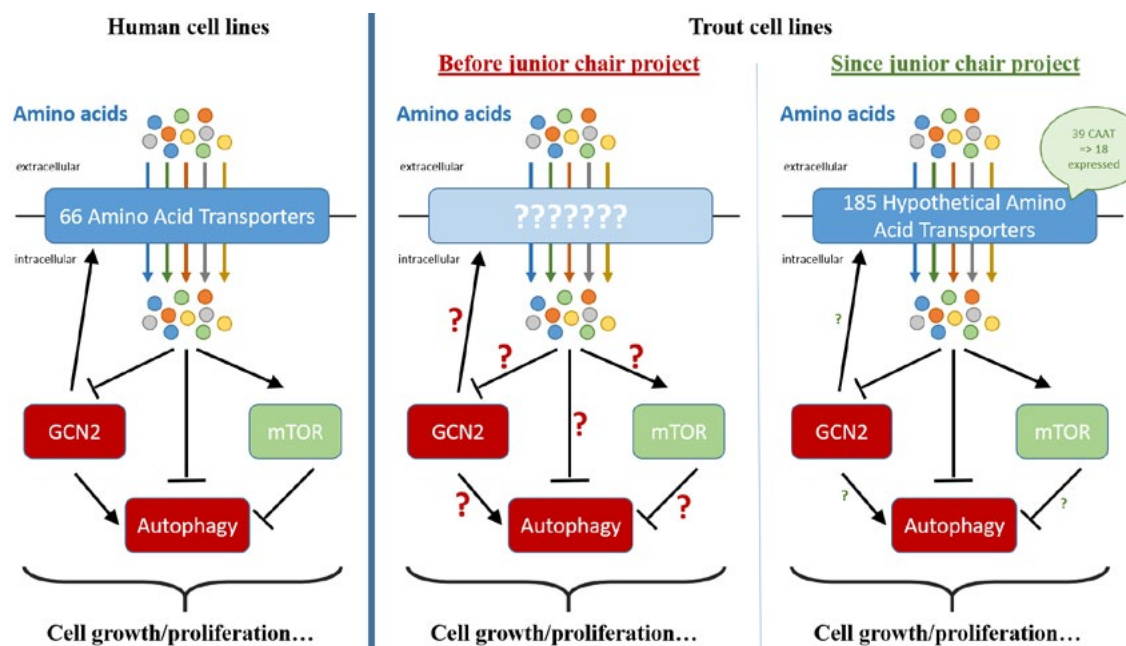
Florian BEAUMATIN

During my thesis, I studied autophagy, a cell survival process stimulated by starvation. During my post-doctoral contract I studied how cells detect the presence of nutrients through the activation of a key enzyme called mTOR, also known to regulate autophagy.

🔍 PRESENTATION

The expansion of aquaculture, in combination with limited availability and high prices of fishmeal, has prompted feed producers to include more plant proteins in the aquaculture feeds. However, replacement of fishmeal with plant proteins is often limited by the level of some amino acids (AA) in the alternative plant protein sources. While supplementation of agricultural crop sources with synthetic AA have been shown to optimize the nutritional value of those diets, this strategy only allows a partial rescue of fish growth. Based on previous results, we hypothesize that 1) supplemented AA are not efficiently absorbed by fish and 2) the regulators of a key protein complex, called mTORC1, show differences, compared to mammals, that could affect its activation by AA. Therefore, through the study of AA transporters and mTOR regulators in trout, this pioneer project aims to elucidate the molecular mechanisms responsible for this growth retardation as well as to formulate new diets that suit trout growth and the use of plant-based diets.

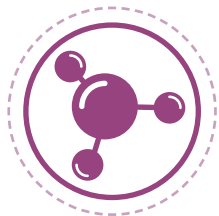




ACHIEVEMENT(S)

Cell lines have long been used in research to determine the molecular mechanisms regulated by amino acids (AA). Thus, in humans, more than 66 AA transporters (AAT) have been identified and studied, in particular for their ability to regulate catabolic (GCN2, Autophagy...) and anabolic (mTOR...) pathways related to cell growth and proliferation. Surprisingly, despite their availabilities, trout cell lines have never been used to answer nutritional questions in the field of aquaculture. Since the beginning of this Chair, we identified 185 genes encoding AAT genes in trout genome that we began to study for their expressions and regulations, with a particular focus on cationic AAT. In addition, our studies allowed us to highlight the AA regulation of the GCN2, autophagy and mTOR pathways in rainbow trout cell lines. So far, our results not only validate the use of trout cell lines as a model for studying AA metabolic pathways, but they also open up a new molecular and cellular research theme to address issues specifically related to trout nutrition in aquaculture.

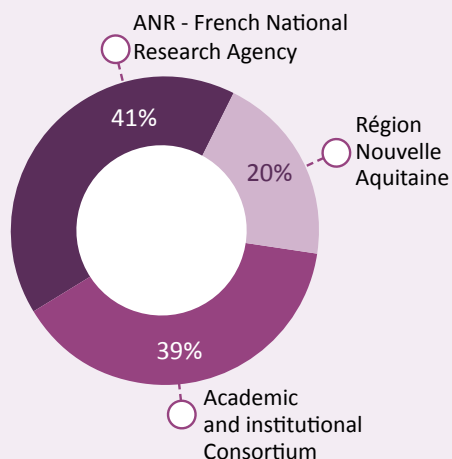
Results obtained so far allowed us to receive the financial supports from INRA, from the European programme H2020, from the Evonik company (for the MeTeOR project) and, very recently, from the ANR, through the "JCJC grant".



Atomistic and multi-scale simulations of coupled transport of confined fluids in nanoporous media



€ FINANCIAL CONTRIBUTION/YEAR



📅 KEY DATES

- Chair kick-off: January 2019
- Duration: 5 years

👥 TEAM COMPOSITION

- Permanent employees: 2
- PhD: 1
- Post doctorate: 5

📍 LOCALISATION: Pau

- Joint research unit UPPA/TOTAL/CNRS - Laboratory for complex fluids and their reservoirs (IPRA - LFCR)

@ LEADER

- amael.obliger@univ-pau.fr



**Amaël
OBLIGER**

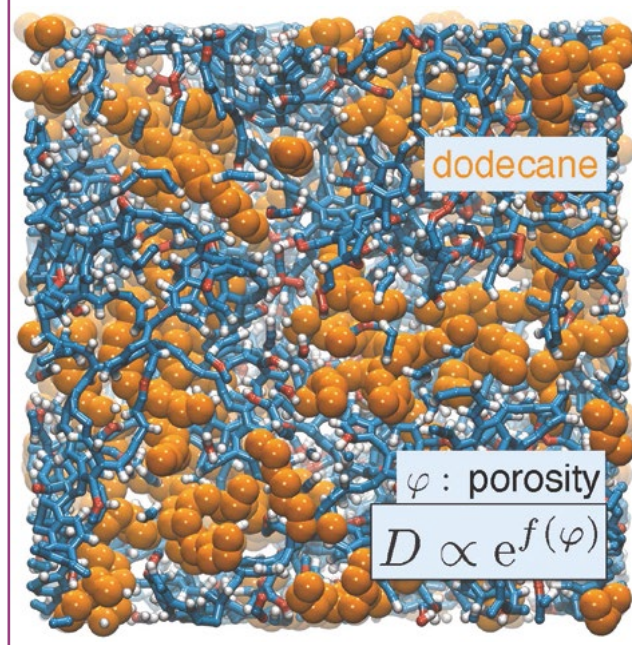
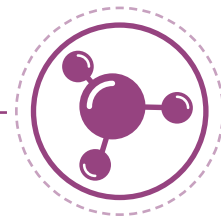
2014, PhD at Université Pierre et Marie Curie. Electrokinetic transport in charged porous media.

2014-2017, postdoc at MIT. Transport properties of source rocks' organic matter.

2017-2018, postdoc at UC, Berkeley. Ionic diffusion and charge carriers dynamics in semiconducting perovskites.

🔍 PRESENTATION

My research project aims at providing fundamental insights and practical bottom-up simulation strategies for the transport processes of confined fluids (CO₂, hydrocarbon mixtures, contaminants) in porous materials that are of great interest for numerous applications involving geo-resources exploitation or artificial membranes (microporous carbons, gas hydrates, cement). Recently, solutions for energy and environment (CO₂ sequestration, enhanced oil recovery, radioactive waste management) increasingly involves extremely confined fluids. In such cases where solid-fluid interactions prevail, I propose to use and develop molecular simulations to elucidate transport and adsorption properties as well as their links with the mechanical and structural properties of the solids, and to upscale them at the engineering scales with lattice based methods.



ACHIEVEMENT(S)

Within this year, we published an article showing the importance of flexibility effects (adsorption induced swelling) of the amorphous microporous matrix on transport and adsorption of fluid (methane) in the microporous phase of kerogen (shales' organic matter).



BIBLIOGRAPHY

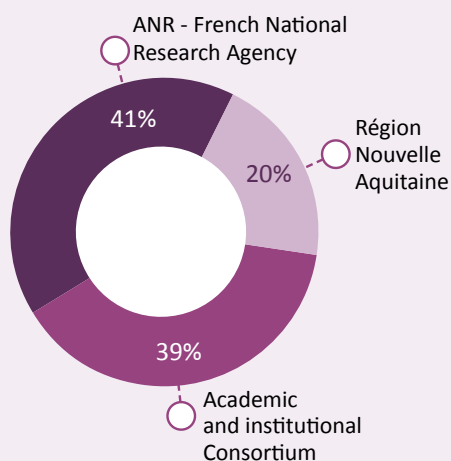
- **Methane diffusion in a flexible kerogen matrix** - *The Journal of Physical Chemistry B* - 123(26):5635–5640, 2019 - BA. Obliger, P-L. Valdenaire, F-J. Ulm, R. Pellenq and J-M. Leyssale



DiStuRB - STructural DIagenesis of caRBonates



FINANCIAL CONTRIBUTION/YEAR



KEY DATES

- Chair kick-off: April 2018
- Duration: 5 years



TEAM COMPOSITION

- Permanent employees: 4
- PhD: 1
- Post doctorate: 5



LOCALISATION: Pau

- Joint research unit UPPA/TOTAL/CNRS - Laboratory for complex fluids and their reservoirs (IPRA - LFCR)



LEADER

- nicolas.beaudouin@univ-pau.fr



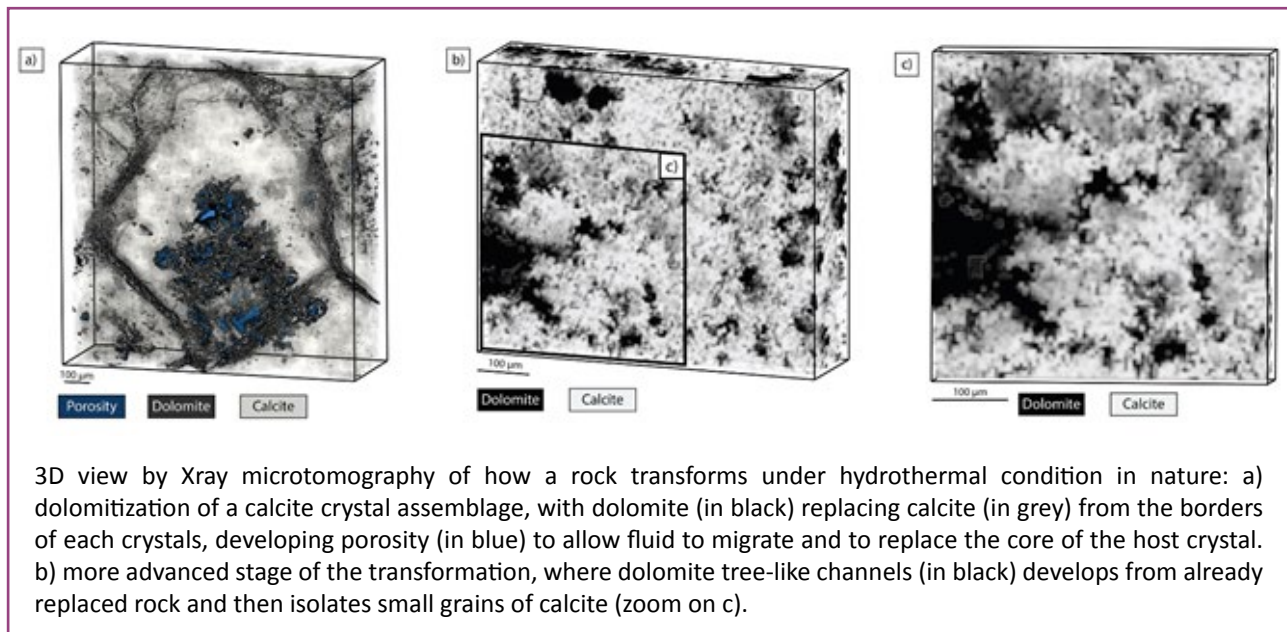
Nicolas BEAUDOIN

I am a geologist specialized in brittle deformation and fluid-rock interactions in sedimentary rocks. Following on a PhD (Université Paris VI), I joined the University of Glasgow over a 5-years period, at first in the EU project FlowTrans, then in a national project.



PRESENTATION

Energy transition from fossil resources to clean ones requires to optimize existing resources, and to enhance the process of storage and cycling. Such progress involves a better understanding of how reservoir rock evolves. This chair revolves around developing quantitative tools for processes that impact petrophysical and chemical properties of carbonates during or after it deforms. By confronting laboratory experiments to natural cases observation, we study the patterns that appear to be linked to carbonate transformation, whether chemical (replacement) or mechanical (fracture, pressure-solution). The goal is to better understand the complex feedbacks between deformation under stress and fluid-mediated chemical transformation in carbonates.



3D view by Xray microtomography of how a rock transforms under hydrothermal condition in nature: a) dolomitization of a calcite crystal assemblage, with dolomite (in black) replacing calcite (in grey) from the borders of each crystals, developing porosity (in blue) to allow fluid to migrate and to replace the core of the host crystal. b) more advanced stage of the transformation, where dolomite tree-like channels (in black) develops from already replaced rock and then isolates small grains of calcite (zoom on c).

✓ ACHIEVEMENT(S)

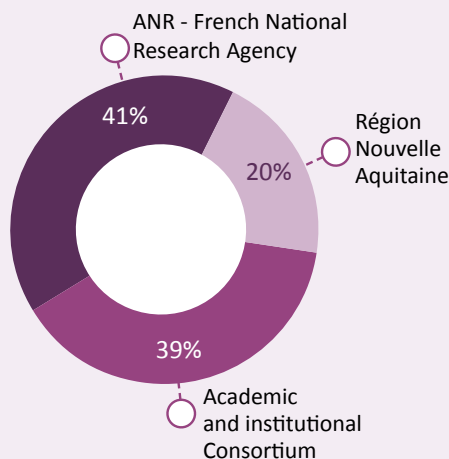
- Use of U-Pb datation method to refine fold-related fracture history (**world premiere**, Beaudoin et al., Geology 46, 2018)
- Validation of the only proxy for assessing burial history of sedimentary reservoirs, with no assumption on thermal history
- Co-organization of scientific sessions at the EGU General Assembly 2018 and 2019 (Vienna)



PolSSol - Dynamics of subsurface politicisation for energy transition



FINANCIAL CONTRIBUTION/YEAR



KEY DATES

- Chair kick-off: April 2018
- Duration: 5 years



TEAM COMPOSITION

- Permanent employees: 2
- PhD: 1
- Post doctorate: 5



LOCALISATION: Pau

- Joint research unit UPPA/CNRS/University of Bordeaux/University of Bordeaux Montaigne/ENSAP Bordeaux - Laboratory PASSAGES



LEADER

- sebastien.chailleux@univ-pau.fr



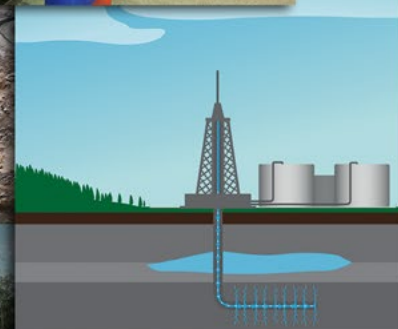
Sébastien CHAILLEUX

I am a political scientist specialized on energy. I developed a research on unconventional oil and gas during my Ph D to outline the role of social mobilization in framing the definition of a public problem. I also suggested how governance tools are able to reshape a public problem in order to make it solvable within a frame more legitimate for policymakers.



PRESENTATION

The Junior Chair analyses the ways the utilizations of the subsurface for energy transition produce or not a politicization, that is how it sets a debate or a conflict about the stakes of a project. Studying the characteristics of the projects (mines, gas or energy waste storage, geothermal production, hydrocarbons) and of the territories, our work outlines the trajectories making some utilizations of the subsurface more credible and legitimate in a given governance frame. Comparing various projects in different settings (metropolitan and overseas), our research enables, on one side, a better understanding of the conflicts through a work on actors' narratives and actions, and on the other side, an analysis of the rigidities of the governance frame, in its local implementation but also in the national debates that may occur. The main goal is to better understand the role of each actor and to use potential conflicts as an opportunity to redefine existing links between local residents and their environment, but also between project promoters and the territories and the scenario for energy transition.



✓ ACHIEVEMENT(S)

Projects of hydrogen storage are only in the exploratory phase and are difficult to assess. Our works underlines technical and legal issues to this nascent industry because the case study shows a project rejected due to uncertainties about mixing hydrogen with methane.

The Junior chair is also developing a research network on the subsurface as well as a serie of seminars on extraction from the subsurface, and coordinates two special issues (one about the politicization of the subsurface in *Natures Sciences Sociétés*, one about mining governance in *Governance*). In the meantime, we will organize three panels about natural resources management in the next International Political Science Association congress, in Lisbon, in July 2020.

📖 BIBLIOGRAPHY

- **Making the subsurface political: How enhanced oil recovery techniques reshaped the energy transition** - Environment and planning C - Online first: doi.org/10.1177/2399654419884077
- **Strategic ignorance and politics of time: how expert knowledge framed shale gas policies** - Critical Policy Studies, 2019 (online first), p.1-19
- **Le rapport, un instrument d'action publique** - Politique et Sociétés, 2019/ 38 (2), p.3-26




Junior Chair with partnership(s)

As all junior chairs, these are directed towards young promising researchers, typically with a research experience of 1-4 years after their Ph.D. The call for applicants is opened and widely publicised internationally.

These chairs can be jointly financed by one (or more) community (ies) and / or one (or more) private partner (s). In this case, the scientific project is set up in concert with the various partners to address their issues of interest.

Recipients are offered a five-years tenure track position and a starting package with a doctoral fellowship, five one-year post-doctoral fellowships and support for direct costs. Chair holders are expected to reach a level allowing for applying to ERC starting grant with success.



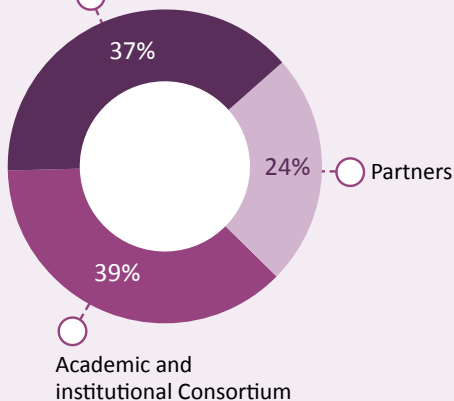


AWESOME - mAnufacturing of neW gEneration Sustainable and therMoplastic coMpositEs



FINANCIAL CONTRIBUTION/YEAR

ANR - French National Research Agency



PARTNERS

- Arkema - Arkema Innovative Chemistry
- Canoe - Centre Technologique Aquitain des Matériaux Avancés et des Composites



KEY DATES

- Chair kick-off: September 2019
- Duration : 5 years



TEAM COMPOSITION

- Permanent employees: 2
- PhD: 1
- Post doctorate: 5



LOCALISATION: Pau

- Joint research unit UPPA/CNRS - Institute of analytical sciences and physical chemistry for the environment and materials (IPREM)



LEADER

- anais.barasinski@univ-pau.fr



Anaïs BARASINSKI

Expert in advanced manufacturing for composite materials, Anaïs Barasinski received her PhD in 2012 from Ecole Centrale Nantes. She graduated in 2007 from Ecole Normale Supérieure de Cachan, where she was laureate of a French Agregation in Mechanical Engineering. Her main area of interest are composite materials, multi-scaled physics, surfaces, modelling, advanced simulation and dialogue between models and experiments.

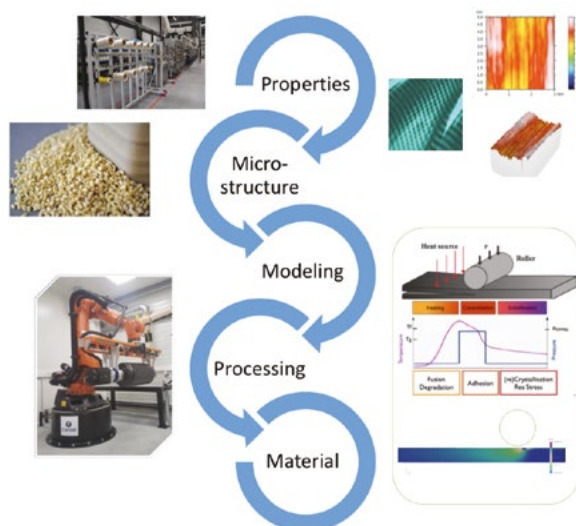


PRESENTATION

The development of thermoplastic composite materials and their processing is an environmental challenge for the years to come. Indeed, they offer an incredible ratio of mechanical performance to density. Moreover, they can very easily be endowed with particular properties, multiple functionalities, and even gradient properties in a wide range of areas. Finally, they are potentially recyclable which makes them suitable candidates for the future in the fields of energy and mobility.

This Chair offers an unique framework by bringing together quality partners with broad and varied skills in regard to the multi-disciplinary approaches required. Each partner is equipped with innovative and complementary

technological platforms and characterizations techniques, going from the matter at its molecular scale, to the constraints of high production rates. The activities of the Chair are based on modelling, engineering, simulation and data analysis, to face an advanced and smart applications that focuses on better exploiting the possibilities offered by composite materials and, in this sense, breaking with what is currently being produced.



A global approach to predict final properties vs material and processing

$$\text{Consolidation criteria} \sim \int_{\text{manuf}}^{\text{process}} T(X_i, Z_i, P_i, v_i, \dots)$$



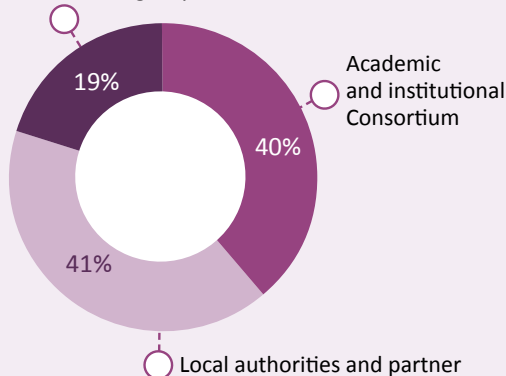
BOIS

Biobased materials



FINANCIAL CONTRIBUTION/YEAR

ANR - French National Research Agency



PARTNERS

- CD 40 - Conseil départemental des Landes



KEY DATES

- Chair kick-off: October 2019
- Duration: 5 years



TEAM COMPOSITION

- Permanent employees: 2
- PhD: 1
- Post doctorate: 5



LOCALISATION: Mont-de-Marsan

- Joint research unit UPPA/CNRS - Institute of analytical sciences and physical chemistry for the environment and materials (IPREM)



LEADER

- eduardo.robles@univ-pau.fr



Eduardo ROBLES

With a previous formation as a Mechanical Engineer, Eduardo Robles got a Ph.D. at the University of the Basque Country UVP/EHU in Renewable Materials Engineering. He focuses his research on clean-transformation of biomass and coproducts of the agroindustry.

He obtained the Cum Laude and International Doctorate mentions, as well as the extraordinary doctorate prize from UPV/EHU. He has published over 20 scientific articles and book chapters and has presented his work in over 30 international conferences.



PRESENTATION

These days, the need for new eco-friendly materials and processes for the industry is more than ever of actuality. The main goal of the Chaire Bois is the valorization of the biomass and coproducts of the industry of the Landes region, especially the forest and the agricultural sector.

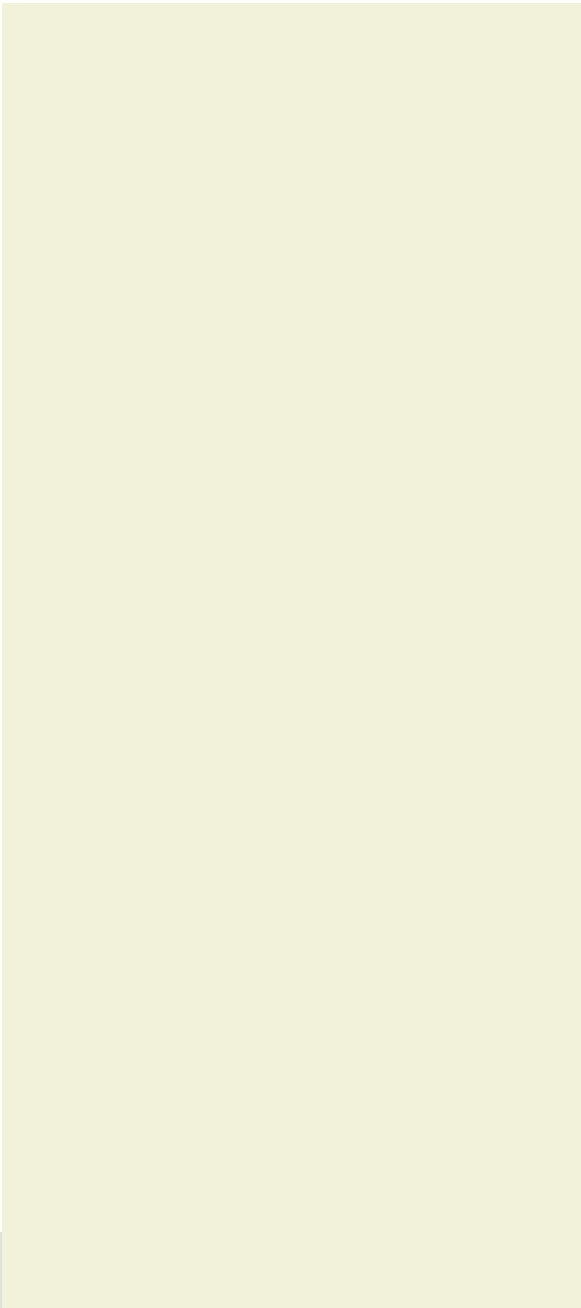
This valorization will help the industry to minimize the undervalued coproducts by offering them new applications, introducing new transformation processes with green chemistry methods, and moving forward to a green economy.





Senior Chair with partnerships

Senior chairs are directed towards well recognised mid-career scientists, typically with an experience of 5-15 years after their Ph.D. Faculty members of E2S UPPA can apply, but new faculty members can be recruited too. In this case, they are offered a five-years tenure track appointment. Senior chairs should involve public or/and private partnerships allowing for shared support with E2S UPPA. Within each chair, scientific projects are addressed by a group composed of three doctoral students and two to four permanent researchers. Additional money is also provided for direct costs.

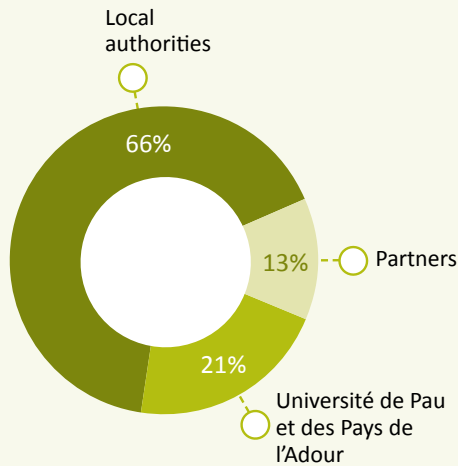




Architecture and urban physics



FINANCIAL CONTRIBUTION/YEAR



PARTNERS

- CAPB - Communauté d'Agglomération Pays Basque
- Nobatek/INEF4 an energetic transition institut
- RNA - Région Nouvelle Aquitaine



KEY DATES

- Chair kick-off: January 2017
- Duration: 5 years



TEAM COMPOSITION

- Permanent employees: 1
- PhD: 3
- Post doctorate: 3



LOCALISATION: Anglet

- UPPA's research unit - Multidisciplinary Institute for Applied Research



LEADER

- benoit.beckers@univ-pau.fr



Benoît BECKERS

Benoît Beckers has a background in Physical Engineering, and a doctorate from the architecture school of the Polytechnical University of Catalogna. Before joining the UPPA, he directed a research team in the «Urban systems engineering» department of the Technological University of Compiègne.



PRESENTATION

Benoît Beckers holds the chair in "Architecture and Urban Physics" located at ISA BTP in Anglet. The UPPA, the technology center Nobatek/INEF4, the New Aquitaine region and the Communauté d'Agglomération Pays Basque came together to create a "joint laboratory" hosting this chair.

When half of humanity lives in cities, the theories and models that we have built so far no longer apply as they do not take into account the urban dimension. Talking about sustainable construction while encouraging urban sprawl is meaningless. We need to move up to a larger scale, to change our point of view, especially by using physics and the digital tools that we now have at hands.

The goal of this chair is to design innovative digital models that take into account not only the architectural dimension, but also data on human motion, accoustics, sunlight... Urban physics requires an interdisciplinary approach! The new chair relies on both the capabilities of the SIAME laboratory (Engineering Science Applied to Mechanics and Electrical Engineering) and the experience and expertise of Nobatek in sustainable construction.

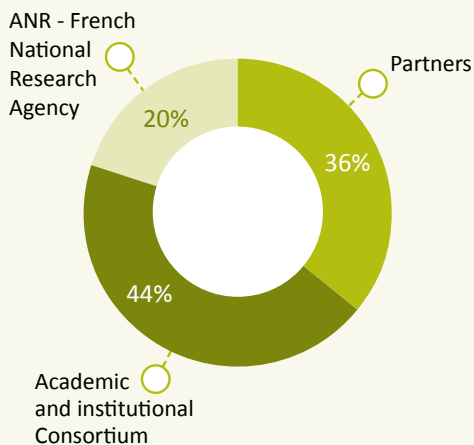


CO2ES

CO₂ Enhanced Storage



€ FINANCIAL CONTRIBUTION/YEAR



PARTNERS

- BRGM - Bureau de Recherches Géologiques et Minières
- CNES - Centre National d'Etudes Spaciales
- TOTAL E&P Recherche et Développement SAS



KEY DATES

- Chair kick-off: November 2018
- Duration: 5 years



TEAM COMPOSITION

- Permanent employees: 3
- PhD: 4
- Post doctorate: 2



LOCALISATION: Anglet

- Joint research unit UPPA/TOTAL/CNRS - Laboratory for complex fluids and their reservoirs (IPRA - LFCR)



LEADER

- fabrizio.croccolo@univ-pau.fr



PRESENTATION

Global warming is one of the major concerns of humankind and scientists are alerting the community to the need of actions to limit the greenhouse gas emissions to the atmosphere.

Carbon capture, utilization and storage (CCUS) is aiming at reducing CO₂ concentration in the atmosphere and CO₂ storage is a promising action towards this goal. Various mechanisms contribute to CO₂ storage in a reservoir as a function of time.

The CO2ES Industrial Chair focuses on CO₂ storage by dissolution in deep aquifers to understand how fast and efficient it is in relation to gravitational instability and other unconsidered effects.

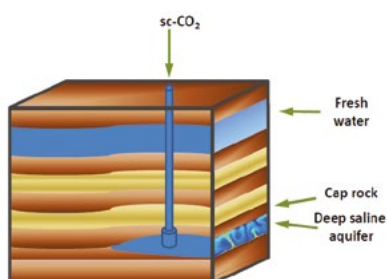
CO2ES will improve our understanding of the CO₂ trapping and transport processes involved in CO₂ geological storage in order to design more efficient and safer large-scale projects.

Those research activities are developed through 2 postdoctoral and 4 PhD students in close collaboration with the Industrial and institutional partners as well as international researchers.



Fabrizio CROCCOLO

Expert in non-equilibrium thermodynamics, optical techniques and microgravity experiments, Fabrizio Croccolo got a PhD in Milan, in 2006, and came to Anglet in 2009. After completing his Marie-Curie Fellowship in Fribourg (CH) in 2012, he came back to UPPA and developed an experimental activity related to transport properties of complex fluids.





CO2ES Workshop #1
Convective dissolution of CO₂ in brine:
experiments and simulations
5-6 November 2019 - Anglet (FR)

6 November 2019

INVITED SPEAKERS

- Arantxa ALONSO, Technical University of Catalonia (ES)
- Yves MEHEUST, Univ. of Rennes (FR)
- Patrice MEUNIER, Univ. of Marseille (FR)
- Sylvain THIBEAU, TOTAL SA (FR)
- Alberto VAILATI, Univ. of Milano (IT)
- Denis VOSKOV, Univ. of Delft (NL)
- Anne DE WIT, Univ. of Bruxelles (BE)
- Ralph HAESE, Univ. of Melbourne (AUS)
- Moderated by:
- Fabrizio CROCCOLO, Univ. of Pau (FR)

A series of seminars from top scientists and Industrials, organised by the CO2ES Industrial Chair of E2S UPPA

Two days of brainstorming about innovative solutions for CO₂ storage in deep saline aquifers

Experimental and simulation scientists from all over Europe will meet Industrials to share ideas about CO₂ storage in deep aquifers and more specifically about convective dissolution, i.e. how thermodynamic conditions affect the convection as an accelerating factor for dissolution of huge quantities of CO₂ in deep saline aquifers.

Sponsored by:



ACHIEVEMENT(S)

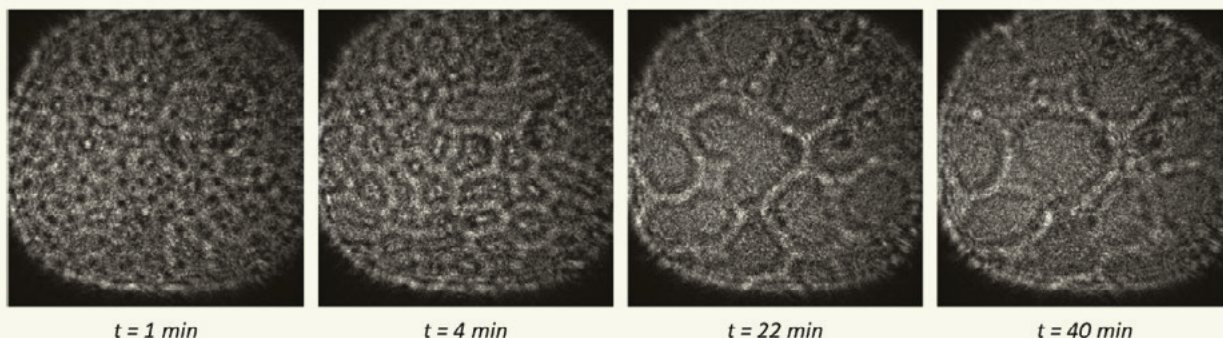
- CO2ES participated to the DCMIX4 experience on the measurement of the transport properties of complex fluids, carried out in a low gravity environment on the ISS.
- F. Croccolo is the coordinator of an international project gathering the universities of Milano, Bayreuth and Complutense in Madrid, supported by the European Spatial Agency.



BIBLIOGRAPHY

Overall, the chair already published 8 refereed papers (4 in Phys. Rev. E) among which:

- García-Fernández, P. Fruton, H. Bataller, J.M. Ortiz de Zárate, and F. Croccolo, **Coupled non-equilibrium fluctuations in a polymeric ternary mixture**, Eur. Phys. J. E 42, 124 (2019).
- D. Brogioli, F. Croccolo, and A. Vailati, **Cylindrical flowing-junction cell for investigating miscible fluids**, Rev. Sci. Instrum. 90, 085109 (2019).
- A. Mialdun, H. Bataller, M.M. Bou-Ali, M. Braibanti, F. Croccolo, A. Errarte, J.M. Ezquerro, J.J. Fernández, Y. Gaponenko, L. García-Fernández, J. Rodríguez, and V. Shevtsova, **Preliminary analysis of Diffusion Coefficient Measurements in ternary mixtures 4 (DCMIX4) experiment on-board the International Space Station**, Eur. Phys. J. E 42, 87 (2019).



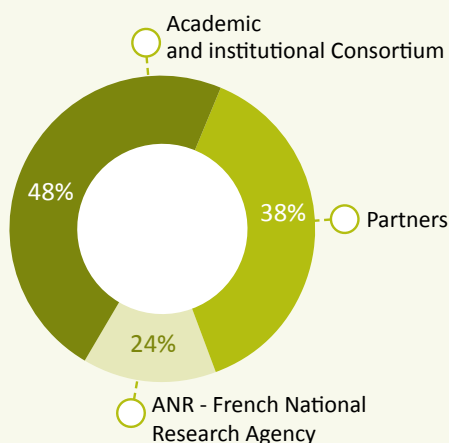
CO₂ convection



Ecotox - Ecotoxicology of chemical contaminants in inland waters in the context of global change



FINANCIAL CONTRIBUTION/YEAR



PARTNERS

- TOTAL E&P Recherche et Développement SAS
- Rio Tinto



KEY DATES

- Chair kick-off: September 2019
- Duration: 5 years



TEAM COMPOSITION

- Permanent employees: 2
- PhD: 3
- Post doctorate: 1



LOCALISATION: Pau

- Joint research unit UPPA/CNRS - Institute of analytical sciences and physical chemistry for the environment and materials (IPREM)



LEADER

- severine.le-faucheur@univ-pau.fr



Séverine LE FAUCHEUR

Séverine Le Faucheur is an aquatic biogeochemist and ecotoxicologist specialized in metal-microorganisms. She received her PhD from ETH Zürich (Switzerland) in 2005 and was a postdoctoral fellow at INRS-ETE (Canada) between 2006-2011. Before arriving in September 2019 at UPPA, she was a senior researcher and teaching assistant at the University of Geneva (Switzerland). Besides being the Ecotox Chair holder, she currently also is an adjunct professor at INRS-ETE. With her positions as European Co-chair of the SETAC Global Mercury Working Group, as committee member of the SETAC Metals Interest Group and as editor for Environmental Science and Pollution Research journal (Springer), Séverine is very active within the scientific community.



PRESENTATION

The planet is currently experiencing significant global changes related to human activities which leads to the deterioration of the quality of continental waters. Temporal hydrological variability, the presence of complex mixtures of contaminants in water or the impact of contaminants on the global ecosystem functioning are examples of problematics that have been poorly addressed in environmental risk assessment. The present research partnership Chair, in collaboration with Total and Rio Tinto, focuses on filling these gaps with the development of fundamental knowledge and practical tools to assess water quality. That research is based on the use of artificial rivers located in PERL at Lacq and state-of-the art analytical techniques available at IPREM. Three main themes are examined, i.e., the bioavailability and impacts of contaminant mixture towards aquatic organisms, the use of biominerals as bioindicators of contaminant exposure and the assessment of ecogenomics as biomonitoring tool.

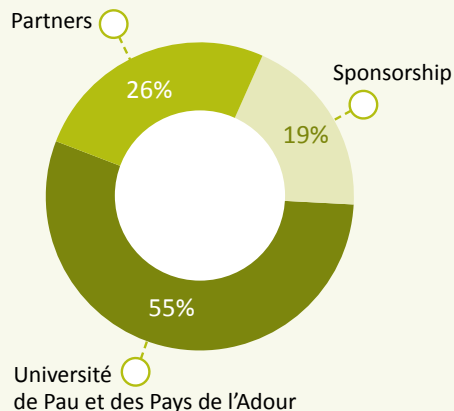




HCP - History, Cultures and Heritage



FINANCIAL CONTRIBUTION/YEAR



PARTNERS

- Caisse Régionale Crédit Agricole Pyrénées Gascogne
- Caves de Buzet
- Centre International de Communication Artistique Contemporaine de Laverdens
- Dartigalongue & fils
- Fortum France
- Maison de la Montagne
- Towns : Buros, Condom, Saint-Sever



KEY DATES

- Chair kick-off: October 2014
- Duration: 5 years



TEAM COMPOSITION

- Permanent employees: 2
- PhD: 2
- Post doctorat : 1



LOCALISATION: Pau

- UPPA's research unit - Identities, territories, expression, mobility (ITEM)



LEADER

- laurent.jalabert@univ-pau.fr



Laurent JALABERT

Teaching fellow (1991) and Doctor in History (1997) then HDR1 recipient (2006), Laurent Jalabert has been a Lecturer-Researcher in Contemporary History at UPPA since 2010. He previously worked at the Université de Toulouse Jean-Jaurès, at the Université des Antilles Indies and at the Université de Nantes, as well as at Science Po Paris. Specialist in contemporary history (European political and cultural history) and expert for the French National Agency for Research, the HCERES and MSH, he has directed/directs partnership programs (EU/FEDER, EU POctefa, EU Interreg, AUF FICU-PAS etc.) He also holds the status of Visiting Professor at the RGGU (Moscow), the University of Utrecht (Netherlands), the National University of Costa Rica, the National University of Haiti and the University of Concordia (Montreal, Canada).



PRESENTATION

The Chair "History, Cultures and Heritage" aims to support and promote the development of research programmes related to heritage and cultural policies, as well as education through research at Master and PhD levels, at the UPPA.

This Chair is a place for research, reflection and contribution on issues related to heritage and its value, altogether in relation with private and public partners.

Projects are carried out in connection with the ITEM laboratory. They deal with material, architectural, industrial, rural, memory and intangible heritage. They sometimes respond to specific requests from companies or local authorities.

The Chair will allow the dissemination of research on heritage and the development of new programmes on that subject.

It also aims to strengthen links between research, education and the professional sector, particularly with companies, associations and foundations seeking to promote their own heritage.



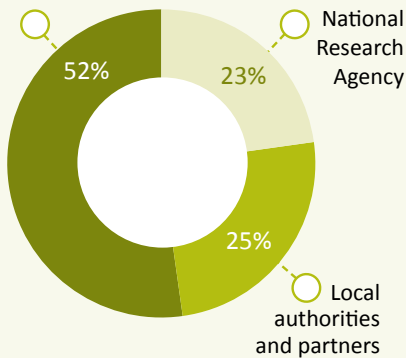
HPC Waves

High Performance Computing of Waves



FINANCIAL CONTRIBUTION/YEAR

Academic and institutional Consortium



PARTNERS

- CAPB - Communauté d'Agglomération Pays Basque
- RNA - Région Nouvelle Aquitaine



KEY DATES

- Chair kick-off: January 2019
- Duration: 5 years



TEAM COMPOSITION

- Permanent employees: 3
- PhD: 3
- Post doctorate: 1



LOCALISATION: Anglet

- UPPA's research unit - Laboratory for applied sciences in mechanics and electrical engineering (IPRA - SIAME)



LEADER

- volker.roeber@univ-pau.fr



Volker ROEBER

Volker Roeber is specialized in numerical modelling of nearshore waves. He received his PhD in Ocean Engineering from the University of Hawaii. He was Assistant Professor at Tohoku University, Japan, where he worked on wave-driven catastrophic events. He is also an Affiliate Graduate Faculty member in the Department of Oceanography at the University of Hawaii.

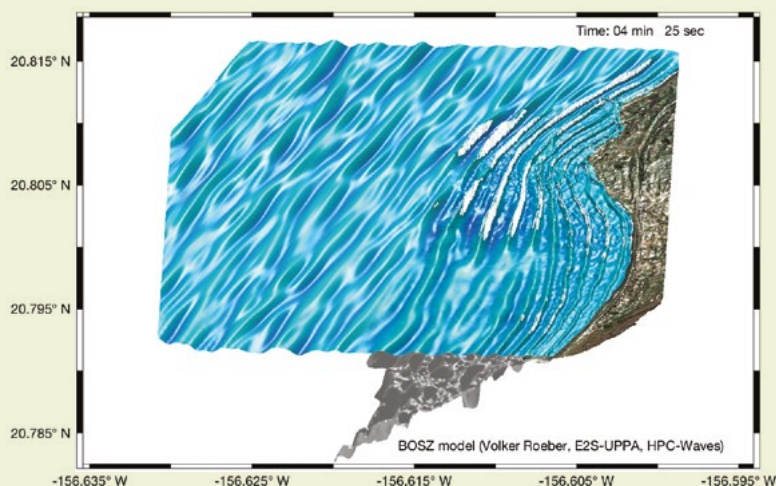


PRESENTATION

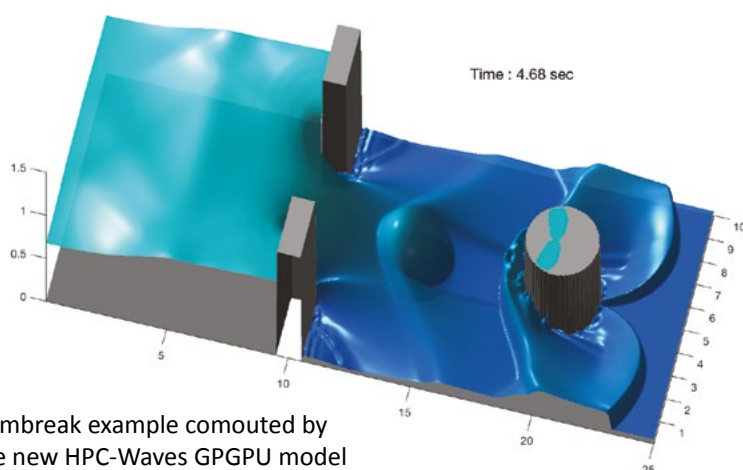
Coastal communities have been facing on-going problems associated with large ocean swell waves, which result in coastal flooding, hazardous currents, infrastructure damage, and erosion. On the positive side, energetic waves can make a vital contribution to marine renewable energy (MRE) systems. To understand the hazards on one side and the potential for marine energy on the other, quantitative assessment is necessary. The chair focuses on the theoretical and numerical development of nearshore wave models with attention to high performance computing. We are improving both accuracy and speed of numerical wave models to obtain a representative and complete description of coastal wave processes including generation, propagation, and run-up, as well as the waves' impact on structures and their potential for MRE extraction. This work is complemented by field and laboratory studies. In close collaboration with governmental and private agencies for coastal zone management in the Basque country, the chair helps to find integrated solutions for mitigation of wave-driven coastal hazards and investigate local MRE applications.



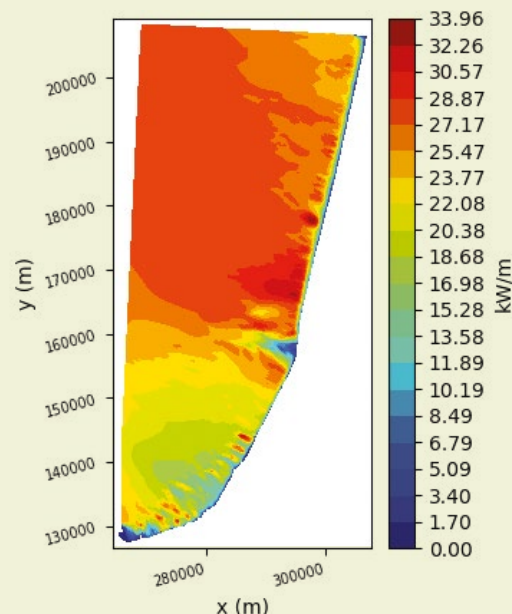
HPC-WAVES
HIGH PERFORMANCE COMPUTING OF WAVES



Typical nearshore wave field with refraction, shoaling, and wave breaking as computed by the BOSZ model, a phase-resolving Boussinesq-type model developed by the chaire.



Dambreak example computed by the new HPC-Waves GPGPU model



Mean wave energy computed from a 44-year hindcast along the Côte Basque in the Bay of Biscay.



ACHIEVEMENT(S)

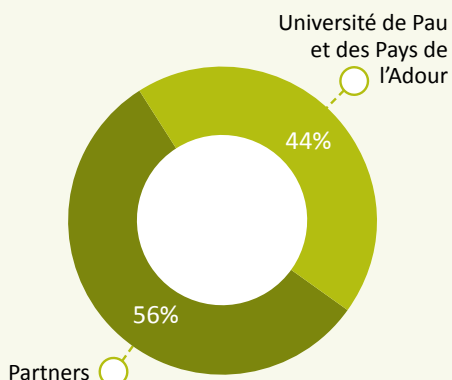
- We have developed the foundation for a new suite of numerical models, which can compute nearshore waves in an accurate but also very fast way utilizing the potential of GPUs (graphic cards). This numerical framework is being continuously extended to improve the computations of water waves in the coastal zone with special focus on the Côte Basque. The numerical models developed are presently incorporated into wave runup forecasting systems for Grande Plage (Biarritz) and West Maui (Hawaii).
- The team has also completed the first step towards a potential installation of a Wave Energy Converter (WEC) along the Côte Basque.
- The chair contributed to the Best Student Paper awarded at the Coastal Structures conference 2019 in Hannover, Germany.
- We have teamed up with researchers and engineers from Rivage Protech (SUEZ group) and AZTI Tecnalia (Spain) to collaborate in multilateral research efforts.



IMAGE - X-ray imaging



FINANCIAL CONTRIBUTION/YEAR



PARTNERS

- TOTAL E&P Recherche et Développement SAS
- TOTAL SA



KEY DATES

- Chair kick-off: September 2013
- Duration: 5,5 years



TEAM COMPOSITION

- Permanent employees: 3
- PhD: 1
- Post doctorate: 2



LOCALISATION: Pau

- Joint research unit UPPA/CNRS - Development of experimental methodologies for Petroleum engineering professions (IPRA - D-MEX)



LEADER

- peter.moonen@univ-pau.fr



Peter MOONEN

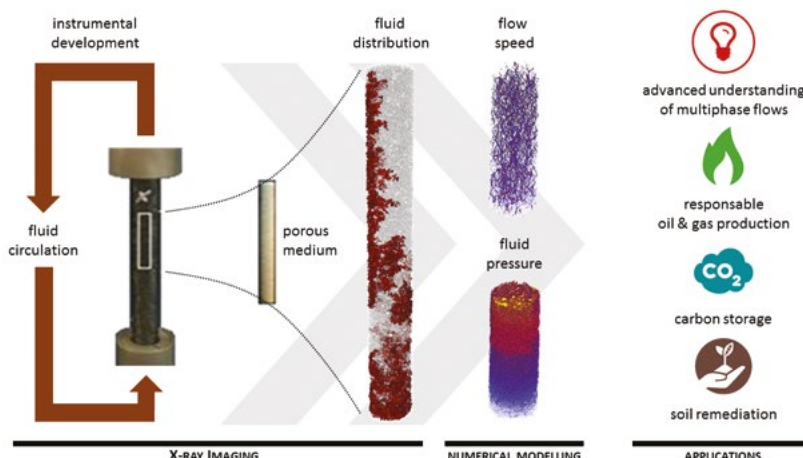
Besides being the holder of the X-ray imaging Chair, Peter directs the ISO-certified DMEX Centre for X-ray Imaging (UMS 3360) which provides researchers with an easy access to state-of-the-art X-ray imaging tools, and he is the scientific coordinator for UPPA's access to the D50 neutron imaging beamline at ILL (Grenoble, France).



PRESENTATION

The Chair was created in September 2013 with the aim to investigate multiphase flow in porous media. This fundamental topic underlies both civil engineering applications like durability of construction materials as well as typical geosciences applications like the behaviour of bio-methane in underground aquifers or the responsible production of oil and gas.

To tackle such transdisciplinary challenges, a state-of-the-art X-ray imaging lab was created, the DMEX Centre for X-ray Imaging (UMS 3360), which is ISO 9001-certified since 2017. Data analysis relies heavily on a collaboration with the Laboratory of Mathematics (UMR 5142 LMAP), which specializes in the development of algorithms for computing flows in complex geometry on moderate computational resources. Thematically, the Chair maintains close relations with the Laboratory of Thermodynamics and Energetics of Complex Fluids (UMR 5150 LFCR) and the energy company Total.





✓ ACHIEVEMENT(S)

- Relative permeability is a physical property describing the ease to displace one (fluid) phase in the presence of another phase that is coexisting in the pore space. This property is experimentally determined by means of core-flooding experiments, and it underlies applications such as oil and gas production or soil water transport for irrigation.
- Franck Nono, a postdoc at the Chair and currently employed at Modis, revealed that these routine tests are much less controlled than previously assumed. More precisely, he showed that the actual boundary conditions during a so-called USS-flow experiment greatly differ from the theoretically assumed ones, potentially yielding inaccurate predictions of the relative permeability and likely having an important impact on the prediction of the production behavior of oil fields.
- Convinced about the importance of these observations, one of the leading software vendors in the field announced they would include the observed phenomenon in their next release.

📖 BIBLIOGRAPHY

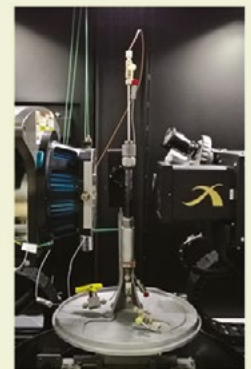
- **Multiphase flow imaging through X-ray microtomography: reconsideration of capillary end-effects and boundary conditions** - 33rd International Symposium of the Society of Core Analysts (SCA), Pau, France, August 26-30, 2019 - F. Nono, P. Moonen, H. Berthet, R. Rivenq

Microfluidics setup for in-situ testing



Experimental control
and data logging

Syringe pumps for controlling
oil and brine flow & backpressure



X-ray transparent
test cell

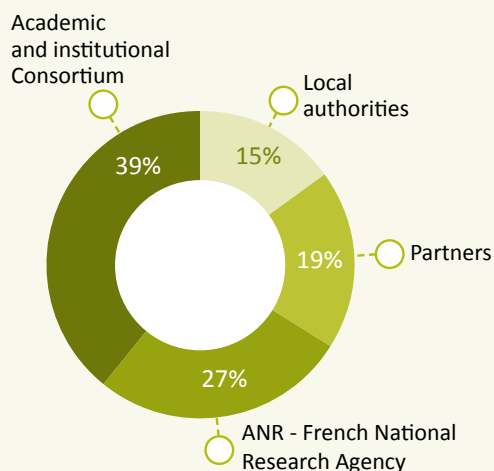


MANTA - Marine Materials

Development of bio-inspired and sustainable (bio)materials to lower the marine environmental impact



FINANCIAL CONTRIBUTION/YEAR



Susana FERNANDES

Susana FERNANDES is Associate Professor at UPPA (after 2 years at KTH, Sweden as a Marie Curie IE Fellow) where she has set up the chair MANTA. She is also a Guest Researcher at Uppsala University, SE. She has a 12 years research experience in polymeric materials from renewable resources and blue biotechnology, acquired in recognized academic laboratories in 4 European countries. She has disseminated her work via over 50 articles and book chapters (h-index=23), and over 40 conferences and media appearances. To make it all possible, she has also won several prestigious awards and prizes totaling €3Million.



PARTNERS

- Biarritz Lab - Laboratoires de Biarritz
- CAPB - Communauté d'Agglomération Pays Basque
- CIDPMEM 64-40 - Comité Interdépartemental des Pêches Maritimes et des Elevages Marins
- LEES - Laboratoire d'Etudes en Entropie Sous-marine
- RNA - Région Nouvelle Aquitaine



KEY DATES

- Chair kick-off: December 2018
- Duration: 5 years



TEAM COMPOSITION

- Permanent employees: 4
- PhD: 4
- Post doctorate: 2



LOCALISATION: Anglet/Pau

- Joint research unit UPPA/CNRS - Institute of analytical sciences and physical chemistry for the environment and materials (IPREM)



LEADER

- susana.fernandes@univ-pau.fr



PRESENTATION

The research flow of MANTA is on the exploration of marine compounds, materials and biomimetics to face current societal problematic related to human health and marine environment degradation.

Oceans are an extraordinary and unexploited sustainable source of natural compounds with specific and very appealing physicochemical, structural and biological properties. Although very promising, a considerable amount of these compounds are still scarcely exploited. In this context, MANTA focuses on blue and red biotechnologies for the development of (bio)materials exploiting both marine origin materials and marine biomimetic approaches. We are establishing methodologies for the extraction of small molecules and biopolymers from marine by-products aiming for their processing as multifunctional porous structures, films, hydrogels and composite materials for cosmetic, biomedical and packaging applications. The impact of these (bio)materials and/or their metabolites on human health and on aquatic ecosystems is also addressed.



ACHIEVEMENT(S)

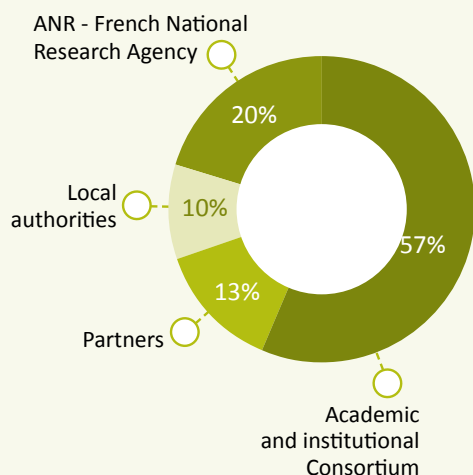
- The chair is still rather young but we have already been invited to spread MANTA's project and results in international scientific congresses-namely FARNET 2018, BIOPOL 2019 and Rendez-vous de Concarneau 2019; and in other events beyond the scientific community like the 'Forum Changer D'ère', the G7 Biarritz 'Ocean our Future' Forum, and many other events.
- S. Fernandes is also Member of the Steering Committee of the future Excellence center on Marine Biomimetism that is expected to host MANTA's team, IPREM Ocean, the new flagship master degree on Bio-Inspired Materials (BIM), Ceebios and a few small companies working on marine bioresources valorization and marine biomimetics.



MOVE - Mobility evolution towards sustainable



FINANCIAL CONTRIBUTION/YEAR



PARTNERS

- CAPB - Communauté d'agglomération du pays basque
- CCLO - Communauté de communes Lacq-Orthez
- CAPBP - Communauté d'agglomération Pau Béarn Pyrénées
- SMPBA - Syndicat des Mobilités Pays Basque - Adour
- SDEPA - Syndicat d'Énergie des Pyrénées-Atlantiques
- Enedis
- Terega
- EDF
- CR - Commission de régulation de l'énergie



KEY DATES

- **Chair kick-off:** January 2020
- **Duration:** 5 years



TEAM COMPOSITION

- **Permanent employees:** 2
- **PhD:** 3
- **Post doctorate:** 5



LOCALISATION: Pau

- UPPA's research unit - PDP



LEADER

- louis.defontenelle@univ-pau.fr



Louis DE FONTENELLE

After a one-year post-doctorate at Terega (a natural gas transmission and storage company), Louis de Fontenelle joined the Pau Public Law Laboratory. He is currently co-director of the research programme into energy law, and coordinator of the "Pau Energy Law" public-private consortium. Since September 2016, he has published numerous articles on energy law. He regularly organizes scientific exhibitions related to energy transition and speaks at national and European conferences on this issue. He is the chief scientific officer on two multidisciplinary projects and the scientific director of the website "Energie en lumière".



PRESENTATION

The MOVE project relies first and foremost on the creation of a legal research cluster dedicated to studying the interactions between the energy transition and mobility through the lens of sustainable development. The reflections will focus as much on urgent issues as on concerns for the near or more distant future (legal forward studies).

Considering the societal impact of this topic, an applied research methodology will be used. The scientific objectives will be defined in keeping with the concerns of the public and private stakeholders involved in sustainable mobility. These stakeholders will help to determine these objectives, and the research will be conducted in close connection with the actions and experiments involved in their actual projects.

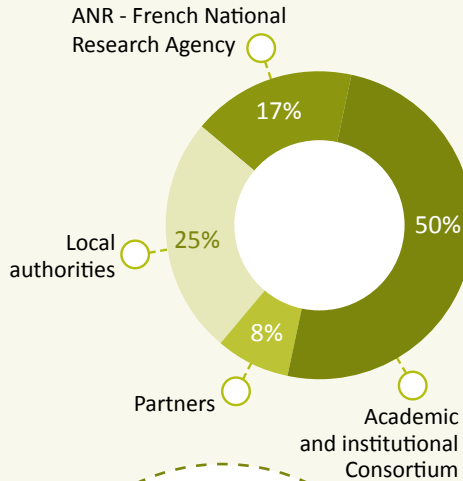
In addition to this legal approach, the societal challenges to be studied demand an overall understanding of the various issues involved in developing sustainable mobility, whether related to technological progress, social transformation or the development of the economic models required for this type of approach. In this respect, the legal expertise developed in the framework of the MOVE project will be made available for research carried out in other fields with the aim of anticipating potential hurdles and obstacles, or, on the contrary, identifying opportunities, related to the normative framework of reference.



DESDM - Distributed Energy System Data Management



FINANCIAL CONTRIBUTION/YEAR



PARTNERS

- RNA - Région Nouvelle Aquitaine
- CAPB - Communauté d'agglomération du pays basque
- Bertin - BERTIN Technologies



KEY DATES

- Chair kick-off: June 2019
- Duration: 5 years



TEAM COMPOSITION

- Permanent employees: 3
- PhD: 2
- Post doctorate: 5



LOCALISATION: Anglet

- UPPA's research unit - Laboratory of computer science (LIUPPA)



LEADER

- richard.chbeir@univ-pau.fr



Richard CHBEIR

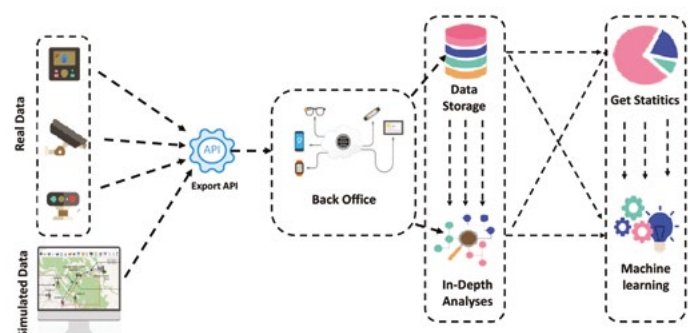
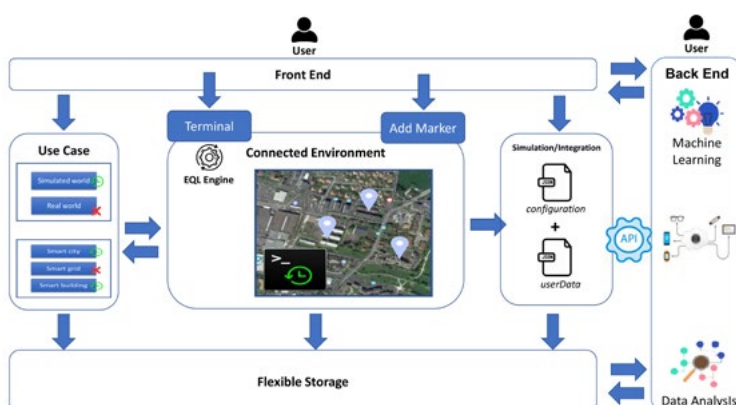
Richard Chbeir is currently a Full Professor in the Computer Science Department at the UPPA and the head of the LIUPPA lab. His current research includes data management, information retrieval, data semantics, access control, and digital ecosystems. He is also the Chairman of the French Chapter ACM SIGAPP.



PRESENTATION

The DESDM chair intends to provide concrete solutions to the collection of massive data in a connected environment and/or electrical network. Hereafter are the different objectives of the chair:

- **Scientific purpose:** Design, implement and deploy software solutions on both a small and large scale in order to better collect/aggregate data, produce information, discover new knowledge and automate decision-making (partly or completely).
- **Training:** Share good practices. The chair is a place for reflection, sharing and training, where awareness can be raised.
- **Transfer:** Helping companies and local authorities to solve their problems by offering them advice and solutions, particularly in relation with data.
- **Strategic:** Develop an open software platform capable of both scaling up and optimizing the functioning of its connected environments.



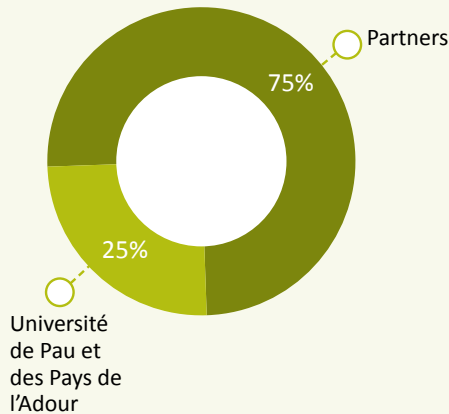


GEOLOGY I et II

Quantitative Structural Geology



FINANCIAL CONTRIBUTION/YEAR



PARTNERS

- TOTAL E&P Recherche et Développement SAS
- TOTAL SA



KEY DATES

- Chair kick-off: 2011
- Duration: 5 years + 5 years



TEAM COMPOSITION

- Permanent employees: 2
- PhD: 11
- Post doctorate: 23



LOCALISATION: Pau

- Joint research unit UPPA/TOTAL/CNRS - Laboratory for complex fluids and their reservoirs (IPRA - LFCR)



LEADER

- jean-paul.callot@univ-pau.fr



Jean-Paul CALLOT

JP. Callot earned a Ph.D. in geodynamics at ENS Paris in 2002. After 9 years at IFP-EN, specialized in fold and thrust belts, salt tectonics, analog modelling, and fluid/rock interactions, he became professor at Univ. of Pau&Pays Adour. He coauthored more than 70 papers with 16 PhD students.



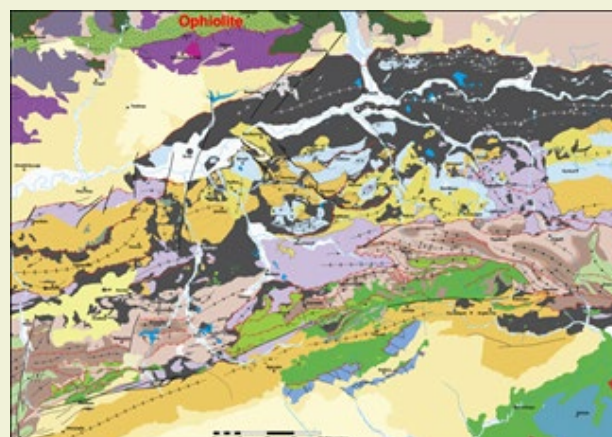
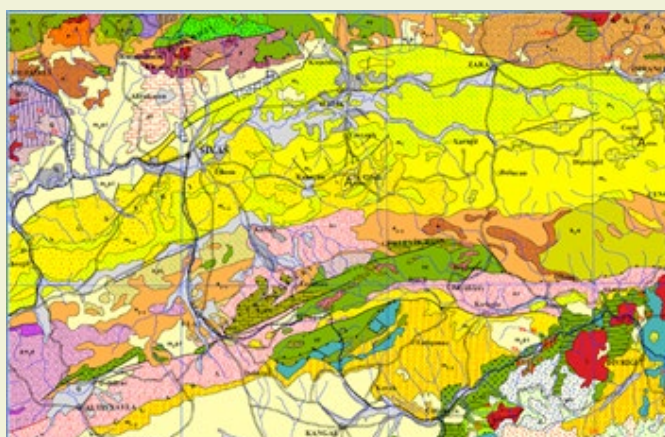
PRESENTATION

The Structural Geology Chair materializes a strong scientific partnership between Total and the LFCR. The chair's topics, jointly chosen by the Chair and Total's Scientific experts, are scopes of PhD and Postdoctoral projects. These projects aim at both academic results and publications, as well as applied conclusions in line with industrial purposes. In that frame, the PI is also involved in consultancy and expertise, while keeping in touch with the societal needs. The first phase of the chair (2011-2016) was largely focused on salt tectonics, with important implications for exploration issues in passive margins, and fold and thrust belt development. The second phase (2016-2021), in line with the LFCR and E2S-UPPA, focuses on shale tectonics, the follow-up of the study of orogeny, and fluid rock interaction. In the course of those 8 years, 12 PhDs and 20 Postdocs have participated to >25 papers, >130 communications, and more than 12 contributions to industrial development and formation.



✓ ACHIEVEMENT(S)

In 2011, the Sivas Basin (Turkey) was unearthed, its salt origin recognized, and its geology revisited in the light of the last decades of salt tectonics, seismic imaging and frontier exploration (Angola, Gulf of Mexico, etc.). In 8 years, four PhDs allowed to completely revise the geological map (half the size of Corsica) and the kinematic scenario thanks to the fantastic outcrops, satellite images of very good spatial resolution, and a set of 2D seismic lines acquired across the basin in 2012. It has been shown to be the most spectacular and rich outcropping salt basin, with outstanding exposures of most of the classic, salt-related structures, which are classic cause of failure and sometimes success in exploration: halokinetic sequences and folds, flaps, diapirs and salt sheets, salt wall and welds, primary and secondary minibasins, canopy (Ringebach et al., 2013; Callot et al., 2014; Ribes et al., 2015 & 2016; Kergaravat et al., 2016 & 17; Pichat et al., 2018 ; 2019 ; Legeay et al. 2019).



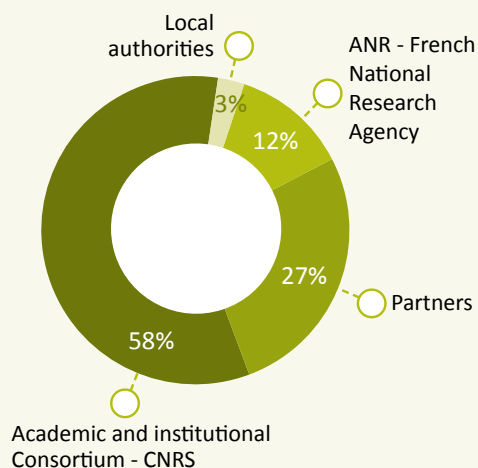
Comparison between the existing 1/200000 scale map, basis of the project, and the final map resulting from the combined work of four PhDs (see Legeay et al. 2019a, b). The improved complexity arises from detailed mapping, datings and recognition of timelines, chemical analysis of major as well as exotic elements and structural and sedimentological correlations.



TEEN - Territories in energy and environmental transitions



€ FINANCIAL CONTRIBUTION/YEAR



PARTNERS

- CAPBP - Communauté d'Agglomération Pau Béarn Pyrénées
- CACG - La Compagnie d'Aménagement des Coteaux de Gascogne
- TOTAL E&P Recherche et Développement SAS



KEY DATES

- Chair kick-off: September 2018
- Duration: 5 years



TEAM COMPOSITION

- Permanent employees: 3
- PhD: 4
- Post doctorate: 3



LOCALISATION: Pau

- Joint research unit UPPA/CNRS/University of Bordeaux/University of Bordeaux Montaigne/ENSAP Bordeaux - Laboratory PASSAGES



LEADER

- xavier.arnauld@univ-pau.fr



Xavier ARNAULD DE SARTRE

Xavier Arnauld de Sartre is a geographer, Director of Research at the CNRS (CNRS bronze medal in 2008). His researches focus on the transformations of modernity due to global changes. He coordinated various industrial or academic projects, has served in many national scientific or institutional committees, authored 37 publications in international peer-reviewed journals, 3 books, and edited 9 publications.



PRESENTATION

TEEN Chair aims at developing pathways to solve some of the current energy transition problems. Indeed, even if the current context suffers from strong uncertainties and even if we do not know yet where the transition will lead our societies to, we do know that territories are about to play a major part in the implementation of transitions allowing to link global and local scales. Nevertheless, this objective is confronted to a strong political, technical and institutional obduracy and to the many socio-technical controversies surrounding transition technologies. Our objective, directed to stakeholders, is to give them support to infuse their actions with territorial meaning, in order to make them think their ongoing projects as responding both to global and local stakes.



ACHIEVEMENT(S)

- Organisation of thematic events on the theme of the Chair: Study day focused on “Populations and global changes - Contemporary environmental mobilizations”, on September 27th, 2019
- Organisation of a seminar cycle, with the Chair’s partners and on the themes of the Chair (theories of transitions, socio-technical controversies, the politicization of transitions and local development).
- Conferences focused on social acceptability.
- Participation in a seminar on epistemic communities, focused on the relations between Men and their environment.



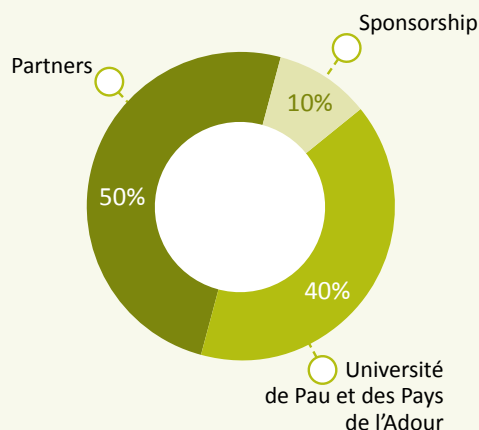
SHORT BIBLIOGRAPHY

- **How ecosystem services and agroecology are greening French agriculture through its reterritorialization, Ecology and Society, 24, 2.** Xavier ARNAULD DE SARTRE, Marion CHARBONNEAU, Orianne CHARRIER, Orianne, 2019 - <https://doi.org/10.5751/ES-10711-240202>



OPTIMA - Observatory of Local Pilotage and Managerial Innovation

€ FINANCIAL CONTRIBUTION/YEAR



PARTNERS

More than 30 partners from the following categories:

- County councils (31,32,40,47,64)
- Intercommunity councils
- Towns
- Fire and Rescue Department Services
- Insurances companies
- Other companies
- Other actors



KEY DATES

- **Chair kick-off:** March 2014
- **Duration:** 3 years + 3 years



TEAM COMPOSITION

- **Permanent employees:** 4
- **PhD:** 13
- **Post doctorate:** 6



LOCALISATION: Pau

- UPPA's research unit - Center for research and management studies (CREG)



LEADER

- david.carassus@univ-pau.fr



PRESENTATION

The OPTIMA Chair is a link between local actors (elected territorial civil servants), and the researchers at the Université de Pau et des Pays de l'Adour, specialists in local public management.

Our objectives :

- Establish an observatory of local managerial innovation and management to better identify and understand practices.
- Support local authorities in the implementation of these innovative practices.
- Share these innovations locally and nationally, between academics and practitioners.
- Establish a collaborative laboratory for the manufacture of local innovation, and propose innovative tools and operating methods that respond to changes in the local context.



David CARASSUS

David Carassus is interested in managerial innovation at the local level, in the management of local policies, multi-partner governance, and resource optimization as well as in the quality of life at work.


He is the organizer of the "Entretiens de l'Innovation Territoriale", which brings together the visions of academics and practitioners. On average, 300 people participate annually in this event. The OPTIMA Chairholder also carries out research and intervention in the form of partnership agreements with local authorities, which have generated more than 1.5 million euros over 2015-2018.





International Academic Guest Chair

International chairs are part time visiting professor positions. Applicants should have a track record demonstrating their high-level scientific achievements and strong international visibility. The call for applicants is opened and widely publicised internationally. Laureates are appointed for five years upon recommendation of the external scientific committee of E2S UPPA. Recipients commit themselves to spending on average two months per year at the UPPA. Two doctoral fellowships and five years of postdoctoral fellowship are offered in order to strengthen the relationships between their group and our laboratories.

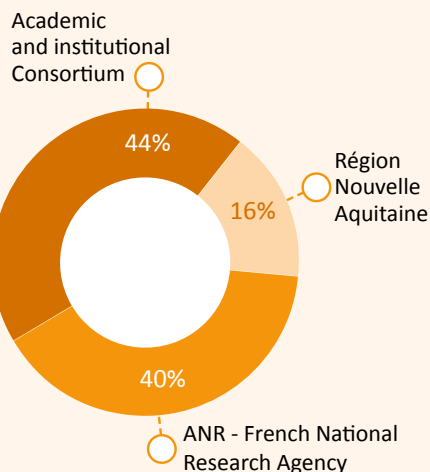




Accelerated Development of Alloy Materials for Energy Technologies



FINANCIAL CONTRIBUTION/YEAR



KEY DATES

- Chair kick-off: September 2019
- Duration: 5 years

TEAM COMPOSITION

- Permanent employees: 2
- PhD: 2
- Post doctorate: 5

LOCALISATION: Pau

- Joint research unit UPPA/CNRS - Institute of analytical sciences and physical chemistry for the environment and materials (IPREM)

@ CONTACTS

- Leader: andrew.gellman@univ-pau.fr
- Coordinator in situ: herve.martinez@univ-pau.fr



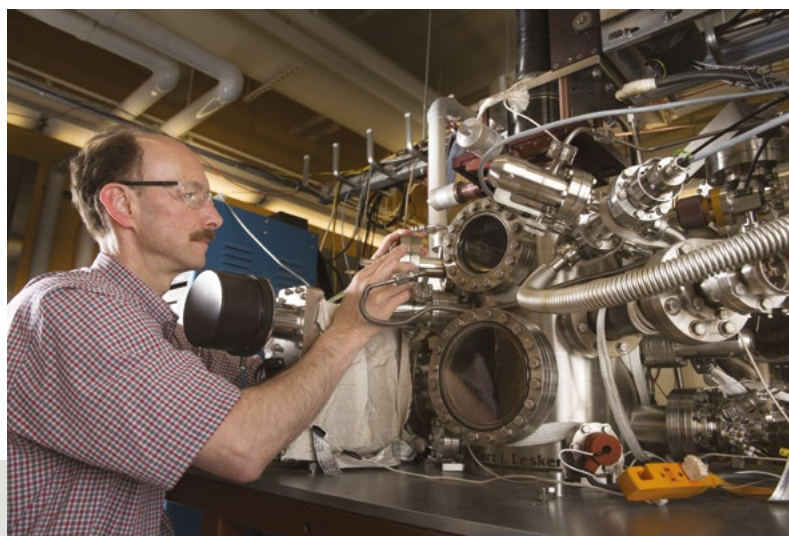
Andrew GELLMAN

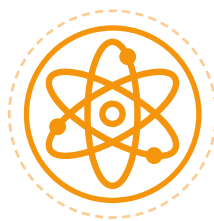
Carnegie Mellon University (USA)

My research is in the field of surface chemistry and surface science. I hold a BS in Chemistry from Caltech (1981) and a PhD in Physical Chemistry from UC Berkeley (1985). After one year as an ICI postdoctoral fellow at Cambridge University (1986), I joined the University of Illinois at Urbana-Champaign as an Assistant Professor of Chemistry. I now hold the Lord Chair of Chemical Engineering at Carnegie Mellon University and where I also serve as the co-Director of the W.E. Scott Institute for Energy Innovation.

PRESENTATION

Professor Gellman's research is in the area of surface chemistry with particular emphasis on catalytic surface chemistry, selective chemistry on chiral surfaces, tribology and high throughput study of alloy surfaces. He has developed a number of experiments and methodologies for exploring fundamental aspects of surface chemistry in each of these areas. His research is now focusing on the development and application of high throughput methods for study of alloy surface properties such as catalysis and surface processes relevant to energy technologies. His laboratory has developed tools for preparing Composition Spread Alloy Films that contain all possible compositions of binary or ternary alloys; $A_x B_y C_{1-x-y}$ with $x = 0 \rightarrow 1$, $y = 0 \rightarrow 1-x$. These are used for studying alloy properties such as catalysis, corrosion, and adsorption spanning all possible alloy compositions. In addition to enabling optimization of alloy properties, these studies provide comprehensive datasets that can serve as the basis for development of models that predict the composition dependence of these phenomena on alloys.





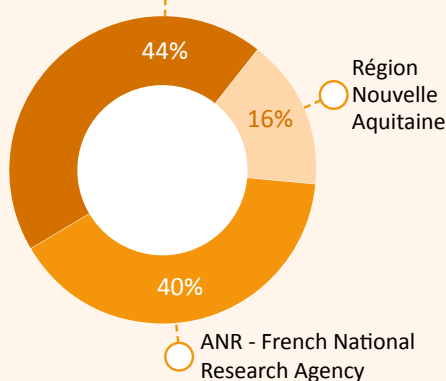
Creating Structural Diversity through BN/CC Isosterism

Developing New Energy Conversion Platforms using Boron-Nitrogen Heterocycles



FINANCIAL CONTRIBUTION/YEAR

Academic and institutional Consortium



KEY DATES

Chair kick-off : March 2019

Duration : 5 years



TEAM COMPOSITION

Permanent employees: 4

PhD: 2

Post doctorate: 5



LOCALISATION: Pau

Joint research unit UPPA/CNRS - Institute of analytical sciences and physical chemistry for the environment and materials (IPREM)



CONTACTS

Leader: shihyuan.liu@univ-pau.fr

Coordinator in situ: anna.chrostowska@univ-pau.fr



Shih-Yuan LIU
Boston College (USA)

- 1998 TU Wien (BSc)
 - 2003 MIT (PhD organic chemistry with Gregory C. Fu)
 - 2003-2006 MIT (Postdoc inorganic chemistry with Daniel G. Nocera)
 - 2006-2012 Assistant Professor, Univ. of Oregon
 - 2012-2013 Associate Professor, Univ. of Oregon
 - 2013- Full Professor, Boston College
- Expertise: Synthetic organic chemistry



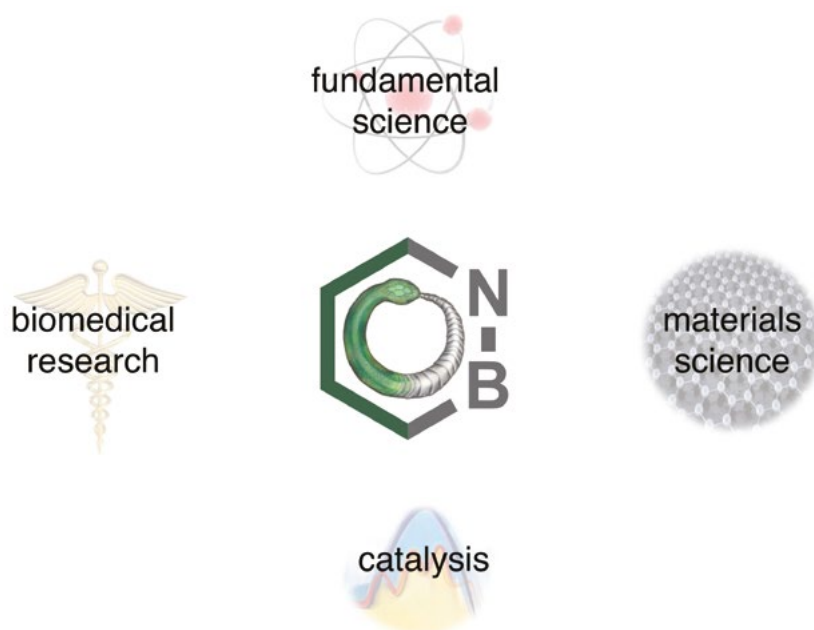
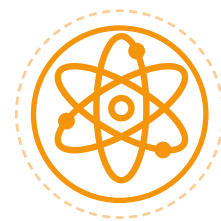
PRESENTATION

We are engaged in synthetic chemistry with emphasis on developing molecules of importance in biomedical research and materials science.

We are particularly interested in the development of boron(B)–nitrogen(N)-containing heterocycles, specifically azaborines. These are structures resulting from the replacement of two carbon atoms in benzene with a boron and a nitrogen atom. Azaborines closely match the size and shape of ordinary benzene rings, but most of their other physical, chemical, and spectroscopic properties are significantly altered.

We aim to exploit the unique properties of azaborines and investigate their potential as arene surrogates in materials and biomedical research. Our approach combines the broad utility of arenes with the unique elemental features of boron.

Areas of exploration include organic synthesis, catalysis, hydrogen storage, optoelectronic materials, and drug discovery.



✓ ACHIEVEMENT(S)

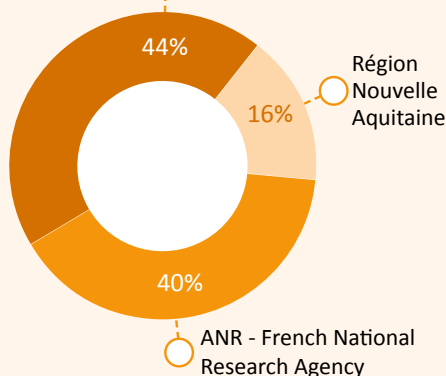
- Since the kick-off of the chair in March 2019, 1 postdoc and 2 PhD students have been recruited. The chair is progressing with regard to the synthesis of BN azulenes as well as BN cycloparaphenylenes.
- In June, as part of the monthly E2S UPPA conferences, Professor Liu gave a lecture entitled “Translating Structure to Function Using Chemical Synthesis”.
- Likewise, in July, Dr. Tom Autrey who is also involved in the chair research gave a lecture entitled: “Energy landscapes defining catalytic reaction pathways leading to energy storage in chemical bonds”



Mathematics and statistics

FINANCIAL CONTRIBUTION/YEAR

Academic and institutional Consortium



KEY DATES

Chair kick-off: January 2019

Duration: 5 years



TEAM COMPOSITION

Permanent employees: 2

PhD: 2

Post doctorate: 5



LOCALISATION: Anglet

Joint research unit UPPA/CNRS - Laboratory for mathematics and their applications in Pau (IPRA - LMAP)



CONTACTS

Leader: kerrie.mengersen@univ-pau.fr

Coordinator in situ: benoit.liquet@univ-pau.fr



Kerrie MENGENSEN
Queensland University (AU)

I am an applied statistician. I hold a Research Chair in Statistics at the Queensland University of Technology. I am an elected Fellow of the Australian Academy of Science and the Australian Academy of Social Sciences, and a Fellow of a number of professional statistical societies.



PRESENTATION

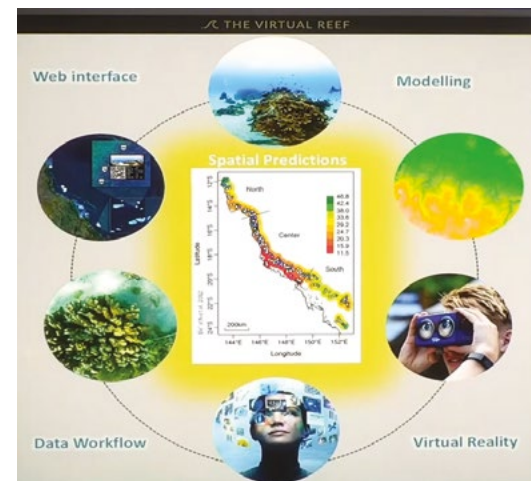
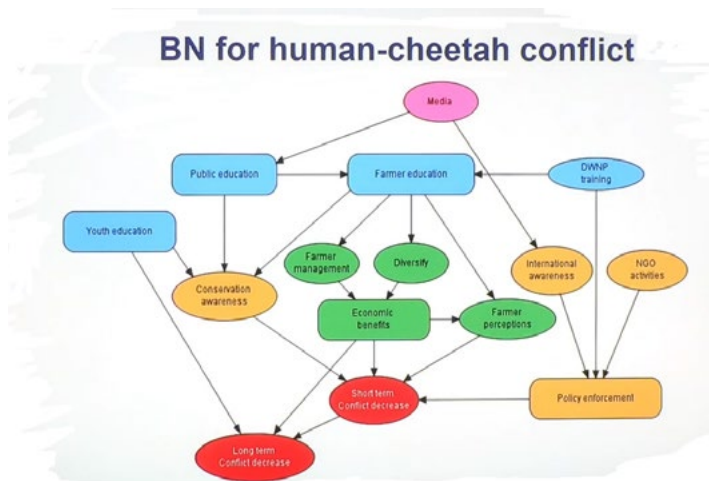
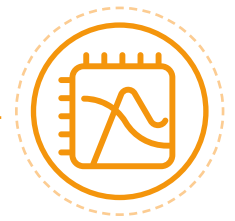
My principal field of research is Bayesian statistics. I am interested in Bayesian modelling, computation and application. Regarding modelling, I focus on representations of complex systems, such as those with latent structures (e.g., mixture models) or interacting structures (e.g., networks). Regarding computations, I am currently interested in approximate simulation methods (e.g. ABC) and methods for tackling high dimensional problems. Regarding applications, I focus mainly on substantive problems in ecology and environment, health and society.

In this research programme, I will focus on Bayesian statistical approaches to problems in ecology and the environment, such as the identification of anomalies in water quality and conservation of coral reefs. This will require the development of new Bayesian methods and efficient algorithms for highly structured big data and systems data.

“

Statistics is about taking these different kinds of data that we might have, examining those data and opening those data up to tell the stories that the data reveal.”

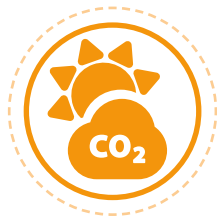




✓ ACHIEVEMENT(S)

In november, Kerrie introduced E2S UPPA's second cycle of conferences with a lecture titled "Merging Data Science and Citizen Science for Conservation of Threatened Species". During this conference, Kerrie described some of the ways in which she and her team have been using citizen science data to address conservation challenges for jaguars in the Peruvian Amazon, koalas in Australia and coral cover in the Great Barrier Reef. She discussed the statistical challenges arising from the use of such data, including adjusting for bias and combining the data with other information sources.



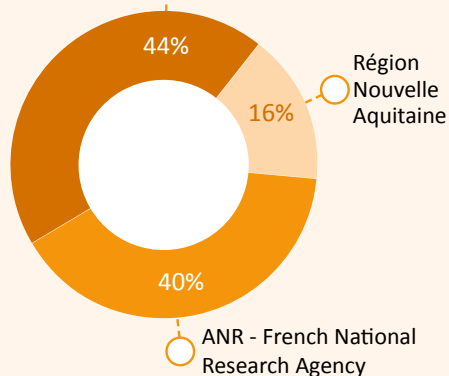


InterMat - Interface Matters in Solution Processed Inorganic



FINANCIAL CONTRIBUTION/YEAR

Academic and institutional Consortium



KEY DATES

- Chair kick-off: May 2019
- Duration: 5 years

TEAM COMPOSITION

- Permanent employees: 3
- PhD: 2
- Post doctorate: 5

LOCALISATION: Pau

- Joint research unit UPPA/CNRS - Institute of analytical sciences and physical chemistry for the environment and materials (IPREM)

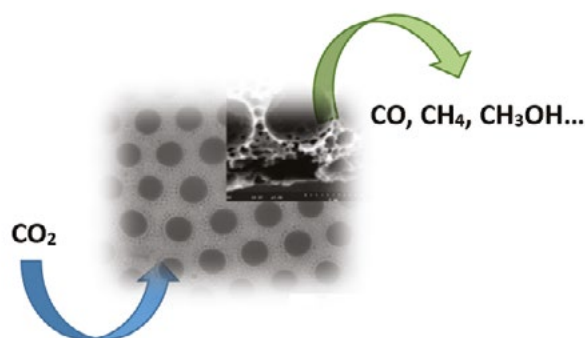
@ CONTACTS

- Leader: emilio.palomares@univ-pau.fr
- Coordinator in situ: laurent.billon@univ-pau.fr



Emilio PALOMARES
Institute of Chemical Research of Catalonia (Spain)

Dr. Emilio Palomares (Spain, 1974) is ICREA Research Professor at the Institute of Chemical Research of Catalonia (ICIQ). His research focuses on energy conversion devices ; from the synthesis of the materials to the analysis of the full device in operando conditions. He is Fellow of the Royal Society of Chemistry (UK) and has published over 250 articles.



PRESENTATION


InterMat aims to approach perovskite solar cells and novel catalysts to their use in CO₂ conversion photo-electrocatalytic systems to mimic photosynthesis. On the one hand, it will focus also on the investigation of the interface between the nanoscale inorganic semiconductor layers in these thin film solar cells to reduce non-radiate charge recombination processes and maximize the solar cell efficiency. Furthermore, it will study the photo-electrocatalytic reactions at the surface of the organic or inorganic nano/micro-structured semiconductor electrodes used in the photo-reactor for the reduction of CO₂ into solar fuels.

How materials work-function changes, the interfacial charge transfer reactions that limits the devices theoretical maximum efficiency for CO₂ conversion, the mechanism for charge accumulation and charge transport across the interface are still unresolved challenges to achieve a quantum leap in efficiency in earth abundant and novel solution process photo-electrocatalytic systems for CO₂ catalysis.



International Guest Chair with partnership

International chairs are part time visiting professor positions. Applicants should have a track record demonstrating their high-level scientific achievements and strong international visibility. The call for applicants is opened and widely publicised internationally. Laureates are appointed for five years, upon recommendation of the external scientific committee of E2S UPPA. Recipients commit themselves to spending on average two months per year at E2S UPPA. Some international guest chairs involve support from public and/or private partnerships allowing for shared funding with E2S UPPA. Two doctoral fellowships and a five-year postdoctoral fellowship are offered in order to strengthen the relationships between their group and our laboratories. Additional money is also provided for direct costs.

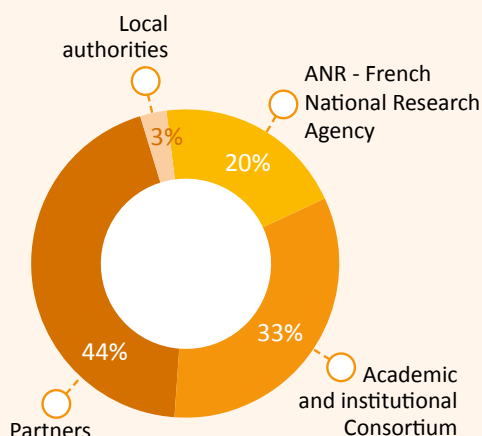




PULPA - Pulsed Power Science Technology and Applications



€ FINANCIAL CONTRIBUTION/YEAR



🤝 PARTNERS

- CEA - Commissariat à l'énergie atomique et aux énergies alternatives
- ITHPP SAS - Groupe ALCEN
- RNA - Région Nouvelle Aquitaine

📅 KEY DATES

- Chair kick-off: January 2019
- Duration: 5 years

👥 TEAM COMPOSITION

- Permanent employees: 5
- PhD: 3
- Post doctorate: 5

📍 LOCALISATION: Pau

- UPPA's research unit - Laboratory for applied sciences in mechanics and electrical engineering (IPRA - SIAME)

@ CONTACTS

- Leader: bucur.novac@univ-pau.fr
- Coordinator in situ: laurent.pecastaing@univ-pau.fr



🔍 PRESENTATION

Pulsed Power is a technology based on slowly accumulating electrostatic energy in a capacitor, provided by an initial energy source, and releasing this energy as a very fast transient and high-power voltage impulse.

The main aim of my Chair is to help a dynamic team at UPPA to perform research in two domains, both related to pulsed power applications: cancer treatment by non-invasive pulsed electric field techniques and electric-driven hard rock drilling.

Between the Plasma and Pulsed Power Group (P3G), Loughborough University (UK) and the Pulsed Power Group at UPPA, led by Professor Laurent Pecastaing, there is a long and fruitful scientific collaboration with a large number of jointly published papers in the most reputed international journals plus many common presentations at the best international conferences in our domain.

My Chair includes 5 years Post-Doctoral positions and 3 PhD students under my guidance. The team is very ambitious, and our main aim is to discover and advance the knowledge well beyond the present worldwide state-of-the-art.



Bucur NOVAC

Loughborough University (UK)

My career started in 1977 at the Institute of Atomic Physics, Bucharest, Romania where I was the Head of the Plasma Laboratory, between 1993 and 1998.

Since 1998 I have been working at Loughborough University, UK and received the title 'Professor of Pulsed Power' in 2011. I am now the Head of the Plasma and Pulsed Power Group (P3G).

The results of the work undertaken along my career have resulted in more than 200 publications and I delivered International Invited Courses in 10 countries over 3



ACHIEVEMENT(S)

- 2 PhD students and 2 post-doctoral fellows started their research work in 2019. A new PhD student is expected to start in September 2020.
- The first major results obtained by our research group should come out this year. They will be presented in international journals and at the international EAPPC-BEAMS-MG 2020 conference, a highly prestigious event that our research group is organising in Biarritz.





EAPPC BEAMS
MEGAGAUSS 2020
BIARRITZ | FRANCE

13-17 | September 2020

Biarritz Bellevue Congress Center
France

8th Euro-Asian Pulsed Power Conference
23rd High-Power Particle Beams Conference
17th Megagauss Magnetic Field Generation and Related Topics Conference

General Chair: Laurent Pecastaing
University of Pau (FR)

Technical Chair: Bucur Novac
University of Loughborough (UK)

info@eappc-beams2020.org
www.eappc-beams2020.org

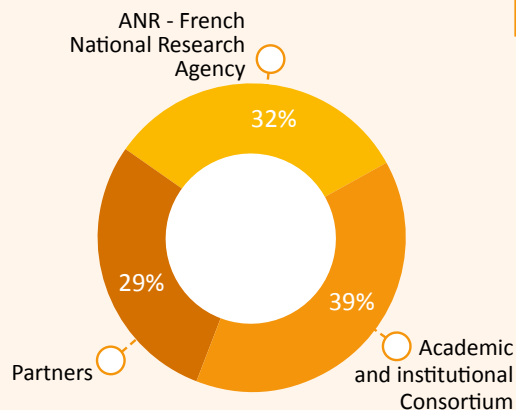





Untargeted Molecular-level Analysis of Complex Systems: An opportunity to learn from sample complexity



FINANCIAL CONTRIBUTION/YEAR



PARTNERS

- TOTAL E&P Recherche et Developpement SAS



KEY DATES

- Chair kick-off: May 2019
- Duration: 5 years



TEAM COMPOSITION

- Permanent employees: 2
- PhD: 2
- Post doctorate: 5



LOCALISATION: Pau

- Joint research unit UPPA/CNRS - Institute of analytical sciences and physical chemistry for the environment and materials (IPREM)



CONTACTS

- Leader: ryan.rodgers@univ-pau.fr
- Coordinator in situ: brice.bouysiere@univ-pau.fr



Ryan RODGERS

Florida State University (USA)

Professor Rodgers received a B.S. in chemistry from the University of Florida in 1995, and a Ph.D. in analytical chemistry from Florida State University in 1999. Following a postdoctoral appointment at Oak Ridge National Laboratory, he joined the Ion Cyclotron Resonance Program at the National High Magnetic Field Laboratory (NHMFL) as an Assistant Scholar-Scientist and a courtesy faculty member of the Department of Chemistry and Biochemistry at Florida State University. He currently is the Director of the Future Fuels Institute, FSU Distinguished Scholar, and an Associate Editor of Energy and Fuels.



PRESENTATION

Over the past two decades, high field FT-ICR mass spectrometry has forever changed the utility and expectations of complex mixture analysis by mass spectrometry. The inherent high resolving power and high mass accuracy enable direct determination of elemental compositions to tens of thousands of individual components in complex mixtures by mass measurement alone. Modern ionization methods facilitate the selective ionization of components based coarsely on chemical functionality, which combined with FT-ICR MS, reveals acidic, basic, and aromatic contributions to complex mixtures at a molecular level. In this research plan, we will continue to pioneer petrochemical and environmental applications of the technology to aide in the understanding of complex degradation / cycling processes of organic carbon in the environment and advance efforts for the judicious use of heavy petroleum fractions.



MagLab (National High MAGnetic field LABoratory) chemist Ryan Rodgers was awarded the Distinguished University Scholar Award from Florida State University in 2018.





<http://e2s-uppa.eu>