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PARISTECH – CSC PHD PROGRAM

- November 9, 2021 -

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4. Labs and PhD proposals

WEBINAR GUESTS

AgroParisTech – Pierre Larraufie, Deputy head of ABIES Doctoral School and AgroParisTech Doctoral Studies
AgroParisTech – Institute of ecology and environmental sciences of Paris (IEES)：Emmanuelle Jacquin-Joly

Arts et Métiers Sciences et Technologies – Ali Siadat, scientific advisor for China at Arts et Métiers
Arts et Métiers Sciences et Technologies – LCFC: Tudor Balan
Arts et Métiers Sciences et Technologies – LISPEN Lab. : Nathalie Klement, Olivier Thomas, Simon Benacchio
Arts et Métiers Sciences et Technologies – Laboratoire de Mécanique des Fluides de Lille: Francesco Romano
Arts et Métiers Sciences et Technologies – LEM3: Sophie Berveiller, Mohamed Jebahi
Arts et Métiers Sciences et Technologies – MSMP: Mourad Elhadrouz, Jean-Patrick Goulmy, Dorian Depriester
Arts et Métiers Sciences et Technologies – LIFSE: Mathieu Specklin, Samir Garbaya, Sofian Khelladi
Arts et Métiers Sciences et Technologies – L2EP : Nguc Ky Nguyen
Arts et Métiers Sciences et Technologies – I2M : Anita Catapano, Azita Ahmadi-Senichault, Antonio Rodriguez de Castro, Abdelaziz Omari

Chimie ParisTech – PSL – Ilaria Ciofini, VP Research
Chimie ParisTech – PSL – IRCP: Jolanta Swiatowska, Vincent Semetey

Ecole des Ponts ParisTech – Emmanuel Girard, Research deputy director
Ecole des Ponts ParisTech – Jean-Michel Pereira, Navier deputy director
Ecole des Ponts ParisTech – Philippe Coussot, Research director at Navier
Ecole des Ponts ParisTech – Auguste Gires, associate professor, HMCO

ESPCI Paris – PSL – Costantino Creton, VP Research
ESPCI Paris – PSL – C3M: Benjamin Laroche
ESPCI Paris – PSL – CBI: Corentin Tregouet
ESPCI Paris – PSL –SIMM: Jean Comtet
ESPCI Paris – PSL – Institut Langevin : Xiaoping Jia

MINES ParisTech– PSL – Julien Haccoun, deputy head of research, in charge of academic partnerships
MINES ParisTech – PSL – GEOSCIENCES - Centre de Géosciences : Emad Jahangir

Institut d'Optique Graduate School – Denis Boiron, Deputy head of Doctoral School Waves and Matter (EDOM)
Institut d'Optique Graduate School – LP2N : Philippe Lalanne, Adele Hilico

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1. PARISTECH INTRODUCTION

PARISTECH SCHOOLS

7

« Grandes Écoles »
In Engineering & Science

Paris-Saclay University
PSL University
HESAM
Paris-Est Sup

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KEY NUMBERS

12 000 students

1 500 PhD candidates

68 international agreements

56 teaching and research chairs

1 500 professors

120 partner companies

90 000 alumni

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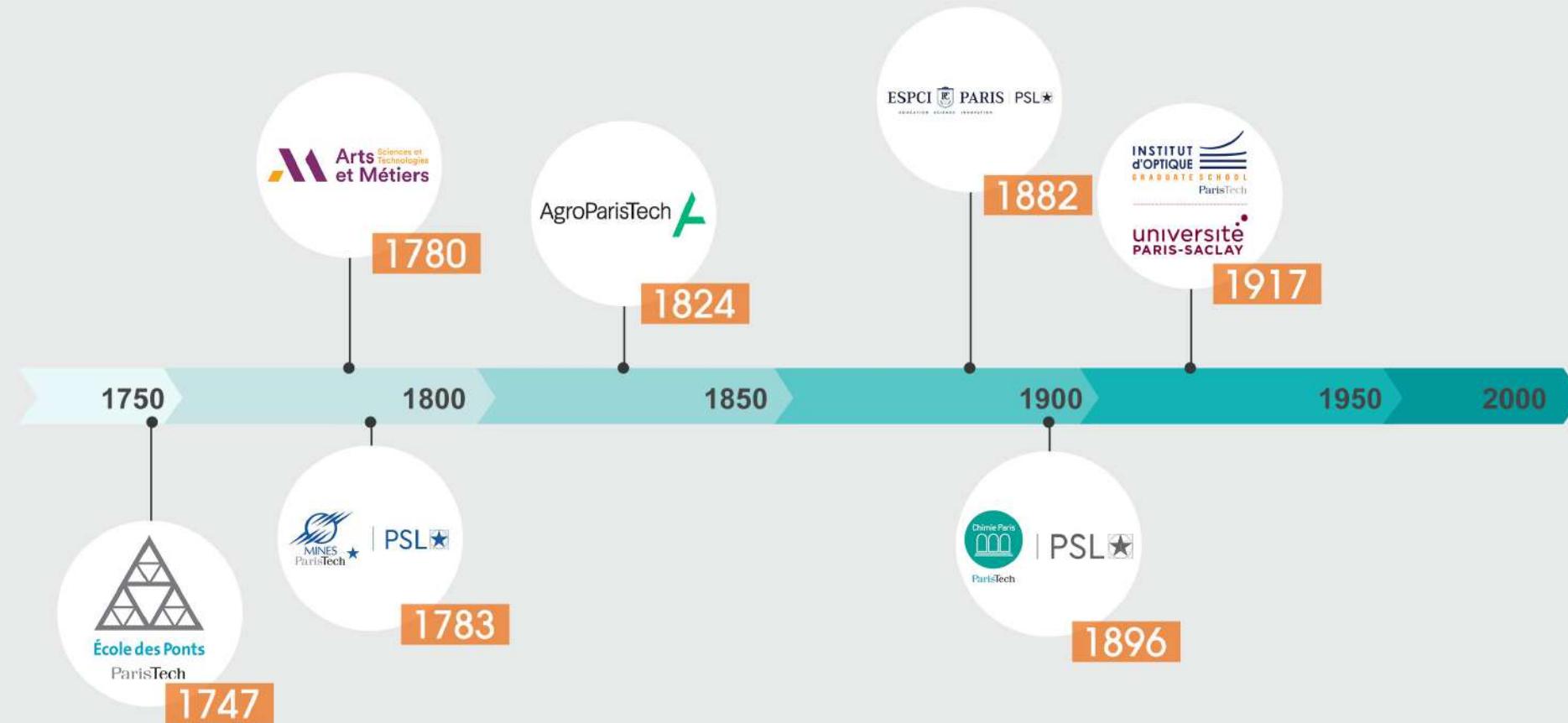
LEAVING A MARK IN HISTORY…

Émile Prisse d'Avesnes (1807-1871), archaeologist and journalist, contributed to deciphering Egyptian hieroglyphs
Arts et Métiers
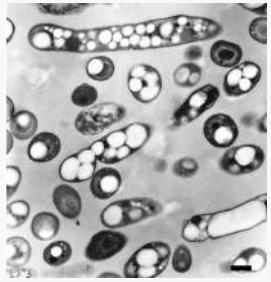
Maurice Lemoigne (1883-1952) agricultural engineer and biologist who is credited with the discovery of polyhydroxyalcanoates
AgroParisTech

Félix Trombe (1906-1985)
chemist, physicist and speleologist, he is one of the pioneers of solar energy
Chimie ParisTech - PSL

Fulgence Bienvenüe (1852-1936), chief engineer for metro in Paris
Ecole des Ponts ParisTech

Paul Langevin (1872-1946)
Physicist, inventor of the sonar
ESPCI Paris - PSL

Bernard Maitenaz (1926-) engineer, optician, inventor of progressive lenses for vision correction
Institut d'optique Graduate School

$$(1) \quad \frac{df}{dt}[x(t), y(t)]$$
$$= \frac{dx}{dt}(t) \cdot \frac{\partial f}{\partial x}[x(t), y(t)] + \frac{dy}{dt}(t) \cdot \frac{\partial f}{\partial y}[x(t), y(t)],$$

Jules-Henri Poincaré (1854-1912)
Mathematician, physicist, completed major work on infinitesimal calculus
MINES ParisTech - PSL

PERMAMENT CONNECTIONS WITH COMPANIES

PARISTECH ALUMNI - KEY PLAYERS OF THE ECONOMIC WORLD

Philippe Knoche
MINES ParisTech - PSL

Antoine Frérot
École des Ponts ParisTech

Henri Poupart-Lafarge
École des Ponts ParisTech

Christel Heydemann
École des Ponts ParisTech

Béatrice Foucher
AgroParisTech

Eric Carreel
ESPCI Paris - PSL

Nicolas Brusson
Institut d'Optique Graduate School

Patrice Caine
MINES ParisTech - PSL

Xavier Huillard
École des Ponts ParisTech

Benoît de Ruffray
École des Ponts ParisTech

Jean-Marc Chéry
Arts et Métiers

Jacques Aschenbroich
MINES ParisTech - PSL

Marion Dewagenaere
École des Ponts ParisTech

Jean-Laurent Bonnafé
MINES ParisTech - PSL

Anne Rigail
MINES ParisTech - PSL

Mostafa Terrab
École des Ponts ParisTech

Laurence Piketty
Chimie ParisTech - PSL

Jean-Philippe Puig
Chimie ParisTech - PSL

Eric Niedziela
Arts et Métiers

START-UPS, EXAMPLES

URBAN CANOPEE

Canopy solutions to cover the city's landscape with a modular, reversible, natural and light-weight vegetation mesh

Expliseat
LIGHT AND DURABLE AIRCRAFT SOLUTIONS

Ultra-light (4kg) Titanium Seats for Aircrafts

Ynsect

Breeding and processing insects to contribute to the major challenges of our time: feeding the world's population, preserving resources and biodiversity, and fighting global warming

AZA
Electrically Rechargeable Zinc-Air Batteries

Zinc-Air batteries to replace lead batteries, but also the famous lithium batteries. They are inexpensive and safe, because they work in water.
Aza Battery is developing new systems by improving all components (bi-functional air electrodes, separating membrane and zinc electrode)

HOLOGIC® SUPERSONIC™ imagine

Ultrasound medical imaging

An innovative medical technology company primarily focused on improving women's health and well-being through early detection and treatment

WHY CHOOSE FRANCE?

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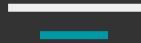
EXCELLENCE IN S&T AND ECONOMICS

6th economic power in the world
- **International company leaders** in their sector (materials, building, cosmetics, energy, transport…)
- Paris area: a dynamic region (a lot of companies, high employability rate, numerous R&D centers)

Excellence of the Higher Education system
- 5th destination in the world for international students
- Scholarships and support for international mobility
- A lot of international academic partners
- Tuition fees lower than most of the Western countries

A S&T leader worldwide
- The country of mathematicians (Viète, Laplace, Cauchy, Poincaré, Louis Bachelier…)
- Excellence in a lot of domains, e.g. chemistry, civil engineering, physics (Marie & Pierre Curie, Ampère, Laplace, Freyssinet, Coriolis, Fourier…)
- Nobel prizes and Fields medals
- World famous research organisations (CNRS, INRAE, INSERM, CEA…)

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A COUNTRY OF CULTURE

Tradition / Art & History / Quality of Life
- Arts (museums, movies, literature, philosophy…)
- Romantism, impressionism, surrealism…
- Food

Values
- Freedom, egality, brotherhood
- Inclusion
- Cosmopolitanism
- Critical thinking, strong attachment to sciences and innovation

A key role in ecological transition and climate change

French language
- Official language of more than 300 million people (5th in the world)
- 5th most important language for business in the world after English and Mandarin Chinese

What international students are saying
- *9 out of 10 international students recommend France as first study destination*
- *93 % believe that studying in France has been a self-enrichment*
- *86 % believe that studying in France have highlighted their university curriculum*

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2. PARISTECH – CSC PHD PROGRAM

APPLICANT'S PROFILE

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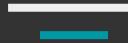
PREREQUISITES

Find all relevant information on:

Applicants must be citizens of the People's Republic of China at the time of application.
Applicants should not hold a foreign permanent residence permit.
Applicants should be at least 18 years old at the time of application.

STUDYING IN CHINA
- At final year of Master degree
- In the 1st PhD year, recommended by your home university (for co-supervised PhD)

STUDYING IN FRANCE (OR IN ONE OF THE 41 PARTNER COUNTRIES OF THE CSC)
- Second/Last year Master's (M2) students or students graduated within less than a year at the time of application for the CSC scholarship.

- *Applicants who have studied for a "Diplôme d'ingénieur" in France, and especially those who have received funding from the CSC - ParisTech "9+9" Program project are also encouraged to apply to this PhD program.*

WORKING
You are **a master holder** and you work in a company that agrees with your PhD project

PREREQUISITES: EXCELLENCE, FOR A HIGHLY-SELECTIVE COMPETITION

- You have **excellent academic records, especially in the relevant discipline.**

- You should have **good command of written and spoken English.**

- **You should have a coherent personal and professional plan.**

- You are willing to learn minimal French for basic communication.

Tips

- *Learn as much as you can about the labs, the PhD advisors, their past and present work.*
- *Carefully select PhD proposals that are relevant with your personal profile.*
- *Then build a coherent, clear professional plan around the information you gather.*

THE CSC SCHOLARSHIP – FUNDING SCHEME

- 1350€ / month (for the duration specified on your admission letter, starting when you arrive in France) + one-time round-trip international travel expenses by the most economical route

- Duration :
  - 36-48 months for full PhD
  - 6-24 months for co-supervised PhD

- You are committed to go back to China at then end of your PhD (exceptions to be found on the CSC website).

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Calendar & Steps
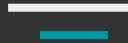
WHERE TO FIND RELEVANT INFORMATION?

PARISTECH WEBSITES

https://www.paristech.fr/en/homepage
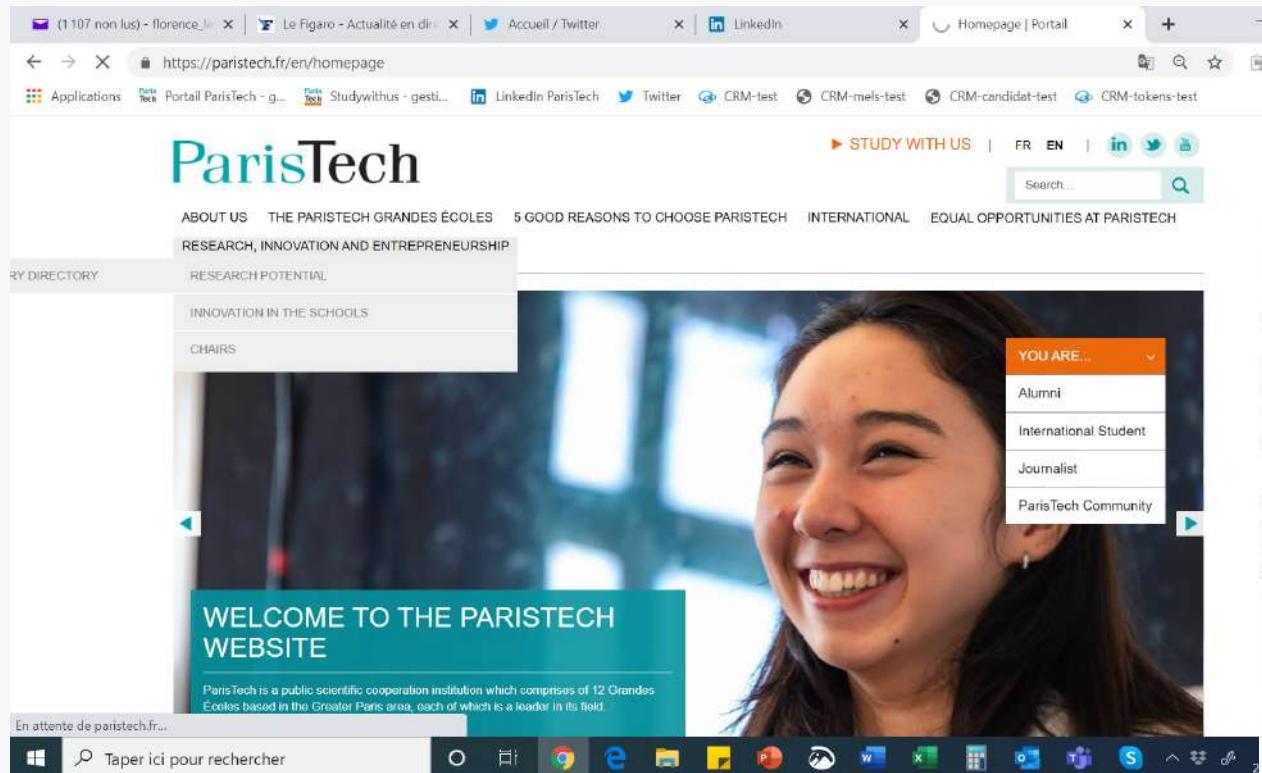
To learn more about the ParisTech – CSC PhD program, about the ParisTech labs, etc.

You can check them on the excel table, or download them all here:
https://www.paristech.fr/en/international/china/paristech-csc/how-apply

7 SCHOOLS

110 PhD PROPOSALS

in

12 FIELDS OF ENGINEERING

LABS LOCATED IN **+20** CITIES IN FRANCE

1/ Eligibility

2/ Funding scheme

3/ Calendar for the 2021/2022 campaign

4/ List of PhD proposals

You can download here the 2022 PhD proposals booklet and the Excel table, with subject listed according to the Research Fields covered by ParisTech.

Candidates can either apply to:

- specific PhD research proposals (up to 3),
- and / or an entire research field: in this case we strongly encourage you to check the database of ParisTech publications to identify potential PhD supervisors and mention them in your application.

Please note that you are encouraged to contact supervisors during the application process, either:

- to make sure the research proposal corresponds to your project,
- or in the case you found a lab or supervisor you were interested in pursuing a PhD with, to define a thesis subject with them.

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WHERE TO GET RELEVANT INFORMATION?

PARISTECH SOCIAL MEDIA ACCOUNTS
For videos, information on research and innovation in ParisTech schools...

GLOBAL ACCOUNTS

LinkedIn

Twitter

Facebook

YouTube

CHINESE ACCOUNTS

LinkedIn

Wechat

Twitter

Weibo

Bilibili

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INTERNATIONAL ADMISSION PROCESS

18 October 2021: Publication of the PhD proposals

October 18, 2021 – December 12, 2021 (23.59 Paris Time) : Application

December 24, 2021: Invitation to the interview

January 10 – 21, 2022: Interview with ParisTech

Late January – February 2022: Interview with the PhD supervisor(s)

Conditional Admission letter

March 2022: CSC scholarship application

APPLICATION

Step 1- Publication of the PhD proposals on ParisTech website on October 18, 2021

Step 2- Online application from October 18 to December 12 (23:59 Paris Time), 2021

DOCUMENTS TO BE UPLOADED (*ARE MANDATORY)	
2 recommendation forms*	Student ranking certificates (at bachelor and master level)*
Academic transcripts (at bachelor and master level)*	English certificate (IELTS, TOEFL, CET-6/4, etc.)*
A personal statement including motivation and rough research plan (1-2 pages)*	A scan of your passport or resident ID card*
An ID photo*	An English summary of your master thesis
French certificate	Any further document proving your academic or scientific achievement / excellence (ex. university prize, published work, previously awarded scholarship)

Step 4- Selection based on the application files and if selected, invitation to an interview (December 24, 2021)

Step 5- Online interviews from January 10 to 21, 2022

Step 6- Interview with the potential PhD supervisor(s) from end of January to end of February 2022

Step 7- Conditional admission letter provided to the selected applicants by the PhD supervisors (conditions: obtention of master degree and CSC scholarship) (before March 2022)

Step 8- Application for the CSC scholarship by the student (March 2022)

Step 9- Results of the CSC process (May-June 2022)

ParisTech China will ensure a follow-up process of the CSC scholars til the arrival in France, in relation with the ParisTech schools.

HOW WILL YOUR APPLICATION BE EVALUATED?

In your application file
- **The file you submit should be complete**
- Excellence of academic transcripts
- Ranking: personal ranking and ranking of your university at national and international level
- Referrals

During the interview
- Your capacity to communicate in English, and even in French if you are able to
- Your capacity to present and explain clearly your personal and professional project

During the interview with the potential PhD supervisor
- The relevance of your profile with the lab's requirements and the thesis
- Your scientific level in relevant fields

The doctoral training program total cost in France is between 100k & 150k Euros per year.

PhD candidates are only asked for tuition fees:

Admitted students may benefit from a partial or full tuition fee waiver for the duration of their studies at their host ParisTech Grande École.

ParisTech Schools	Tuition fees
AgroParisTech	380€ + 92€ CVEC* each year
Arts et Métiers Sciences et Technologies	
Chimie ParisTech - PSL	
Ecole des Ponts ParisTech	
ESPCI Paris - PSL	
Institut d'Optique Graduate School	
MINES ParisTech - PSL	

*CVEC : access to health and social services, sport facilities etc. in the schools.
Learn more about it: https://www.campusfrance.org/en/10-things-you-need-to-know-about-the-student-and-campus-life-contribution-cvec

RESULTS

By the end of May 2022 – June 2022, the CSC will announce the list of successful candidates.

*Each year, over 100 candidates apply to this program, half get a proposal
from a ParisTech school lab.
In 2020, 33 scholarships were granted by the CSC.*

Successful applicants will then receive their official admission letters, and be informed by the CSC about all the administrative procedures to follow before departure for France.

Once all administrative procedures over, and their visas obtained, PhD candidates will be expected to arrive in France in September – October 2022.

STUDYING AT PARISTECH

- Accommodations
  - Help to find accommodation
  - Possibility of accommodation allowance
  - Average living costs in Paris: ~ 800 € /month

- Assistance with visa procedure

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3. Research in paristech's schools

EXCELLENCE IN RESEARCH
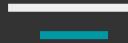
A LONG TRADITION OF SCIENTIFIC EXCELLENCE

NOBEL PRIZES

Pierre & Marie Curie
Physics

Henri Becquerel
Physics

Frédéric & Irène Joliot-Curie
Physics

Pierre-Gilles de Gennes
Physics

Alain Aspect
Physics (Wolf Prize)

1903

1935

1991

2010

1900   1940   1980   2000

1911

1906

Marie Curie
Chemistry

Henri Moissan
Chemistry

1988

1992

Maurice Allais
Economics

Georges Charpak
Physics

2014

Jean Tirole
Economics

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RANKINGS

are ranked on their own

Shanghai Ranking (ARWU) 2021
University Paris-Saclay: **13**th (1st 🇫🇷)   University PSL: **38**th (2nd 🇫🇷)

THE 2022
PSL: 40th
University UPSaclay: 117th
Ecole des Ponts
ParisTech: 251–300

QS 2022
PSL: 44th
University UPSaclay: 86th
Ecole des Ponts ParisTech: 245th

Shanghai Ranking (ARWU) 2021 – by subject

Mathematics
#1 UPSaclay
#13 PSL

Agricultural Sc.
#12 UPSaclay

Physics
#9 UPSaclay
#10 PSL

Biotechnology
#30 UPSaclay
#51-75 PSL

Economics
#51-75 PSL
#101-150 UPSaclay
#301-400 Ponts PT

Mechanical Eng.
#51-75 PSL
#101-150 A&M S&T

RANKINGS

From 2020, in the international rankings

are ranked on their own

Shanghai Ranking (ARWU) 2021
University Paris-Saclay: 13th (1st 🇫🇷)   **University PSL: 38th** (2nd 🇫🇷)

THE 2022
PSL: 40th
University UPSaclay: 117th
Ecole des Ponts ParisTech: 251–300

QS 2022
PSL: 44th
University UPSaclay: 86th
Ecole des Ponts ParisTech: 245th

Shanghai Ranking (ARWU) 2021 – by subject

Physics
#9 UPSaclay
#10 PSL

Mathematics
#1 UPSaclay
#13 PSL

Chemistry
#49 UPSaclay
#101-150 PSL

Earth sciences
50 PSL
#51-75 UPSaclay
#201-300 Ecole des Ponts PT

Atmospheric science
#76-100 Ecole des Ponts PT

Chemical Eng.
#201-300 PSL
#301-400 UPSaclay

Civil Eng.
#201-300 Ecole des Ponts PT

Environmental Sc. & Eng.
#151-200 UPSaclay
#301-400 Ecole des Ponts PT

Ecology
#8 PSL
#101-500 UPSaclay

Materials Sc. & Eng.
#101-150 PSL

Nanoscience & Nanotechnology
#101-150 UPSaclay
#151-200 PSL

Energy Sc & Eng
#201-300 PSL

Mechanical Eng.
#51-75 PSL
#101-150 A&M S&T

Electrical and Electronic eng.
51-75 UPSaclay

Water resources
#101-150 UPSaclay
#151-200 PSL

Automation & Control
#151-200 A&M S&T
#101-150 PSL

Metallurgical Eng.
#39 PSL
#101-150 A&M S&T

Medical Technology
#101-150 PSL

Food S&T
#76-100 UPSaclay

Biotechnology
#30 UPSaclay
51-75 PSL

Remote sensing
#76-100 UPSaclay

Economics
#51-75 PSL
#101-150 UPSaclay
#301-400 Ponts PT

Agricultural Sc.
#12 UPSaclay

Biological sciences
#76-100 UPSaclay
#101-150 PSL

Human Biological Sciences
#76-100 UPSaclay

Veterinary Sciences
#76-100 UPSaclay

Q&A
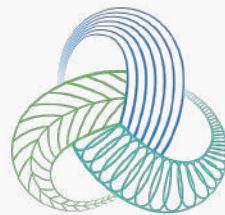
Q : Would there be a required delay of going to France due to the pandemic?
A : *All Chinese students and PhD candidates are allowed to come in France.*

Q : do we have to find the house to rent several months earlier online?
A : *you have time to search an accommodation . It could be started in May or during the summer. The scholarship is sufficient to live in France*

Q : Is it possible to have some economic supports from supervisor in case 1350 euros isn't enough ?
A : *It is not available in all labs. Some laboratories will provide additional funding. Once you have selected a research subject this is something to ask to your potential advisor.*

Q : I am a third-year PhD student, can I apply this program for co-supervised?
A : *You have to discuss it with the PhD supervisor and the lab you are interested in*

Q : I graduated on 2020, could I apply for it.
A : *Yes*

Q : Can other proposals that are not in the list but discussed with professors of ParisTech schools be accepted in this program or CSC? Can other proposals that are not in the list but discussed with professors of ParisTech school be accepted in this program or CSC?
A : *Yes,they can. You have to discuss with the advisors. It is possible to join the program with other proposals arranged with a ParisTech professor*

Q&A 2/2

Q : Is there only one quota for a Phd proposal?
A : *Everyone can apply for each topic, but the PhD supervisor will deliver only one admission letter for one candidate for each topic*

Q : I can not have a ranking, can I just show my academic records instead of the ranking?
A : *You need to give your records and you upload a file where you explain why you don't have any ranking*

Q : If I apply this ParisTech program, can I apply at the same time CSC individually for another institute not including in 7 ParisTech's schools?
A : *No, for the CSC march session you can only apply for one scholarship. You can perhaps try for another CSC session.*

Q : I was wondering what's the difference between this program and regular CSC application?
A : *This program is a partnership with CSC. If your application is submitted to CSC in the frame of this program, you have more chance to get a scholarship than as an individual applicant*

Q : May I ask for question about recommendation when we apply? Is it from the present PhD supervisor?
A : *You can choose the 2 recommendations you want. But if you are still a PhD student applying for cosupervision, it would be great to have a recommendation from your PhD supervisor in China*

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RESEARCH DOMAINS

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RESEARCH DOMAINS

Chemistry, physico-chemistry, mechanical engineering

Design, industrialization

Economics, management and social sciences

Energy, process

Environmental S&T, sustainable development, geosciences

Information and communication S&T

Life and health S&T

Life science and engineering for agriculture, food and environment

Mathematics and applications

Material sciences, mechanics and fluids

Physics, optics

Urban planning, transport

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PARISTECH SCHOOLS' LABS

Learn more about the labs in each school:

CHEMISTRY, PHYSICO-CHEMISTRY, MECHANICAL ENGINEERING

AGROPARISTECH

SayFood (Paris-Saclay Food and Bioproduct Engineering)

ÉcoSys

CHIMIE PARISTECH - PSL

i-CLeHS

IR CP | Institut de Recherche de Chimie Paris

ESPCI PARIS - PSL

UMR 7083
river

CBI

Institute of Porous Materials (IMAP)

Sciences et Ingénierie de la Matière Molle

SIMM

Chimie Moléculaire, Macromoléculaire, Matériaux

Physique et Mécanique des Milieux Hétérogènes UMR 7636

ARTS ET MÉTIERS

I2M BORDEAUX | INSTITUT DE MÉCANIQUE ET D'INGÉNIERIE

MSMP Mechanics, Surfaces and Materials Processing

AM² Transatlantic Partnership FOR INDUSTRY OF THE FUTURE

ECOLE DES PONTS PARISTECH

beesu
laboratoire eau environnement systemes urbains

*

Environmental chemistry

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ECONOMICS, MANAGEMENT AND SOCIAL SCIENCES

AgroParisTech

Sciences pour l'action et le développement - Activités, produits, territoires (SAD-APT)

Laboratoire d'économie forestière

Economie publique (ECOPUB)

Ecole des Ponts ParisTech

Paris Jourdan Sciences économiques (PjSE)

MINES ParisTech – PSL

Centre for industrial economics (CERNA)

ENERGY, PROCESS

AGROPARISTECH

SayFood (Paris-Saclay Food and Bioproduct Engineering)

ESPCI PARIS

CHIMIE PARISTECH - PSL

ARTS ET MÉTIERS

MINES PARISTECH - PSL

Centre efficacité énergétique des systèmes (CES)

Centre of Thermodynamics of Processes (CTP)

Centre Observation, Impacts, Energy (OIE)

Centre for processes, renewable energies and energy systems (PERSEE)

ENVIRONMENTAL S&T, SUSTAINABLE DEVELOPMENT, GEOSCIENCES

AGROPARISTECH

Agronomy

Sciences pour l'action et le développement – Activités, produits, territoires (SAD-APT)

ESPCI PARIS – PSL

Physique et Mécanique
des Milieux Hétérogènes
UMR 7636

ARTS ET MÉTIERS

ECOLE DES PONTS PARISTECH

MINES PARISTECH - PSL

Centre de Géosciences (GEOSCIENCES)

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INFORMATION AND COMMUNICATION S&T

Arts et Métiers

MINES ParisTech – PSL

Centre for Mathematical Morphology (CMM)

Centre de recherche en informatique (CRI)

Institut d'Optique

Ecole des Ponts ParisTech

LIFE AND HEALTH S&T

AgroParisTech

SayFood (Paris-Saclay Food and Bioproduct Engineering)

MINES ParisTech – PSL

CBIO – Centre for Computational Biology

Chimie ParisTech - PSL

i-CLeHS

Arts et Métiers

INSTITUT de BIOMÉCANIQUE HUMAINE GEORGES CHARPAK

Ingénierie des Fluides Systèmes Énergétiques

ESPCI Paris – PSL

Institut **Langevin**
ONDES ET IMAGES

Plasticité du Cerveau

Physics for Medicine
PARIS

Ecole des Ponts ParisTech

laboratoire eau environnement systemes urbains

*

Microbiology, Ecotoxicology
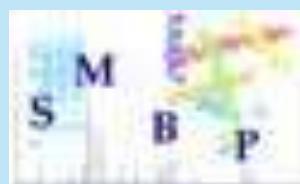
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ECOLE DES PONTS PARISTECH

 *

Microbiology, ecotoxicolgy, hydrobiology, soil science

AGROPARISTECH

Agronomy

Sciences pour l'action et le développement - Activités, produits, territoires (SAD-APT)

SayFood (Paris-Saclay Food and Bioproduct Engineering)

Laboratoire d'économie forestière

Economie publique (ECOPUB)
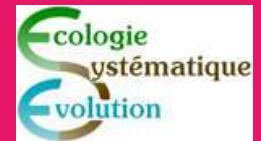
Laboratoire de Physiologie de la Nutrition et du Comportement Alimentaire

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MATERIAL SCIENCES, MECHANICS AND FLUIDS

MATHEMATICS AND APPLICATIONS

AGROPARISTECH

MINES PARISTECH – PSL

Centre Automatique et systèmes (CAS)

**Centre for Mathematical Morphology (CMM)**

ESPCI PARIS – PSL

ECOLE DES PONTS PARISTECH

Centre d'enseignement et de recherche en Mathématiques et calcul scientifique (CERMICS)

PHYSICS, OPTICS

RESEARCH AT AGROPARISTECH

PIERRE LARRAUFIE

ParisTech
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Research domains at AgroParisTech for this ParisTech – CSC program:

Agricultural Production and Forestry

Biotechnologies, green chemistry and process engineering : ABI
Forest, Trees and forest ecosystems: SILVA, EcoFoG
Animal nutrition, behavior, modelling: MoSAR
Risk management: BIOGER
Insect Chemical Ecology: IEES

Food and non-Food Transformations

Genetics: GABI, GQE
Statistics and genomics: MIA-Paris
Food microbiology: MICALIS
Nutrition: PNCA
Process engineering of agricultural, food and biological products: SayFood (Paris-Saclay)

Sustainable Management of Natural Resources and Environment

Ecology: ESE, Agronomy
Ecotoxicology: EcoSys
Water : G-EAU
Economics and public policies : BETA, CIRED, Economie publique
Mathematics & ICT, modelling, remote sensing: MIA-Paris, PRODIG, TETIS

Human Health

Food microbiology towards health: MICALIS
Process engineering of agricultural, food and biological products: SayFood (Paris-Saclay)

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RESEARCH INFRASTRUCTURES

Experimental farm, Grignon

Experimental pilot plant, Massy

Urban agriculture, Paris

STAR RESEARCHERS AT AGROPARISTECH

CLAIRE CHENU, INRA LIFETIME ACHIEVEMENT AWARD 2019
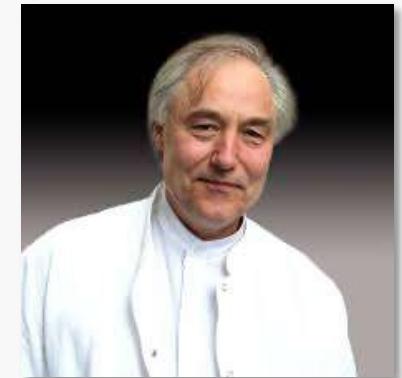
HERVÉ THIS, CREATOR OF MOLECULAR GASTRONOMY

FLORENT ALLAIS, FELLOW OF THE ROYAL SOCIETY OF CHEMISTRY

KEY FACTS / FIGURES

250 teacher-researchers and other researchers
350 PhD candidates including 31 % of international PhD candidates

Prestigious partnerships with
- Université Paris-Saclay ; Université de Reims Champagne-Ardenne ; Université de Lorraine, INRAE,...
- WUR, University of Florida, Aarhus University, University of Berkeley,...

Number of publications : 300 per year

15 patents

PhD prizes and awards (Chancellerie de Paris, Agriculture Academy, oral communications, My thesis in 180s...)

ARTS ET MÉTIERS
IN FIGURES

11
SITES
all around France dedicated to research and education

220
PHD STUDENTS
registered in our doctoral school focused on engineering

1
BACHELOR IN TECHNOLOGY

6000
STUDENTS
all programs combined

15
LABORATORIES
and research teams

11
ENGINEERING PROGRAMS

1100
STAFF
teaching, research, technical & administrative

7 MILLION €
revenue in
CONTINOUS EDUCATION

+20
MASTER OF SCIENCE

15 MILLION €
revenue generated by contracts with industry

2000
STUDENTS
in continuous education programs

17
SPECIALISED MASTERS ©

ARTS ET MÉTIERS
A UNIQUE NETWORK

LILLE

METZ

PARIS

CHÂLONS-EN-CHAMPAGNE

LAVAL

ANGERS

CHALONS-SUR SAÔNE

CLUNY

CHAMBÉRY

BORDEAUX-TALENCE

AIX-EN-PROVENCE

8 Campus dedicated to education and research

3 Institutes dedicated to research

Research domains at Arts et Métiers Institute of Technology:

Mobility

DynFluid (Paris) - aerodynamics, aeroacoustics; transition, instability and control
Institut de recherche de l'Ecole navale (Brest) - maritime transport, hydrodynamics
LEM3 (Metz): materials sciences for transport, civil engineering, energy…

Energy

L2EP (Lille) - electrical energy control, networks, power electronics
LAMPA (Angers, Laval) - advanced manufacturing processes, durability of materials and structures, VR, AR
LIFSE (Paris): renewable energy, sustainable mobility, aeronautics, space, processes, health

Health tech

Institut de biomécanique humaine Georges Charpak (Paris) - neuro-musculoskeletal modeling, sport, disability

Construction

I2M (Bordeaux) - solid mechanics, fluid mechanics, civil engineering, materials, processes, life cycle
LABOMAP (Cluny) - wood material and machining, materials and surface engineering
LMFL (Lille): fluid mechanics, mechanical reliability of materials and structures, civil engineering

Manufacturing

LCFC (Metz) – design, manufacturing, control
LCPI (Paris, Chambéry) – prototyping by virtual reality, creativity, usage analysis, eco-design
LISPEN (Lille, Chalon, Aix-en-Provence): system engineering, modeling, Human-Machine Interaction
MSMP (Lille, Chalon, Aix-en-Provence): mechanics, surfaces and materials processing
PIMM (Paris): material mechanics, polymers, numerical simulation

RESEARCH INFRASTRUCTURES

VULCAIN platform, LCFC, Metz

Virtual reality, Angers

Gait analysis, Paris

Drop tower

LIFSE, Paris

Multiaxial fatigue testing machine

Key facts / figures

380 teacher-researchers
220 PhD candidates

532 publications in 2019 including
187 international co-publications

17 patents

6 Research Chairs

Prestigious partnerships and with:

Valeo

MANN+HUMMEL

thyssenkrupp

ecosystem

esi

KIT
Karlsruher Institut für Technologie

TEES
Texas A&M Engineering
Experiment Station

Capgemini

COvea

SOCIETE GENERALE

PROTEOR

INSTITUT DE FRANCE
FONDATION YVES COTREL
POUR LA RECHERCHE EN PATHOLOGIE RACHIDIENNE

17 current EU H2020 projects including
1 MSCA ITN (European Training
Network) and 1 MSCA RISE
1 CNRS silver medal

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RESEARCH AT
CHIMIE PARISTECH - PSL

ILARIA CIOFINI

ParisTech

Research domains at Chimie ParisTech – PSL:

I-CLeHS

The I-CLeHS laboratory, composed of 4 research teams, focuses on Chemistry for Health and Life Sciences with research spanning from theoretical and physical chemistry to organic and bio-inorganic chemistry

**IPVF**

IPVF focuses on energy production (photovoltaics)

IRCP

The 8 teams of the IRCP laboratory cover a wide variety of domains of chemistry going from material science to energy production and storage.

RESEARCH INFRASTRUCTURES IN PARIS CITY CENTER

New Aglae (Louvre)

NMR/Mass/HPC facilities

Characterization (spectroscopy, microscopy)
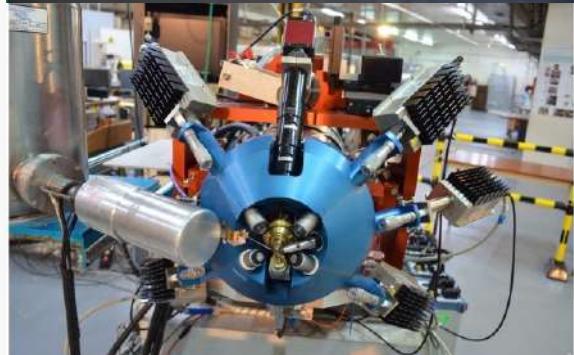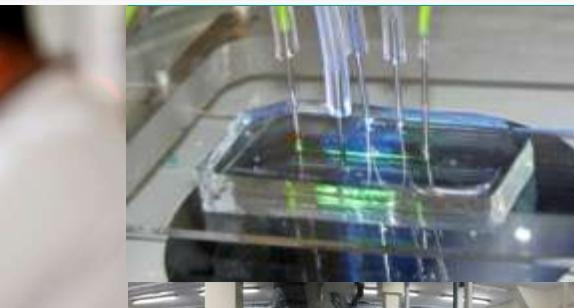
Chemistry

Optics

KEY FACTS / FIGURES

140 researchers & teacher-researchers
100 PhD candidates 50 % of international PhD candidates

300 publication a year
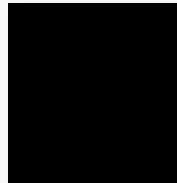
7 patents a year

Industrial Chairs
Prestigious partnerships with academic laboratories & industrial partners
Co-directed thesis with international partners (Italy, Mexico, South Africa…)

ecosystem   L'ORÉAL

SAINT-GOBAIN   pcas   THALES

orano   SEQENS   NOpTRACK   Deasyl   WAB

SANOFI   XORGAPHARM Active for your synthesis

and many others…

5 ERC (1 Starting, 2 Consolidator, 2 Advanced)
2 ITN (European Training Networks)
1 IUF (Senior)
Several international prices (France-Berkeley Funds Award, Swiss National Science Foundation ….)

RESEARCH AT
ECOLE DES PONTS PARISTECH

EMMANUEL GIRARD

ParisTech

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Research domains at Ecole des Ponts ParisTech

Industry of the future

NAVIER – ecomaterials, digital manufacturing, innovative structures, geomechanics

CERMICS – modelisation of uncertainty, digital simulation, systems optimisation

LIGM – data processing, 3D vision, big data

City and mobility systems

LVMT – sustainable mobility, territorial dynamics

LEESU – urban waters, alternative resources

CEREA – atmospheric environment, air quality, renewable energy

Management of risks, resources and milieus

HM&Co – hydro-meteorological risks, resilient cities

LMD – physics of atmosphere, climate

LHSV – renewable energy, natural risks

Economy, practices and society

LATTS – cities of future, infrastructures, policies

PjSE – public policies, environmental economy, markets and governance

CIRED – sustainable development, climate change

Fresnel

Build'In

X- band radar

Platform TARANIS

Blue-Green Wave

Multi-Hydro, RadX@HMo

EDF'lab Chatou

Ecole des Ponts
ParisTech

465 researchers / teacher-researchers
540 PhD and post doctoral students including
46 % of international doctoral students

51% of research sponsored by industry

RENAULT Passion for life   SAINT-GOBAIN   VINCI   eDF

968 international publications in 2020
including 47% international co-publications

SNCF   VEOLIA ENVIRONNEMENT   SOCIETE GENERALE

AIRFRANCE KLM   TOTAL   meridiam

… and much more

10 M€ contracts with companies

3 ERC, a lot of PhD prizes, 1 For Women in science L'Oréal-UNESCO Young researcher etc.

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RESEARCH AT ESPCI PARIS - PSL

COSTANTINO CRETON

Research @ESPCI Paris

20播放 · 0弹幕　2020-10-30 17:56:29

Costantino CRETON
Vice-President of Research at ESPCI Paris - PSL

1 人正在看，0 条弹幕　　发个友善的弹幕见证当下　　弹幕礼仪 >　　发送

Find the video on ParisTech China Bilibili account!

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Research domains at ESPCI Paris – PSL:

Biology

Brain Plasticity Lab – neurosciences + proteomics
Physics for Medicine – wave physics for medicine

Chemistry

Chemistry of Molecules and Materials – chemistry of molecules and materials
Soft Matter Science and Engineering, Institute of Porous Materials (IPM) – Soft Matter, Materials Science & Complex Fluids
CBI – microfluidics for physical chemistry and pharmaceutics

Physics

Institut Langevin, Physics for Medicine – wave physics and applications
Physics & Materials Lab – solid state physics, nanosciences
PMMH – hydrodynamics and solid mechanics
Gulliver – Soft Matter Physics

ESPCI PARIS | PSL ★

RESEARCH INFRASTRUCTURES

SOME KEY RESEARCHERS
ESPCI PARIS - PSL
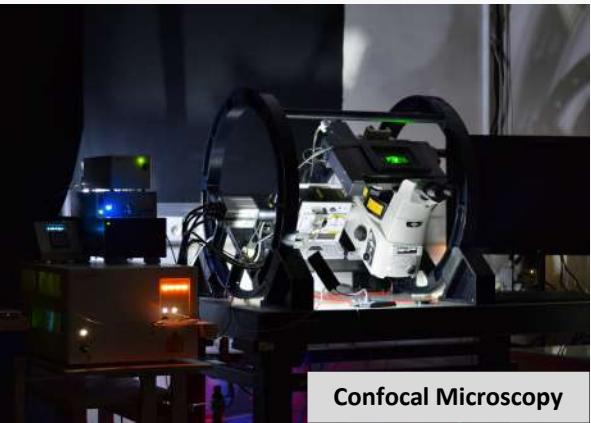
3D Printing

Confocal Microscopy

Microfluidic

MATHIAS FINK
ULTRASOUNDS (ERC)

MICKAEL TANTER
IMAGERY FOR
MEDICINE (ERC)

CHRISTIAN SERRE
METAL ORGANIC
FRAMEWORKS

ANKE LINDNER
COMPLEX FLUIDS
CNRS SILVER MEDAL

ANDREW GRIFFITHS
MICROFLUIDICS FOR
PHARMA (ERC)

SANDRINE ITHURRIA
QUANTUM DOTS (ERC)

Name

Name

ParisTech
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KEY FACTS / FIGURES

522 researchers / teacher-researchers
267 PhD candidates

Prestigious partnerships with academic laboratories and companies

SAINT-GOBAIN   TOTAL   L'ORÉAL PARIS   BASF The Chemical Company

About 500 publications per year including 10-15% in journals with impact factor > 10

HUTCHINSON®   MICHELIN   SOLVAY asking more from chemistry®

30 patents per year
3 startups created each year

6 Nobel Prizes, 17 ERC grants, CNRS Silver Medal, UNESCO-L'Oréal For Women in Science awardees Young Researchers

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PHYSICS

7: Nicolas Bergeal
8, 42: Zhuoying Chen
41 : Kamran Behnia
58,60 : Benoit Fauqué

PHYSICS AND MATERIALS (D. RODITCHEV)
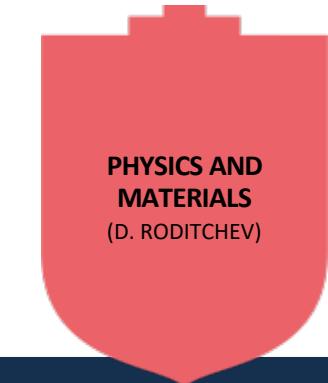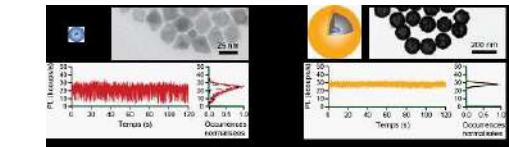
Solid state physics, Nanoscience, Instrumentation
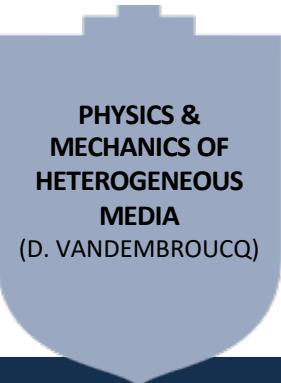
PHYSICS & MECHANICS OF HETEROGENEOUS MEDIA (D. VANDEMBROUCQ)
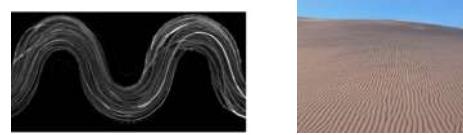
Hydrodynamics, solid mechanics, statistical physics

49: Philippe Marcq

87: Xiaoping Jia

LANGEVIN INSTITUTE « WAVES & IMAGES » (A. TOURIN)
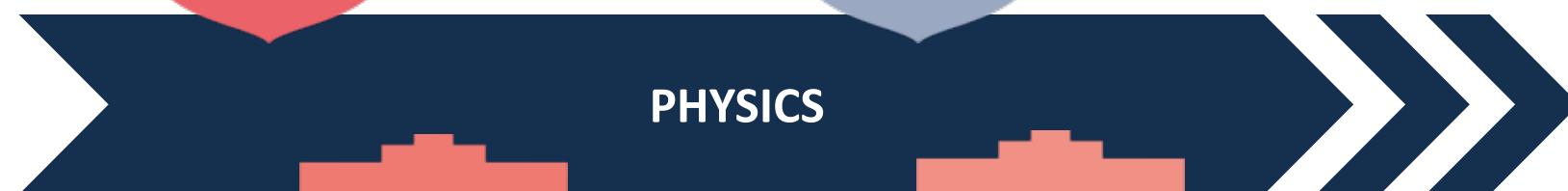
Wave physics and imaging

PHYSICS FOR MEDECINE (M. TANTER)
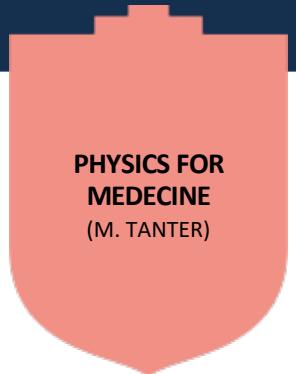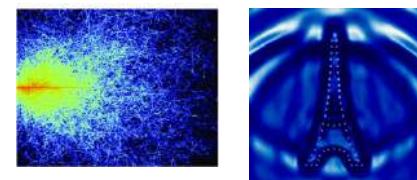
Ultrasound imaging and therapy
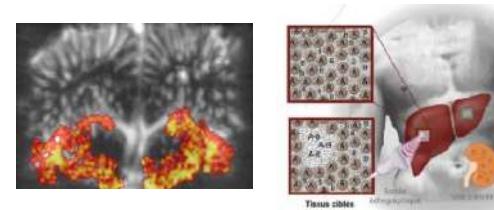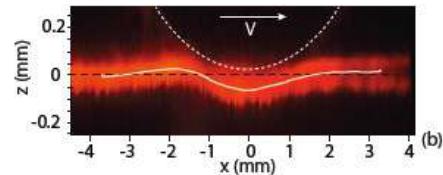
22,24 : Olivier Dauchot
88: Antony Maggs
91: Teresa Lopez-Leon

GULLIVER
(O. DAUCHOT)
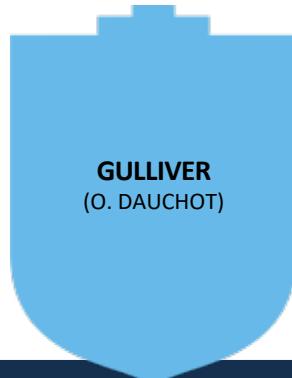
Physical-chemistry, soft matter theory, microfluidics

SOFT MATTER SCIENCES & ENGINEERING
(E. BARTHEL)
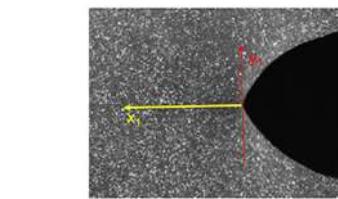
Soft matter (physics, chemistry) mechanical properties, interfaces

104,105,107
Jean Comtet

PHYSICS

CHEMISTRY

1 : Benjamin Laroche

Organic chemistry, Polymers chemistry, material science

MOLECULAR, MACROMOLECULAR CHEMISTRY & MATERIALS
(M. CLOITRE)

PARIS POROUS MATERIAL INSTITUTE
(C. SERRE)
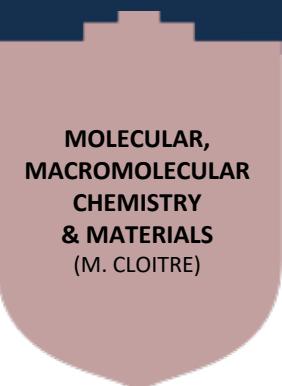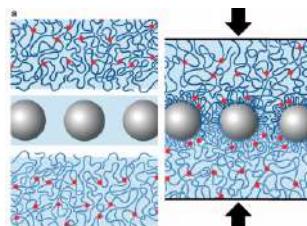
Porous materials, nanomaterials
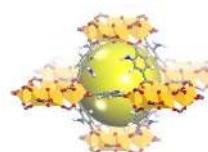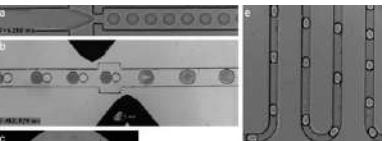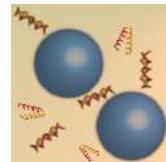
25 : Corentin Tregouet
28: Annie Colin

CHEMISTARY BIOLOGY & INNOVATION (J. BIBETTE)

Colloids and micro-fluidics
Biochemistry,
Analytical chemistry

BRAIN PLASTICITY (T. PREAT)

Neurobiology,
brain, memory

CHEMISTRY
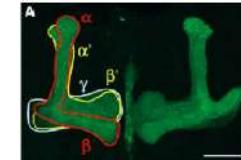
BIOLOGY

Identification and characterization of proteins, peptides and peptidomimetic molecules
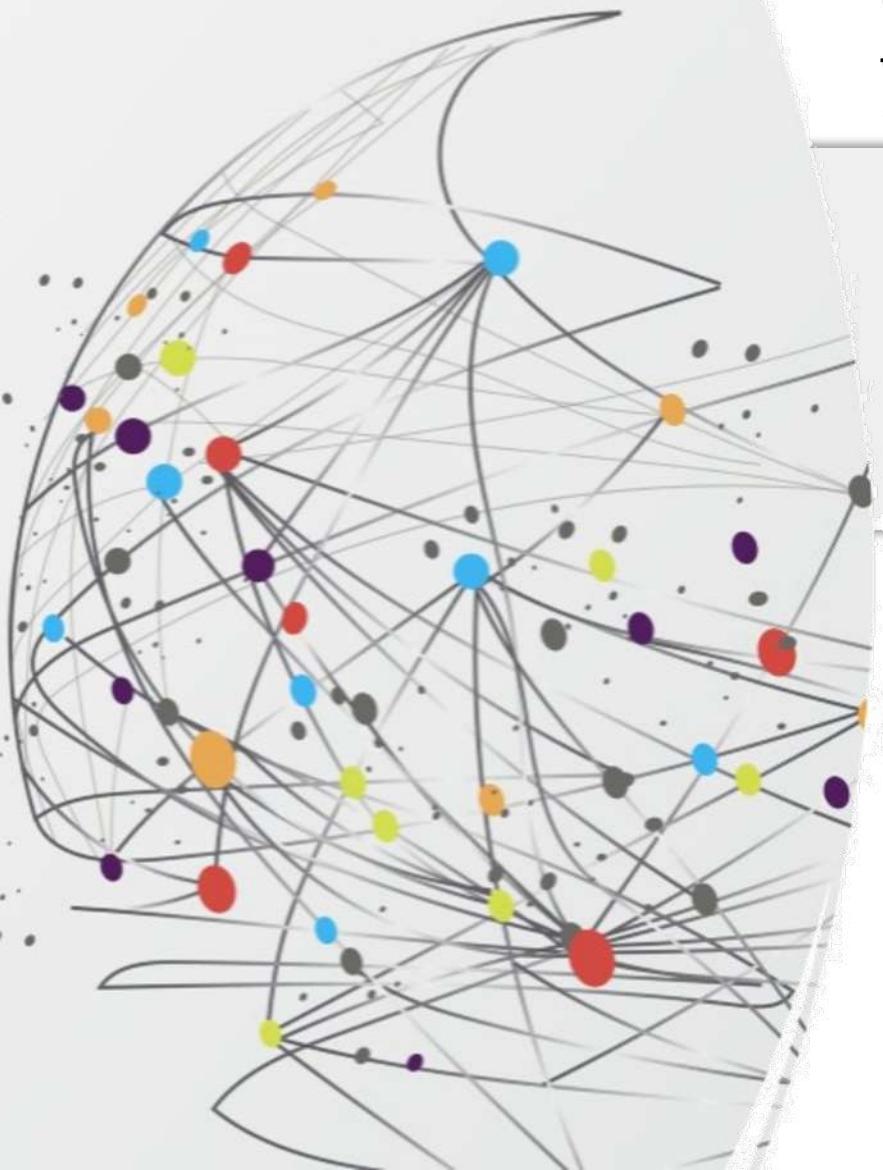
Institut d'Optique – 3 locations

Education

Research   Innovation

Paris Saclay

Campus Paris Saclay
FONDATION DE COOPERATION SCIENTIFIQUE

Labo C. Fabry

503 INSTITUT d'OPTIQUE CENTRE ENTREPRENEURIAL

St Etienne

Université Jean Monnet SAINT-ETIENNE

Bordeaux

université de BORDEAUX

Espace 503

Labo H. Curien

POLE ora Optique Rhône-Alpes
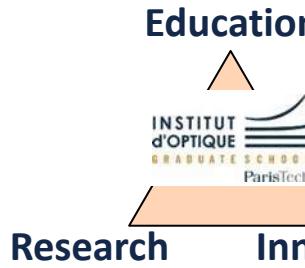
Labo LP2N

Inria INVENTEURS DU MONDE NUMÉRIQUE
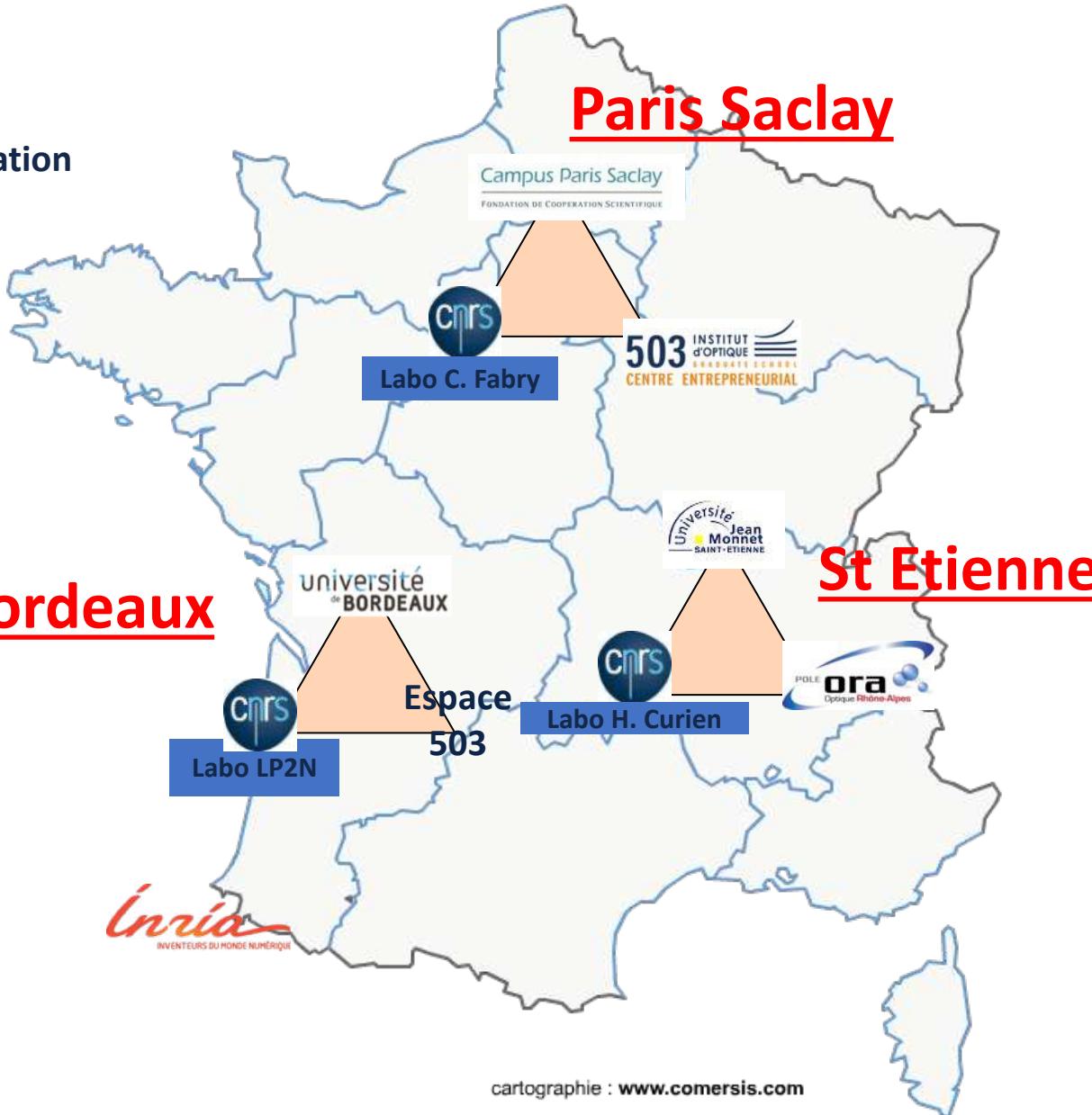
cartographie : www.comersis.com

RESEARCHERS AT INSTITUT D'OPTIQUE GRADUATE SCHOOL

ALAIN ASPECT

Holweck Medal (1991)
Wolf Prize in Physics (2010)
Albert Einstein Medal (2012)
ForMemRS (2015)

PHILIPPE GRANGIER

Léon Brillouin Grand Prix (2013)
Jean-Ricard Prize (2008)
Lazare Carnot Prize (2005)
CNRS Silver medal (2002)

JEAN-JACQUES GREFFET

OSA fellow
Recipient of the Servant
prize of the French
Academy of Science

Laurent COGNET

Jean Jerphagnon Prize (2010)
Pierre Faurre Prize (2011)
ERC synergiy awardee (2020)

Start up: Muquans, Pasqal, Stereolabs, Damae Medical …

LP2N

Photonics, Numerical and Nanosciences Laboratory (LP2N) is a Joint Research Unit (UMR 5298) between the Institut d'Optique Graduate School, the University of Bordeaux and the CNRS.

20 researchers
30 PhD/Post-doc

Bordeaux Nanophotonics Group

Light in Complex Nanostructures (COS) group

"Cold Atoms in Bordeaux" (CAB) group

BioImaging & OptoFluidics group

Nano-BioMicroscopy team (NabLab)

Computational Imaging and Display

Photonics systems

Laboratoire Photonique, Numérique et Nanosciences (LP2N)

LCF
Laboratoire Charles Fabry

40 researchers
60 PhD/Post-doc

Quantum Gases group

Quantum Optics group

Laser group

Nanophotonics group

Biophtonics group

Imaging & Information group

Nonlinear optics group

XUV optics group

Palaiseau

RESEARCH AT
MINES PARISTECH - PSL

JULIEN HACCOUN

ParisTech
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- Founded in 1783 to train engineers, now **a graduate school in Science, Engineering and Economics**

- **Founding member of ParisTech & PSL – Université Paris Sciences et Lettres**

- **Founding and prime member of Institut Carnot M.I.N.E.S.**

- **Member of IMT – Institut Mines Télécom**

- **5 sites**: Paris, Evry, Fontainebleau, Palaiseau and Sophia Antipolis

- ~240 professors, ~1000 students, ~400 PhD candidates

- **17 research centres & 2 institutes within 5 departments**

  → Earth & Environmental sciences

  → Mathematics & systems

  → Mechanics & materials

  → Energy & processes

  → Economy, management & society

- **More than 50% of graduated PhD work in industry**

Research domains at MINES ParisTech – PSL:

Energy and process engineering
- Centre for Energy Efficiency of Systems (CES)
- Centre Thermodynamics of Processes (CTP)
- Centre Observation, Impacts, Energy (O.I.E.)
- Centre for Processes, Renewable Energies and Energy Systems (PERSEE)

Earth sciences and environment
- Centre for Geosciences (GEOSCIENCES)
- Higher Institute for Environmental Engineering and Management (ISIGE)

Mathematics and complex systems
- Centre of robotics (CAOR)
- Centre for bio-informatics (CBIO)
- Centre Automatic Control and Systems (CAS)
- Centre of Applied Mathematics (CMA)
- Centre of Mathemacial Morphology (CMM)
- Centre of Computer Sciences (CRI)

Materials and mechanics
- Centre of Material Transformation (CEMEF)
- Centre of Material Engineering (MAT)

Economy, management and society
- Centre for Industrial Economics (CERNA)
- Centre for Management Science (CGS)
- Research Center on Risks and Crisis (CRC)
- Centre for the Sociology of Innovation (CSI)

IHEIE

Institute of Higher Education for Innovation and Entrepreneurship
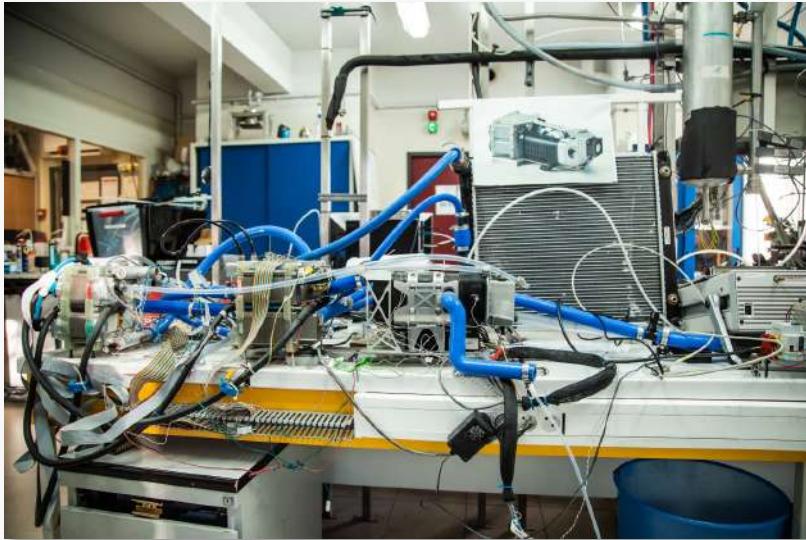
RESEARCHER AT MINES ParisTech – PSL
Recent award / grant recipients

Tatiana BUDTOVA - Cemef
CNRS silver medal 2020

Pierre Rouchon - CAS
ERC Advanced Grant 2020

Zaki Leghtas - CAS
ERC starting Grant 2019

KEY FACTS / FIGURES

~100 PhDs awarded annually (25 % of women, 30 % of foreigners (~50 nationalities), 50 % engineers)
232 teaching researchers (15% recruited abroad)

400+ scientific publications rank A / year

300+ patents & softwares in 2019

2 Nobel prizes
Maurice ALLAIS - Economics - 1988
Georges CHARPAK – Physics – 1992
2 ERC in the past 3 years

Prestigious partnerships with academic laboratories, companies:

20 % of research contracts completed with international partners.
Partnerships with: MIT, CalTech, Jülich, CERN, Stanford

25 industrial chairs / 200 industrial partners
MINES ParisTech ranks number one in France for the volume of contractual research with companies.
1000 /year Research contracts – 30 M

CONTACTS

ParisTech

Contacts in China:

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Director of ParisTech in Asia

marie.deboni@paristech.fr

For any question concerning the ParisTech – CSC PhD Program:

china@paristech.fr

Tel: +86 21 65 98 23 36

ParisTech

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4. Labs and PhD proposals

NOVEMBER 2021

ROOMS / THEMES

ROOM 1	→	LIFESCIENCE + ENVIRONMENT SCIENCE
ROOM 2	→	CHEMISTRY AND CHEMICAL ENGINEERING
ROOM 3	→	DESIGN INDUSTRIALIZATION + MATERIAL SCIENCE
ROOM 4	→	PHYSICS, OPTICS +ENERGY
ROOM 5	→	MECHANICS AND FLUIDS
ROOM 6	→	ENERGY + INFORMATION AND COMMUNICATION

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File number	School	Title	Advisors	Lab
2021_099	AgroParisTech	Top-down Regulation of Olfactory Sensitivity in the Insect Brain	Abhishek Chatterjee, Sylvia Anton	IEES Paris - Institut d'Ecologie et des Sciences de l'Environnement de Paris
2021_050	AgroParisTech	Deciphering the periolfactome of a pest species	Martine Maďbčche, Thomas Chertemps	IEES Paris - Institut d'Ecologie et des Sciences de l'Environnement de Paris
2021_059	Chimie ParisTech - PSL	Mechanochemistry-assisted continuous catalysis in green solvent	Christophe Len, Carlo Adamo	I-CLEHS - Institute of chemistry for life and health
2021_110	Chimie ParisTech - PSL	Asymmetric Catalysis toward BioRelevant Architecturally Novel Natural and Unnatural Products	Virginie Vidal, Phannarath Phansavath	I-CLEHS - Institute of chemistry for life and health
2021_003	Chimie ParisTech - PSL	Development of Selective Antibacterial Organometallic Drug Candidates	Gilles Gasser, Kevin Cariou	I-CLEHS - Institute of chemistry for life and health
2021_004	Chimie ParisTech - PSL	Photocatalysis in Living Cells with Earth Abundant Metals for Cancer Therapy	Gilles Gasser	I-CLEHS - Institute of chemistry for life and health
2021_078	Chimie ParisTech - PSL	Engineering of Multimodal Magnetic Resonance and optical Imaging using targeted theranostic nanoparticles for diagnosis and therapeutic studies against cancer in preclinics.	Bich-Thuy Doan	I-CLEHS - Institute of chemistry for life and health
2021_051	Chimie ParisTech - PSL	In-silico design of improved electron acceptors for organic photovoltaic applications	Carlo Adamo	I-CLEHS - Institute of chemistry for life and health
2021_011	Chimie ParisTech - PSL	Design of new photoactivable systems using theoretical approaches	Ilaria Ciofini	I-CLEHS - Institute of chemistry for life and health
2021_056	Chimie ParisTech - PSL	Mechanochemistry-Assisted Continuous Synthesis of Organometallic Complexes of Medicinal Relevance	Christophe Len, Kevin Cariou, Gilles Gasser	I-CLEHS - Institute of chemistry for life and health
2021_079	Chimie ParisTech - PSL	Continuum solvation for extended periodic systems	Frederic Labat, Carlo Adamo	I-CLEHS - Institute of chemistry for life and health
2021_053	Chimie ParisTech - PSL	Modeling Proton Transfer Reactions with Biased Ab-initio Dynamics	Carlo Adamo	I-CLEHS - Institute of chemistry for life and health

File number	School	Title	Advisors	Lab
2021_049	ESPCI Paris - PSL	A mechano-chemical model of hydra morphogenesis	Philippe Marcq	Physique et mécanique des Milieux Hétérogčnes
2021_111	ESPCI Paris - PSL	Interactions between the circadian and dopaminergic systems in Parkinson disease studied in Drosophila	Birman Serge	Plasticité du cerveau
2021_067	Arts et Métiers	Modeling of metal nanoparticles embedded in viscoelastic media using fluid-structure interaction approach	Adil El Baroudi, Jean Yves Le Pommellec, Amine Ammar	LAMPA - Laboratoire angevin de mécanique, procédés et innovation
2021_032	Arts et Métiers	The mechanics of earthquakes and faulting: Influence of friction properties and fault material on rupture tip propagation	Amine Ammar, Saber El Arem	LAMPA - Laboratoire angevin de mécanique, procédés et innovation
2021_084	Ecole des Ponts ParisTech	Spatio-temporal variability of rainfall drop size distribution across scales: retrieval, characterization and uses	Ioulia Tchiguirinskaia, Auguste Gires	HM & Co - Hydrologie Météorologie et Complexité
2021_096	Ecole des Ponts ParisTech	Optimal implementation of Nature-Based Solutions to mitigate Urban Heat Islands	Pierre-Antoine Versini	HM & Co - Hydrologie Météorologie et Complexité
2021_097	Ecole des Ponts ParisTech	Develop an innovative framework to assess the environmental performances of a new train station over time	Pierre-Antoine Versini	HM & Co - Hydrologie Météorologie et Complexité
2021_089	MINES ParisTech - PSL	Artificial ground freezing : from laboratory experiments development to in-situ scale predictions	Ahmed Rouabhi, Emad Jahangir	GEOSCIENCES - Centre de Géosciences
2021_005	Chimie ParisTech - PSL	Iodoarene Catalysis through Aerobic Photocatalytic and Electrocatalytic Activations.	Kevin Cariou	I-CLEHS - Institute of chemistry for life and health

File number	School	Title	Advisors	Lab
2021_023	Chimie ParisTech - PSL	Surface treatments of aluminium alloys and corresponding corrosion behavior. Focus on the role of intermetallic particles.	Jolanta Swiatowska, Frédéric Wiame, Philippe Marcus	IRCP - Institut de Recherche de Chimie de Paris
2021_027	Chimie ParisTech - PSL	Synthesis of Biodegradable Polymers from Renewable Resources	Regis Gauvin, Christophe Thomas	IRCP - Institut de Recherche de Chimie de Paris
2021_029	Chimie ParisTech - PSL	Vectorizing nanoparticles using biocompatible and biodegradable polymer coating mediated by surface organometallic chemistry	Regis Gauvin, Christophe Thomas	IRCP - Institut de Recherche de Chimie de Paris
2021_031	Chimie ParisTech - PSL	Synthesis of Biobased Polymers from Renewable Resources: A New Tandem Approach	Christophe Thomas, Regis Gauvin	IRCP - Institut de Recherche de Chimie de Paris
2021_033	Chimie ParisTech - PSL	Smart multi-catalytic systems for the production of biocompatible polymers	Christophe Thomas, Regis Gauvin	IRCP - Institut de Recherche de Chimie de Paris
2021_047	Chimie ParisTech - PSL	Environmental behavior of novel multi-principal element alloys containing molybdenum	Dimitri Mercier, Philippe Marcus	IRCP - Institut de Recherche de Chimie de Paris
2021_071	Chimie ParisTech - PSL	Plastics Conversion in Molten Salts	Vincent Semetey, Virginie Lair	IRCP - Institut de Recherche de Chimie de Paris
2021_108	Chimie ParisTech - PSL	Surface reactivity of Mg anode in high-energy density Mg-air battery	Jolanta Swiatowska	IRCP - Institut de Recherche de Chimie de Paris
2021_030	Chimie ParisTech - PSL	2D/3D Perovskites for Stable and High-Efficiency Solar Cells	Thierry Pauporté	IRCP - Institut de Recherche de Chimie de Paris
2021_083	Chimie ParisTech - PSL	Recycling polyurethane using	Vincent Semetey	IRCP - Institut de Recherche de Chimie de Paris

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File number	School	Title	Advisors	Lab
2021_001	ESPCI Paris - PSL	Asymmetric multicomponent reactions in continuous-flow	Benjamin Laroche	C3M - Chimie Moléculaire, Macromoléculaire, et Matériaux
2021_028	ESPCI Paris - PSL	Using good vibrations to decrease the viscosity of non brownian suspensions.	Annie Colin	CBI - Chimie, Biologie et Innovation
2021_112	MINES ParisTech - PSL	Formulation of BioSynthetic Opals: How to Better Imitate the Mineralogy and Develop Inventive Systems	Severine A.e. Boyer, Alain Burr	CEMEF - Centre de mise en forme des matériaux
2021_025	ESPCI Paris - PSL	Entrance effects in osmotic nanofluidics for Blue Energy	Corentin Trégouët, Annie Colin	CBI - Chimie, Biologie et Innovation

PROPOSALS/LABS 1/2

File number	School	Title	Advisors	Lab
2021_095	Arts et Métiers	Consequences of climate change on the structural integrity of buried large-diameter water-transmission mains	Humberto Yanez Godoy	I2M - Institut de Mécanique et d'ingénierie
2021_012	Arts et Métiers	Machine learning based Adaptive Multivariate Statistical Process Control	Jean-Yves Dantan, Lazhar Homri, Wahb Zouhri	LCFC - Laboratoire de conception, fabrication, commande
2021_013	Arts et Métiers	Supervised machine learning for tolerance allocation	Jean-Yves Dantan	LCFC - Laboratoire de conception, fabrication, commande
2021_039	Arts et Métiers	Risk management of engineering products driven by artificial intelligence	Ali Siadat, Jelena Petronijevic, Alain Etienne	LCFC - Laboratoire de conception, fabrication, commande
2021_043	Arts et Métiers	Innovative Design for Additive Manufacturing through Knowledge Management and TRIZ	Ali Siadat, Alaa Hassan	LCFC - Laboratoire de conception, fabrication, commande
2021_052	Arts et Métiers	Robust robotic grinding control to take into account process variability	Régis Bigot, Thibaut Raharijaona, Sandra Chevret	LCFC - Laboratoire de conception, fabrication, commande
2021_054	Arts et Métiers	Automation of a flexible and agile finishing process of forged workpieces with industrial robots	Tudor Balan, Cyrille Baudouin, Sandra Chevret	LCFC - Laboratoire de conception, fabrication, commande
2021_065	Arts et Métiers	How to adapt reconfigurable production systems to product variability	Jean-Yves Dantan, Ali Siadat, Paul Stief	LCFC - Laboratoire de conception, fabrication, commande
2021_085	Arts et Métiers	Design a safe work-cell for human-robot co-activity in industry	Thibaut Raharijaona, Yier Wu, Jonathan Savin	LCFC - Laboratoire de conception, fabrication, commande
2021_094	Arts et Métiers	Identification of parameters control and Improvement from thixoforging process of aluminums (vs Steel)	Régis Bigot	LCFC - Laboratoire de conception, fabrication, commande

PROPOSALS/LABS 2/2

File number	School	Title	Advisors	Lab
2021_106	Arts et Métiers	Modeling of the wood behavior under severe loading conditions: case of the veneer cutting by rotary peeling process	Louis Denaud, Mariem Yaich, Stéphane Girardon	LABOMAP - Laboratoire Bourguignon des matériaux et procédés
2021_014	Arts et Métiers	Contribution to the integration of Additive Manufacturing and Augmented Reality in early design phases to foster Creativity	Frédéric Segonds, Ruding Lou	LCPI - Laboratoire conception de produits et innovation
2021_035	Arts et Métiers	Learning with immersive technologies	Simon Richir, Geoffrey Gorisse, Sylvain Fleury	LAMPA - Laboratoire angevin de mécanique, procédés et innovation
2021_086	Arts et Métiers	Intelligent Visual Analytics for the Design and Monitoring of Turbo Engine Systems	Samir Garbaya, Sofiane Khelladi	LIFSE - Laboratoire Ingénierie des Fluides Systčmes Energétiques
2021_026	Arts et Métiers	Simultaneous optimization of anisotropy and topology of composites from additive manufacturing process by considering strength criteria based on invariants	Marco Montemurro, Anita Catapano	I2M - Institut de Mécanique et d'ingénierie
2021_101	Arts et Métiers	Modeling of the fluid-solid interactions during steady and transient flows of non-Newtonian fluids through deformable porous media	Azita Ahmadi-Senichault, Antonio Rodriguez De Castro, Abdelaziz Omari	I2M - Institut de Mécanique et d'ingénierie
2021_102	Arts et Métiers	Multi-scale approach for the development of effective soil remediation methods based on foam injection	Azita Ahmadi-Senichault, Antonio Rodriguez De Castro, Abdelaziz Omari	I2M - Institut de Mécanique et d'ingénierie

File number	School	Title	Advisors	Lab
2021_055	Arts et Métiers	Sensorless Control for Integrated Multiphase Drives applied to Transportation Systems Using Artificial Intelligence Potentiality	Ngac Ky Nguyen	L2EP - aboratoire d'Electrotechnique et électronique de puissance
2021_063	Arts et Métiers	Towards the definition of Industry 4.0 and 5.0 Key Performance Indicators	Nathalie Klement, Ali Siadat, Virginie Goepp	LISPEN - Laboratoire d'ingénierie des systčmes physiques et numériques
2021_068	Arts et Métiers	A decision aid system based on a decentralized architecture to faster the management of hazards occurring under production and logistics systems	Nathalie Klement, Esma Yahia, Lionel Roucoules	LISPEN - Laboratoire d'ingénierie des systčmes physiques et numériques
2021_074	Arts et Métiers	Learning with immersive technologies	Simon Richir, Geoffrey Gorisse, Sylvain Fleury	LAMPA - Laboratoire angevin de mécanique, procédés et innovation
2021_075	Arts et Métiers	Analysis, modeling and simulation of parametric resonances of piezoelectric structures. Application to nano-systems and energy harvesting	Olivier Thomas, Christophe Giraud-Audine, Simon Benacchio	LISPEN - Laboratoire d'ingénierie des systčmes physiques et numériques
2021_080	Arts et Métiers	Graph-based unbounded constrained models search for high-level logical reasoning	Jean-Philippe Pernot, Mathias Kleiner	LISPEN - Laboratoire d'ingénierie des systčmes physiques et numériques

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PROPOSALS/LABS 2/2

File number	School	Title	Advisors	Lab
2021_069	Institut d'Optique Graduate School	Improving super-resolved localization microscopes (PALM) in deep and heterogeneous samples with co-designed optimal phase masks	François Goudail	Laboratoire Charles Fabry
2021_046	Arts et Métiers	Integrated Virtual Simulation and Visualization of Manufacturing Processes using Numerical Simulation and Augmented Reality	Jose Outeiro, Jean-Rémy Chardonnet	LABOMAP - Laboratoire Bourguignon des matériaux et procédés
2021_045	Arts et Métiers	Development and optimization of tool design/geometry for drilling aerospace alloys using LCO2 and other environmentally friendly metalworking fluids	Jose Outeiro, Michael Deligant, Frédéric Rossi	LABOMAP - Laboratoire Bourguignon des matériaux et procédés
2021_082	Arts et Métiers	Sustainability assessment and multi-physical/multi-scale modelling of surface integrity in machining of Inconel 718 superalloy using advanced cutting tools materials	José Outeiro, Hélčne Birembaux, Aurélien Besnard	LABOMAP - Laboratoire Bourguignon des matériaux et procédés
2021_021	Arts et Métiers	Surface integrity of Ti-6Al-4V alloy components produced by SLM and machining processes: multiphysics simulations and experimental validation	Jose Outeiro, Abdelhadi Moufki	LABOMAP - Laboratoire Bourguignon des matériaux et procédés
2021_018	Arts et Métiers	Improvement of surface properties by PVD-Thermochemistry hybrid treatment on metal substrates obtained by conventional manufacturing processes and by powder metallurgy	Corinne Nouveau, Dominique Cotton	LABOMAP - Laboratoire Bourguignon des matériaux et procédés

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File number	School	Title	Advisors	Lab
2021_024	ESPCI Paris - PSL	Morphological Swarm Robotics	Olivier Dauchot	GULLIVER - Voyages expérimentaux et théoriques en matičre molle
2021_088	ESPCI Paris - PSL	Physics and algorithms for molecular modeling	Anthony Maggs	GULLIVER - Voyages expérimentaux et théoriques en matičre molle
2021_022	ESPCI Paris - PSL	Active Colloidal Gels	Olivier Dauchot	GULLIVER - Voyages expérimentaux et théoriques en matičre molle
2021_091	ESPCI Paris - PSL	Active liquid crystals: Controlling active flows through "smart confinement"	Teresa Lopez-Leon	GULLIVER - Voyages expérimentaux et théoriques en matičre molle
2021_002	Institut d'Optique Graduate School	Production of new striking visual appearance with disordered metasurfaces composed of random arrays of resonant nanoparticles.	Philippe Lalanne	LP2N - Laboratoire Photonique, numérique et nanosciences
2021_006	Institut d'Optique Graduate School	Dissipative strong coupling with non-Hermitian nanoresonators.	Philippe Lalanne	LP2N - Laboratoire Photonique, numérique et nanosciences
2021_020	Institut d'Optique Graduate School	High-power versatile GHz frequency combs for spectral and temporal domains applications	Eric Cormier, Giorgio Santarelli	LP2N - Laboratoire Photonique, numérique et nanosciences
2021_070	Institut d'Optique Graduate School	High sensitive Atom Interferometry using multi-photon interrogation in an optical cavity	Benjamin Canuel, Philippe Bouyer	LP2N - Laboratoire Photonique, numérique et nanosciences
2021_072	Institut d'Optique Graduate School	development of UV laser sources for applications in quantum physics	Adčle Hilico, Giorgio Santarelli	LP2N - Laboratoire Photonique, numérique et nanosciences
2021_090	Institut d'Optique Graduate School	Coherent dipole-dipole coupling of quantum emitters and manipulation of their degree of entanglement	Brahim Lounis, Jean-Baptiste Trebbia	LP2N - Laboratoire Photonique, numérique et nanosciences
2021_092	Institut d'Optique Graduate School	Exploring the optical properties of perovskite single nanocrystals and superlattices	Brahim Lounis, Philippe Tamarat	LP2N - Laboratoire Photonique, numérique et nanosciences
2021_093	Institut d'Optique Graduate School	Fast Josephson-junction control by optical manipulation of a flux quantum	Brahim Lounis, Philippe Tamarat	LP2N - Laboratoire Photonique, numérique et nanosciences
2021_057	Institut d'Optique Graduate School	Polarization sensitive single particle tracking and super-resolution microscopy in the near-infrared for brain imaging	Laurent Cognet	LP2N - Laboratoire Photonique, numérique et nanosciences

File number	School	Title	Advisors	Lab
2021_007	ESPCI Paris - PSL	Novel two dimensional Rashba materials for spintronics.	Nicolas Bergeal, Sergio Vlaic	LPEM - Laboratoire Physique et d'études des matériaux
2021_041	ESPCI Paris - PSL	Hydrodynamics of electrons and phonons in bulk semimetals	Kamran Behnia	LPEM - Laboratoire Physique et d'études des matériaux
2021_058	ESPCI Paris - PSL	Bad metals and soft mode in the quantum paralectrics	Benoit Fauqué, Philippe Bourges	LPEM - Laboratoire Physique et d'études des matériaux
2021_060	ESPCI Paris - PSL	lectronic and Thermoelectrical properties of dilute metals	Benoit Fauqué, Kamran Behnia	LPEM - Laboratoire Physique et d'études des matériaux
2021_008	ESPCI Paris - PSL	Efficient and Stable Semi-Transparent Perovskite Solar Cells	Zhuoying Chen, Lionel Aigouy	LPEM - Laboratoire Physique et d'études des matériaux
2021_042	ESPCI Paris - PSL	Nanoparticles, Nanowire, and Nanosheets of Hybrid Perovskite Halides: From Synthesis to Applications	Zhuoying Chen, Alexei Chepelianskii, Miguel Monteverde	LPEM - Laboratoire Physique et d'études des matériaux
2021_104	ESPCI Paris - PSL	Nano-Rheology of Charged Solid/Liquid Interfaces	Jean Comtet	SIMM - Sciences et ingénierie de la matičre molle
2021_105	ESPCI Paris - PSL	Ionic transport at solid/liquid interfaces at the single charge scale	Jean Comtet	SIMM - Sciences et ingénierie de la matičre molle
2021_107	ESPCI Paris - PSL	Single Molecule Investigation of Polymer Chain Dynamics at Interfaces	Jean Comtet	SIMM - Sciences et ingénierie de la matičre molle

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File number	School	Title	Advisors	Lab
2021_044	Arts et Métiers	Fluid Dynamic Unsteadiness in Multiphase Turbomachinery	Antoine Dazin, Francesco Romano	LMFL - Laboratoire de mécanique des fluides de Lille
2021_048	Arts et Métiers	Single and Multiple Cavitating Bubbles near a Wall	Francesco Romano, Olivier Coutier-Delgosha, Antoine Dazin	LMFL - Laboratoire de mécanique des fluides de Lille
2021_081	Arts et Métiers	Physically informed and data-driven approaches towards reliable simulation of thermoplastic composite automotive components	Adil Benaarbia, Fodil Meraghni, Mourad Nachtane	LEM3 - Laboratoire d'étude des microstructures et de mécanique des matériaux
2021_015	Arts et Métiers	Development of guidelines tool to prevent the occurrence of plastic buckling in thin structures	Farid Abed-Meraim, Mohamed Ben Bettaieb	LEM3 - Laboratoire d'étude des microstructures et de mécanique des matériaux
2021_016	Arts et Métiers	Development of an advanced CPFEM tool for the prediction of formability limits of polycrystalline thin metal sheets	Farid Abed-Meraim, Mohamed Ben Bettaieb	LEM3 - Laboratoire d'étude des microstructures et de mécanique des matériaux
2021_017	Arts et Métiers	Development of an advanced numerical tool to predict the bendability limits during sheet metal forming processes	Farid Abed-Meraim, Mohamed Ben Bettaieb	LEM3 - Laboratoire d'étude des microstructures et de mécanique des matériaux
2021_062	Arts et Métiers	Smart and multiphysics solid-shell finite elements for the simulation of 3D thin structures	Farid Abed-Meraim, Hocine Chalal	LEM3 - Laboratoire d'étude des microstructures et de mécanique des matériaux
2021_064	Arts et Métiers	Forming limit predictions for porous materials in cold and warm sheet metal forming	Farid Abed-Meraim, Hocine Chalal	LEM3 - Laboratoire d'étude des microstructures et de mécanique des matériaux
2021_073	Arts et Métiers	Development of advanced multiscale computational tools for the multiphysics prediction of Carbon nanotubes (CNTs) fuzzy fiber composites	George Chatzigeorgiou, Fodil Meraghni, Adil Benaarbia	LEM3 - Laboratoire d'étude des microstructures et de mécanique des matériaux
2021_077	Arts et Métiers	Efficient computational framework to model size effects in miniaturized products	Farid Abed-Meraim, Mohamed Jebahi	LEM3 - Laboratoire d'étude des microstructures et de mécanique des matériaux
2021_076	Arts et Métiers	Multi-scale data-driven modelling of short-fibre reinforced composites for automotive applications	Fodil Meraghni, Francis Praud	LEM3 - Laboratoire d'étude des microstructures et de mécanique des matériaux
2021_087	ESPCI Paris - PSL	ULTRASONIC IMAGING OF SOFT GRANULAR MATERIALS AND BIOMEDICAL APPLICATIONS	Xiaoping Jia, Jean-Luc Gennisson	Institut Langevin

File number	School	Title	Advisors	Lab
2021_061	Arts et Métiers	Improving formability of lightweight metallic materials using process chaining: Incremental Forming and Friction Stir Welding	Philippe Dal Santo, Idriss Tiba, Sandra Chevret, Tudor Balan	LAMPA - Laboratoire angevin de mécanique, procédés et innovation
2021_098	Arts et Métiers	Phase field modeling of damage and fracture in polycrystalline materials under thermomechanical loading	Amine Ammar, Saber El Arem	LAMPA - Laboratoire angevin de mécanique, procédés et innovation
2021_100	Arts et Métiers	Nonlinear dynamics of cracked structures: aplication to wind turbines	Amine Ammar, Saber El Arem, Adil El Baroudi	LAMPA - Laboratoire angevin de mécanique, procédés et innovation
2021_109	Arts et Métiers	Reconstruction of heterogeneous surface residual-stresses in polycrystalline materials from X-ray diffraction measurements	Chedly Braham, Leo Morin	PIMM - Laboratoire Procédés et ingénierie en mécanique et matériaux
2021_009	Ecole des Ponts ParisTech	Controlling hygrothermics of biobased construction material	Philippe Coussot, Patrick Huber	Laboratoire NAVIER (mécanique, physique des matériaux et des structures, géotechnique)
2021_010	Ecole des Ponts ParisTech	Gas transfer in the compacted bentonite-based materials	Yujun Cui	Laboratoire NAVIER (mécanique, physique des matériaux et des structures, géotechnique)
2021_019	Arts et Métiers	Measurement of residual stresses in materials: FEM-based simulation of X-ray diffraction	Dorian Depriester, Laurent Barrallier	MSMP - Laboratoire Mécanique, Surface, Matériaux et Procédés
2021_034	Arts et Métiers	Multiscale stress/strain analysis of polycrystalline silicon for photovoltaic applications	Laurent Barrallier	MSMP - Laboratoire Mécanique, Surface, Matériaux et Procédés
2021_036	Arts et Métiers	Thermal and mechanical fatigue behavior of selective laser melting maraging steel (H11 or H13)	Nan Kang, Mohamed El Mansori	MSMP - Laboratoire Mécanique, Surface, Matériaux et Procédés
2021_037	Arts et Métiers	Multi-scaled structure design of thermal controllable complex conforming cooling channel system in selective laser melting process	Mohamed El Mansori, Nan Kang	MSMP - Laboratoire Mécanique, Surface, Matériaux et Procédés
2021_038	Arts et Métiers	Mechanical and Functional fatigue behavior of selective laser melted NiTi Shape Memory Alloy	Mohamed El Mansori, Mourad El Hadrouz	MSMP - Laboratoire Mécanique, Surface, Matériaux et Procédés
2021_040	Arts et Métiers	Optimized set-up to characterize the contact fatigue damage of material with gradient properties	Jean-Patrick Goulmy, Laurent Barrallier	MSMP - Laboratoire Mécanique, Surface, Matériaux et Procédés

PROPOSALS/LABS 1/2

File number	School	Title	Advisors	Lab
2021_055	Arts et Métiers	Sensorless Control for Integrated Multiphase Drives applied to Transportation Systems Using Artificial Intelligence Potentiality	Ngac Ky Nguyen	L2EP - aboratoire d'Electrotechnique et électronique de puissance
2021_063	Arts et Métiers	Towards the definition of Industry 4.0 and 5.0 Key Performance Indicators	Nathalie Klement, Ali Siadat, Virginie Goepp	LISPEN - Laboratoire d'ingénierie des systčmes physiques et numériques
2021_068	Arts et Métiers	A decision aid system based on a decentralized architecture to faster the management of hazards occurring under production and logistics systems	Nathalie Klement, Esma Yahia, Lionel Roucoules	LISPEN - Laboratoire d'ingénierie des systčmes physiques et numériques
2021_074	Arts et Métiers	Learning with immersive technologies	Simon Richir, Geoffrey Gorisse, Sylvain Fleury	LAMPA - Laboratoire angevin de mécanique, procédés et innovation
2021_075	Arts et Métiers	Analysis, modeling and simulation of parametric resonances of piezoelectric structures. Application to nano-systems and energy harvesting	Olivier Thomas, Christophe Giraud-Audine, Simon Benacchio	LISPEN - Laboratoire d'ingénierie des systčmes physiques et numériques
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PROPOSALS/LABS 2/2

File number	School	Title	Advisors	Lab
2021_069	Institut d'Optique Graduate School	Improving super-resolved localization microscopes (PALM) in deep and heterogeneous samples with co-designed optimal phase masks	François Goudail	Laboratoire Charles Fabry
2021_046	Arts et Métiers	Integrated Virtual Simulation and Visualization of Manufacturing Processes using Numerical Simulation and Augmented Reality	Jose Outeiro, Jean-Rémy Chardonnet	LABOMAP - Laboratoire Bourguignon des matériaux et procédés
2021_045	Arts et Métiers	Development and optimization of tool design/geometry for drilling aerospace alloys using LCO2 and other environmentally friendly metalworking fluids	Jose Outeiro, Michael Deligant, Frédéric Rossi	LABOMAP - Laboratoire Bourguignon des matériaux et procédés
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2021_021	Arts et Métiers	Surface integrity of Ti-6Al-4V alloy components produced by SLM and machining processes: multiphysics simulations and experimental validation	Jose Outeiro, Abdelhadi Moufki	LABOMAP - Laboratoire Bourguignon des matériaux et procédés
2021_018	Arts et Métiers	Improvement of surface properties by PVD-Thermochemistry hybrid treatment on metal substrates obtained by conventional manufacturing processes and by powder metallurgy	Corinne Nouveau, Dominique Cotton	LABOMAP - Laboratoire Bourguignon des matériaux et procédés

PHD PROPOSALS - AGROPARISTECH

File number	Research field	Title	Advisors	Lab	Lab location	Lab website	Doctorate awarded by	Contact point
099	Biology, Biophysics and Biochemistry, Environment Science and Technology, Sustainable Development, Geosciences, Life and Health Science and Technology , Life Science and Engineering for Agriculture, Food and the Environment	Top-down Regulation of Olfactory Sensitivity in the Insect Brain	Abhishek Chatterjee, Sylvia Anton	IEES Paris - Institut d'Ecologie et des Sciences de l'Environnement de Paris	Versailles	https://iees-paris.fr/en/	AgroParisTech	abhishek.chatterjee@inrae.fr
050	Biology, Biophysics and Biochemistry, Life Science and Engineering for Agriculture, Food and the Environment	Deciphering the periolfactome of a pest species	Martine Maďbčche, Thomas Chertemps	IEES Paris - Institut d'Ecologie et des Sciences de l'Environnement de Paris	Paris	https://iees-paris.fr/	AgroParisTech	thomas.chertemps@sorbonne-universite.fr

File number	Research field	Subfield	Title	Advisors	Lab	Lab location	Lab website	Doctorate awarded by	Contact point
067	Biology, Biophysics and Biochemistry, Life and Health Science and Technology , Material science, Mechanics and Fluids		Modeling of metal nanoparticles embedded in viscoelastic media using fluid-structure interaction approach	Adil El Baroudi, Jean Yves Le Pommellec, Amine Ammar	LAMPA - Laboratoire angevin de mécanique, procédés et innovation	Angers	http://lampa.ensam.eu/	HESAM Université	adil.elbaroudi@ensam.eu
101	Chemistry, Physical chemistry and Chemical Engineering, Energy, Processes, Environment Science and Technology, Sustainable Development, Geosciences, Life and Health Science and Technology , Material science, Mechanics and Fluids	Transfer in porous media	Modeling of the fluid-solid interactions during steady and transient flows of non-Newtonian fluids through deformable porous media	Azita Ahmadi-Senichault, Antonio Rodriguez De Castro, Abdelaziz Omari	I2M - Institut de Mécanique et d'ingénierie	Bordeaux	https://www.i2m.u-bordeaux.fr/	HESAM Université	azita.ahmadi@ensam.eu
102	Chemistry, Physical chemistry and Chemical Engineering, Energy, Processes, Environment Science and Technology, Sustainable Development, Geosciences, Material science, Mechanics and Fluids	Transfer in porous media	Multi-scale approach for the development of effective soil remediation methods based on foam injection	Azita Ahmadi-Senichault, Antonio Rodriguez De Castro, Abdelaziz Omari	I2M - Institut de Mécanique et d'ingénierie	Bordeaux	https://www.i2m.u-bordeaux.fr	HESAM Université	azita.ahmadi@ensam.eu
012	Design, Industrialization	Industrial Eng., Artificial Intelligence	Machine learning based Adaptive Multivariate Statistical Process Control	Jean-Yves Dantan, Lazhar Homri, Wahb Zouhri	LCFC - Laboratoire de conception, fabrication, commande		http://lcfc.ensam.eu/	HESAM Université	lazhar.homri@ensam.eu
039	Design, Industrialization	Industrial Engineering	Risk management of engineering products driven by artificial intelligence	Ali Siadat, Jelena Petronijevic, Alain Etienne	LCFC - Laboratoire de conception, fabrication, commande	Metz	http://lcfc.ensam.eu/	HESAM Université	jelena.petronijevic@ensam.eu
043	Design, Industrialization		Innovative Design for Additive Manufacturing through Knowledge Management and TRIZ	Ali Siadat, Alaa Hassan	LCFC - Laboratoire de conception, fabrication, commande	Metz	http://lcfc.ensam.eu/	HESAM Université	alaa.hassan@univ-lorraine.fr; ali.siadat@univ-lorraine.fr
052	Design, Industrialization	Robotics & Manufacturing	Robust robotic grinding control to take into account process variability	Régis Bigot, Thibaut Raharijaona, Sandra Chevret	LCFC - Laboratoire de conception, fabrication, commande	Metz	http://lcfc.ensam.eu	HESAM Université	sandra.chevret@ensam.eu
054	Design, Industrialization	Manufacturing	Automation of a flexible and agile finishing process of forged workpieces with industrial robots	Tudor Balan, Cyrille Baudouin, Sandra Chevret	LCFC - Laboratoire de conception, fabrication, commande	Metz	http://lcfc.ensam.eu	HESAM Université	sandra.chevret@ensam.eu
085	Design, Industrialization		Design a safe work-cell for human-robot co-activity in industry	Thibaut Raharijaona, Yier Wu, Jonathan Savin	LCFC - Laboratoire de conception, fabrication, commande	Metz	http://lcfc.ensam.eu	HESAM Université	yier.wu@ensam.eu
106	Design, Industrialization, Energy, Processes, Environment Science and Technology, Sustainable Development, Geosciences, Material science, Mechanics and Fluids		Modeling of the wood behavior under severe loading conditions: case of the veneer cutting by rotary peeling process	Louis Denaud, Mariem Yaich, Stéphane Girardon	LABOMAP - Laboratoire Bourguignon des matériaux et procédés	Cluny	http://labomap.ensam.eu/	HESAM Université	louis.denaud@ensam.eu

File number	Research field	Subfield	Titile	Advisors	Lab	Lab location	Lab website	Doctorate awarded by	Contact point
014	Design, Industrialization, Information and Communication Science and Technology	Additive Manufacturing, Augmented Reality, Design Methodology, Creativity, Computer Graphics.	Contribution to the integration of Additive Manufacturing and Augmented Reality in early design phases to foster Creativity	Frédéric Segonds, Ruding Lou	LCPI - Laboratoire conception de produits et innovation	Paris	http://lcpi.ensam.eu/	HESAM Université	ruding.lou@ensam.eu
035	Design, Industrialization, Information and Communication Science and Technology	Virtual Reality	Learning with immersive technologies	Simon Richir, Geoffrey Gorisse, Sylvain Fleury	LAMPA - Laboratoire angevin de mécanique, procédés et innovation		http://lampa.ensam.eu/	HESAM Université	sylvain.fleury@ensam.eu
065	Design, Industrialization, Information and Communication Science and Technology	Engineering -> Industrial Engineering	How to adapt reconfigurable production systems to product variability	Jean-Yves Dantan, Ali Siadat, Paul Stief	LCFC - Laboratoire de conception, fabrication, commande	Metz	http://lcfc.ensam.eu/	HESAM Université	paul.stief@ensam.eu
086	Design, Industrialization, Information and Communication Science and Technology, Material science, Mechanics and Fluids	Intelligent Design and monitoring of Sustainable Systems	Intelligent Visual Analytics for the Design and Monitoring of Turbo Engine Systems	Samir Garbaya, Sofiane Khelladi	LIFSE - Laboratoire Ingénierie des Fluides Systĉmes Energétiques	Paris	https://lifse.artsetmetiers.fr/	HESAM Université	samir.garbaya@ensam.eu
081	Design, Industrialization, Material science, Mechanics and Fluids	Mechanical engineering, Computational mechanics, Mechanics of Materials.	Physically informed and data-driven approaches towards reliable simulation of thermoplastic composite automotive components	Adil Benaarbia, Fodil Meraghni, Mourad Nachtane	LEM3 - Laboratoire d'étude des microstructures et de mécanique des matériaux	Metz	http://www.lem3.univ-lorraine.fr/	HESAM Université	adil.benaarbia@ensam.eu
094	Design, Industrialization, Material science, Mechanics and Fluids	New Forming Process and Processus Eng., and material Eng,	Identification of parameters control and Improvement from thixoforging process of aluminums (vs Steel)	Régis Bigot	LCFC - Laboratoire de conception, fabrication, commande	Metz	http://lcfc.ensam.eu/	HESAM Université	eric.becker@ensam.eu
026	Design, Industrialization, Material science, Mechanics and Fluids, Mathematics and their applications	Mechanics of materials and structures, additive manufacturing, topology optimisation, material optimisation, multi-scale analysis	Simultaneous optimization of anisotropy and topology of composites from additive manufacturing process by considering strength criteria based on invariants	Marco Montemurro, Anita Catapano	I2M - Institut de Mécanique et d'ingénierie	Bordeaux	https://www.i2m.u-bordeaux.fr/	HESAM Université	marco.montemurro@ensam.eu
013	Design, Industrialization, Mathematics and their applications		Supervised machine learning for tolerance allocation	Jean-Yves Dantan	LCFC - Laboratoire de conception, fabrication, commande	Metz	http://www.lcfc.fr	HESAM Université	jean-yves.dantan@ensam.eu
055	Energy, Processes	Electrical Engineering and Automation Control	Sensorless Control for Integrated Multiphase Drives applied to Transportation Systems Using Artificial Intelligence Potentiality	Ngac Ky Nguyen	L2EP - aboratoire d'Electrotechnique et électronique de puissance	Lille	http://l2ep.univ-lille.fr	HESAM Université	ngacky.nguyen@ensam.eu
045	Energy, Processes, Material science, Mechanics and Fluids	Mechanical Engineering, Manufacturing Processes, Fluid dynamics	Development and optimization of tool design/geometry for drilling aerospace alloys using LCO2 and other environmentally friendly metalworking fluids	Jose Outeiro, Michael Deligant, Frédéric Rossi	LABOMAP - Laboratoire Bourguignon des matériaux et procédés	Cluny	http://labomap.ensam.eu	HESAM Université	jose.outeiro@ensam.eu

File number	Research field	Subfield	Titile	Advisors	Lab	Lab location	Lab website	Doctorate awarded by	Contact point
032	Environment Science and Technology, Sustainable Development, Geosciences, Material science, Mechanics and Fluids		The mechanics of earthquakes and faulting: Influence of friction properties and fault material on rupture tip propagation	Amine Ammar, Saber El Arem	LAMPA - Laboratoire angevin de mécanique, procédés et innovation	Angers	lampa.ensam.eu	HESAM Université	saber.elarem@ensam.eu
095	Environment Science and Technology, Sustainable Development, Geosciences, Material science, Mechanics and Fluids		Consequences of climate change on the structural integrity of buried large-diameter water-transmission mains	Humberto Yanez Godoy	I2M - Institut de Mécanique et d'ingénierie	Bordeaux	https://www.i2m.u-bordeaux.fr	Université de Bordeaux	humberto.yanez-godoy@u-bordeaux.fr
063	Information and Communication Science and Technology		Towards the definition of Industry 4.0 and 5.0 Key Performance Indicators	Nathalie Klement, Ali Siadat, Virginie Goepp	LISPEN - Laboratoire d'ingénierie des systčmes physiques et numériques	Lille	https://lispen.ensam.eu/	HESAM Université	nathalie.klement@ensam.eu
068	Information and Communication Science and Technology		A decision aid system based on a decentralized architecture to faster the management of hazards occurring under production and logistics systems	Nathalie Klement, Esma Yahia, Lionel Roucoules	LISPEN - Laboratoire d'ingénierie des systčmes physiques et numériques	Lille	https://lispen.ensam.eu/	HESAM Université	nathalie.klement@ensam.eu
074	Information and Communication Science and Technology		Learning with immersive technologies	Simon Richir, Geoffrey Gorisse, Sylvain Fleury	LAMPA - Laboratoire angevin de mécanique, procédés et innovation	Angers	http://lampa.ensam.eu/	HESAM Université	sylvain.fleury@ensam.eu
046	Information and Communication Science and Technology, Material science, Mechanics and Fluids	Manufacturing Processes, Augmented Reality, Virtual Reality and Mixed Reality	Integrated Virtual Simulation and Visualization of Manufacturing Processes using Numerical Simulation and Augmented Reality	Jose Outeiro, Jean-Rémy Chardonnet	LABOMAP - Laboratoire Bourguignon des matériaux et procédés	Cluny	http://labomap.ensam.eu	HESAM Université	jose.outeiro@ensam.eu
075	Information and Communication Science and Technology, Material science, Mechanics and Fluids, Mathematics and their applications	Nonlinear Dynamics, Intelligent Systems, Micro/Nano Electromechanical Syetems	Analysis, modeling and simulation of parametric resonances of piezoelectric structures. Application to nano-systems and energy harvesting	Olivier Thomas, Christophe Giraud-Audine, Simon Benacchio	LISPEN - Laboratoire d'ingénierie des systčmes physiques et numériques	Lille	https://lispen.ensam.eu/	HESAM Université	jean-francois.deu@lecnam.net
080	Information and Communication Science and Technology, Mathematics and their applications	Computer science, combinatorial algorithms, constraint programming, finite model search, graph theory, cyber-physical systems engineering.	Graph-based unbounded constrained models search for high-level logical reasoning	Jean-Philippe Pernot, Mathias Kleiner	LISPEN - Laboratoire d'ingénierie des systčmes physiques et numériques	Aix-en-Provence	lispen.ensam.eu	HESAM Université	mathias.kleiner@ensam.eu
015	Material science, Mechanics and Fluids	Mechanical Engineering, Computational Mechanics	Development of guidelines tool to prevent the occurrence of plastic buckling in thin structures	Farid Abed-Meraim, Mohamed Ben Bettaieb	LEM3 - Laboratoire d'étude des microstructures et de mécanique des matériaux	Metz	http://www.lem3.univ-lorraine.fr/	HESAM Université	Mohamed.BenBettaieb@ensam.eu
016	Material science, Mechanics and Fluids	Mechanical Engineering, Computational Mechanics	Development of an advanced CPFEM tool for the prediction of formability limits of polycrystalline thin metal sheets	Farid Abed-Meraim, Mohamed Ben Bettaieb	LEM3 - Laboratoire d'étude des microstructures et de mécanique des matériaux	Metz	http://www.lem3.univ-lorraine.fr/	HESAM Université	Mohamed.BenBettaieb@ensam.eu

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017	Material science, Mechanics and Fluids		Development of an advanced numerical tool to predict the bendability limits during sheet metal forming processes	Farid Abed-Meraim, Mohamed Ben Bettaieb	LEM3 - Laboratoire d'étude des microstructures et de mécanique des matériaux	Metz	http://www.lem3.univ-lorraine.fr/	HESAM Université	Mohamed.BenBettaieb@ensam.eu
018	Material science, Mechanics and Fluids	Material science and engineering, Surface treatment, PVD coatings, thermochemical treatment, powder metallurgy, diffusion	Improvement of surface properties by PVD-Thermochemistry hybrid treatment on metal substrates obtained by conventional manufacturing processes and by powder metallurgy	Corinne Nouveau, Dominique Cotton	LABOMAP - Laboratoire Bourguignon des matériaux et procédés	Cluny	labomap.ensam.eu	HESAM Université	corinne.nouveau@ensam.eu
019	Material science, Mechanics and Fluids		Measurement of residual stresses in materials: FEM-based simulation of X-ray diffraction	Dorian Depriester, Laurent Barrallier	MSMP - Laboratoire Mécanique, Surface, Matériaux et Procédés	Aix-en-Provence	https://www.msmp.eu/	HESAM Université	dorian.depriester@ensam.eu
021	Material science, Mechanics and Fluids	Mechanical Engineering, Manufacturing processes, Additive Manufacturing, Machining	Surface integrity of Ti-6Al-4V alloy components produced by SLM and machining processes: multiphysics simulations and experimental validation	Jose Outeiro, Abdelhadi Moufki	LABOMAP - Laboratoire Bourguignon des matériaux et procédés	Cluny	http://labomap.ensam.eu/	HESAM Université	Jose Outeiro
034	Material science, Mechanics and Fluids	Photovotaic	Multiscale stress/strain analysis of polycrystalline silicon for photovoltaic applications	Laurent Barrallier	MSMP - Laboratoire Mécanique, Surface, Matériaux et Procédés	Aix-en-Provence	msmp.eu	HESAM Université	laurent.barrallier@ensam.eu
036	Material science, Mechanics and Fluids		Thermal and mechanical fatigue behavior of selective laser melting maraging steel (H11 or H13)	Nan Kang, Mohamed El Mansori	MSMP - Laboratoire Mécanique, Surface, Matériaux et Procédés	Châlons-en-Champagne	https://www.msmp.eu	HESAM Université	nan.kang@ensam.eu
037	Material science, Mechanics and Fluids		Multi-scaled structure design of thermal controllable complex conforming cooling channel system in selective laser melting process	Mohamed El Mansori, Nan Kang	MSMP - Laboratoire Mécanique, Surface, Matériaux et Procédés	Châlons-en-Champagne	https://www.msmp.eu	HESAM Université	nan.kang@ensam.eu
038	Material science, Mechanics and Fluids		Mechanical and Functional fatigue behavior of selective laser melted NiTi Shape Memory Alloy	Mohamed El Mansori, Mourad El Hadrouz	MSMP - Laboratoire Mécanique, Surface, Matériaux et Procédés	Châlons-en-Champagne	https://www.msmp.eu	HESAM Université	mourad.elhadrouz@ensam.eu
040	Material science, Mechanics and Fluids		Optimized set-up to characterize the contact fatigue damage of material with gradient properties	Jean-Patrick Goulmy, Laurent Barrallier	MSMP - Laboratoire Mécanique, Surface, Matériaux et Procédés	Aix-en-Provence	https://www.msmp.eu/	HESAM Université	jean-patrick.goulmy@ensam.eu
044	Material science, Mechanics and Fluids		Fluid Dynamic Unsteadiness in Multiphase Turbomachinery	Antoine Dazin, Francesco Romano	LMFL - Laboratoire de mécanique des fluides de Lille	Lille	https://lmfl.cnrs.fr/en/home/	HESAM Université	antoine.dazin@ensam.eu
048	Material science, Mechanics and Fluids		Single and Multiple Cavitating Bubbles near a Wall	Francesco Romano, Olivier Coutier-Delgosha, Antoine Dazin	LMFL - Laboratoire de mécanique des fluides de Lille	Lille	https://lmfl.cnrs.fr/en/home/	HESAM Université	francesco.romano@ensam.eu

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061	Material science, Mechanics and Fluids	Mechanical, Material and Process Engineering	Improving formability of lightweight metallic materials using process chaining: Incremental Forming and Friction Stir Welding	Philippe Dal Santo, Idriss Tiba, Sandra Chevret, Tudor Balan	LAMPA - Laboratoire angevin de mécanique, procédés et innovation	Angers	http://lampa.ensam.eu/	HESAM Université	idriss.tiba@ensam.eu
062	Material science, Mechanics and Fluids	Mechanical Engineering	Smart and multiphysics solid-shell finite elements for the simulation of 3D thin structures	Farid Abed-Meraim, Hocine Chalal	LEM3 - Laboratoire d'étude des microstructures et de mécanique des matériaux	Metz	http://www.lem3.univ-lorraine.fr/	HESAM Université	farid.abed-meraim@ensam.eu
064	Material science, Mechanics and Fluids	Mechanical Engineering	Forming limit predictions for porous materials in cold and warm sheet metal forming	Farid Abed-Meraim, Hocine Chalal	LEM3 - Laboratoire d'étude des microstructures et de mécanique des matériaux	Metz	http://www.lem3.univ-lorraine.fr/	HESAM Université	farid.abed-meraim@ensam.eu
073	Material science, Mechanics and Fluids	Mechanical engineering, Computational mechanics, Mechanics of Materials	Development of advanced multiscale computational tools for the multiphysics prediction of Carbon nanotubes (CNTs) fuzzy fiber composites	George Chatzigeorgiou, Fodil Meraghni, Adil Benaarbia	LEM3 - Laboratoire d'étude des microstructures et de mécanique des matériaux	Metz	http://www.lem3.univ-lorraine.fr/	HESAM Université	georges.chatzigeorgiou@ensam.eu
077	Material science, Mechanics and Fluids	Computational mechanics, Nonlinear mechanics, Generalized continua	Efficient computational framework to model size effects in miniaturized products	Farid Abed-Meraim, Mohamed Jebahi	LEM3 - Laboratoire d'étude des microstructures et de mécanique des matériaux	Metz	http://www.lem3.fr	HESAM Université	mohamed.jebahi@ensam.eu
082	Material science, Mechanics and Fluids	Mechanical Engineering, Manufacturing Processes	Sustainability assessment and multi-physical/multi-scale modelling of surface integrity in machining of Inconel 718 superalloy using advanced cutting tools materials	José Outeiro, Hélčne Birembaux, Aurélien Besnard	LABOMAP - Laboratoire Bourguignon des matériaux et procédés	Cluny	http://labomap.ensam.eu/	HESAM Université	jose.outeiro@ensam.eu
098	Material science, Mechanics and Fluids		Phase field modeling of damage and fracture in polycrystalline materials under thermomechanical loading	Amine Ammar, Saber El Arem	LAMPA - Laboratoire angevin de mécanique, procédés et innovation	Angers	http://lampa.ensam.eu/	HESAM Université	saber.elarem@ensam.eu
100	Material science, Mechanics and Fluids		Nonlinear dynamics of cracked structures: aplication to wind turbines	Amine Ammar, Saber El Arem, Adil El Baroudi	LAMPA - Laboratoire angevin de mécanique, procédés et innovation	Angers	lampa.ensam.eu	HESAM Université	saber.elarem@ensam.eu
109	Material science, Mechanics and Fluids		Reconstruction of heterogeneous surface residual-stresses in polycrystalline materials from X-ray diffraction measurements	Chedly Braham, Leo Morin	PIMM - Laboratoire Procédés et ingénierie en mécanique et matériaux	Paris	https://pimm.artsetmetiers.fr/	HESAM Université	chedly.braham@ensam.eu
076	Material science, Mechanics and Fluids, Mathematics and their applications		Multi-scale data-driven modelling of short-fibre reinforced composites for automotive applications	Fodil Meraghni, Francis Praud	LEM3 - Laboratoire d'étude des microstructures et de mécanique des matériaux	Metz	http://www.lem3.fr	HESAM Université	fodil.meraghni@ensam.eu

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003	Biology, Biophysics and Biochemistry, Chemistry, Physical chemistry and Chemical Engineering, Life and Health Science and Technology	Synthetic Chemisty, Medicinal Chemistry	Development of Selective Antibacterial Organometallic Drug Candidates	Gilles Gasser, Kevin Cariou	I-CLEHS - Institute of chemistry for life and health	Paris	http://www.gassergroup.com	Université Paris Sciences et Lettres (PSL)	gilles.gasser@chimieparistech.psl.eu
004	Biology, Biophysics and Biochemistry, Chemistry, Physical chemistry and Chemical Engineering, Life and Health Science and Technology	Photochemistry, Medicinal Chemistry.	Photocatalysis in Living Cells with Earth Abundant Metals for Cancer Therapy	Gilles Gasser	I-CLEHS - Institute of chemistry for life and health	Paris	http://www.gassergroup.com	Université Paris Sciences et Lettres (PSL)	gilles.gasser@chimieparistech.psl.eu
078	Biology, Biophysics and Biochemistry, Chemistry, Physical chemistry and Chemical Engineering, Life and Health Science and Technology		Engineering of Multimodal Magnetic Resonance and optical Imaging using targeted theranostic nanoparticles for diagnosis and therapeutic studies against cancer in preclinics.	Bich-Thuy Doan	I-CLEHS - Institute of chemistry for life and health	Paris	https://www.chimieparistech.psl.eu/recherche/les-laboratoires/i-clehs/	Université Paris Sciences et Lettres (PSL)	bich-thuy.doan@chimieparistech.psl.eu
005	Chemistry, Physical chemistry and Chemical Engineering		Iodoarene Catalysis through Aerobic Photocatalytic and Electrocatalytic Activations.	Kevin Cariou	I-CLEHS - Institute of chemistry for life and health	Paris	http://www.gassergroup.com/	Université Paris Sciences et Lettres (PSL)	kevin.cariou@chimieparistech.psl.eu
023	Chemistry, Physical chemistry and Chemical Engineering	Surface Science, Material Science, Corrosion	Surface treatments of aluminium alloys and corresponding corrosion behavior. Focus on the role of intermetallic particles.	Jolanta Swiatowska, Frédéric Wiame, Philippe Marcus	IRCP - Institut de Recherche de Chimie de Paris	Paris	https://www.ircp.cnrs.fr/le-laboratoire/	Université Paris Sciences et Lettres (PSL)	jolanta.swiatowska@chimieparistech.psl.eu
027	Chemistry, Physical chemistry and Chemical Engineering	Chemistry and Materials Science	Synthesis of Biodegradable Polymers from Renewable Resources	Regis Gauvin, Christophe Thomas	IRCP - Institut de Recherche de Chimie de Paris	Paris	https://www.ircp.cnrs.fr/	Université Paris Sciences et Lettres (PSL)	regis.gauvin@chimieparistech.psl.eu
029	Chemistry, Physical chemistry and Chemical Engineering	Chemistry and Materials Science	Vectorizing nanoparticles using biocompatible and biodegradable polymer coating mediated by surface organometallic chemistry	Regis Gauvin, Christophe Thomas	IRCP - Institut de Recherche de Chimie de Paris	Paris	https://www.ircp.cnrs.fr/	Université Paris Sciences et Lettres (PSL)	regis.gauvin@chimieparistech.psl.eu
031	Chemistry, Physical chemistry and Chemical Engineering	Chemistry and Materials Science	Synthesis of Biobased Polymers from Renewable Resources: A New Tandem Approach	Christophe Thomas, Regis Gauvin	IRCP - Institut de Recherche de Chimie de Paris	Paris	https://www.ircp.cnrs.fr/	Université Paris Sciences et Lettres (PSL)	christophe.thomas@chimieparistech.psl.eu
033	Chemistry, Physical chemistry and Chemical Engineering	Chemistry and Materials Science	Smart multi-catalytic systems for the production of biocompatible polymers	Christophe Thomas, Regis Gauvin	IRCP - Institut de Recherche de Chimie de Paris	Paris	http://www.ircp.cnrs.fr	Université Paris Sciences et Lettres (PSL)	christophe.thomas@chimieparistech.psl.eu
047	Chemistry, Physical chemistry and Chemical Engineering		Environmental behavior of novel multi-principal element alloys containing molybdenum	Dimitri Mercier, Philippe Marcus	IRCP - Institut de Recherche de Chimie de Paris	Paris	https://www.ircp.cnrs.fr/	Université Paris Sciences et Lettres (PSL)	dimitri.mercier@chimieparistech.psl.eu
059	Chemistry, Physical chemistry and Chemical Engineering		Mechanochemistry-assisted continuous catalysis in green solvent	Christophe Len, Carlo Adamo	I-CLEHS - Institute of chemistry for life and health	Paris	https://www.chimieparistech.psl.eu/recherche/les-laboratoires/i-clehs/	Université Paris Sciences et Lettres (PSL)	christophe.len@chimieparistech.pl.eu

File number	Research field	Subfield	Titile	Advisors	Lab	Lab location	Lab website	Doctorate awarded by	Contact point
110	Chemistry, Physical chemistry and Chemical Engineering	Organic Chemistry, Catalysis	Asymmetric Catalysis toward BioRelevant Architecturally Novel Natural and Unnatural Products	Virginie Vidal, Phannarath Phansavath	I-CLEHS - Institute of chemistry for life and health	Paris	https://iclehs.fr/	Université Paris Sciences et Lettres (PSL)	virginie.vidal@chimieparistech.psl.eu
071	Chemistry, Physical chemistry and Chemical Engineering, Energy, Processes		Plastics Conversion in Molten Salts	Vincent Semetey, Virginie Lair	IRCP - Institut de Recherche de Chimie de Paris	Paris	https://www.ircp.cnrs.fr	Université Paris Sciences et Lettres (PSL)	vincent.semetey@chimieparistech.psl.eu; virginie.lair@chimieparistech.psl.eu
108	Chemistry, Physical chemistry and Chemical Engineering, Energy, Processes	Surface Science, Material Science, Battery, Energy Storage and Conversion	Surface reactivity of Mg anode in high-energy density Mg-air battery	Jolanta Swiatowska	IRCP - Institut de Recherche de Chimie de Paris	Paris	https://www.ircp.cnrs.fr/	Université Paris Sciences et Lettres (PSL)	jolanta.swiatowska@chimieparistech.psl.eu
030	Chemistry, Physical chemistry and Chemical Engineering, Energy, Processes, Environment Science and Technology, Sustainable Development, Geosciences		2D/3D Perovskites for Stable and High-Efficiency Solar Cells	Thierry Pauporté	IRCP - Institut de Recherche de Chimie de Paris	Paris	https://www.chimieparistech.psl.eu/recherche/les-laboratoires/ircp/	Université Paris Sciences et Lettres (PSL)	thierry.pauporte@chimie-paristech.fr
051	Chemistry, Physical chemistry and Chemical Engineering, Energy, Processes, Physics, Optics	Theoretical and Computational Chemistry	In-silico design of improved electron acceptors for organic photovoltaic applications	Carlo Adamo	I-CLEHS - Institute of chemistry for life and health	Paris	http://www.iclehs.fr	Université Paris Sciences et Lettres (PSL)	carlo.adamo@chimieparistech.psl.eu
011	Chemistry, Physical chemistry and Chemical Engineering, Life and Health Science and Technology	Theoretical Chemistry	Design of new photoactivable systems using theoretical approaches	Ilaria Ciofini	I-CLEHS - Institute of chemistry for life and health	Paris	https://iclehs.fr/	Université Paris Sciences et Lettres (PSL)	ilaria.ciofini@chimieparistech.psl.eu
056	Chimeistry, Physical chemistry and Chemical Engineering, Life and Health Science and Technology		Mechanochemistry-Assisted Continuous Synthesis of Organometallic Complexes of Medicinal Relevance	Christophe Len, Kevin Cariou, Gilles Gasser	I-CLEHS - Institute of chemistry for life and health	Paris	https://www.chimieparistech.psl.eu/recherche/les-laboratoires/i-clehs/	Université Paris Sciences et Lettres (PSL)	christophe.len@chimieparistech.psl.eu
079	Chemistry, Physical chemistry and Chemical Engineering, Life and Health Science and Technology		Continuum solvation for extended periodic systems	Frederic Labat, Carlo Adamo	I-CLEHS - Institute of chemistry for life and health	Paris	https://iclehs.fr	Université Paris Sciences et Lettres (PSL)	frederic.labat@chimieparistech.psl.eu
083	Chemistry, Physical chemistry and Chemical Engineering, Material science, Mechanics and Fluids		Recycling polyurethane using	Vincent Semetey	IRCP - Institut de Recherche de Chimie de Paris	Paris	https://www.ircp.cnrs.fr	Université Paris Sciences et Lettres (PSL)	vincent.semetey@chimieparistech.psl.eu
053	Chemistry, Physical chemistry and Chemical Engineering, Physics, Optics	Theoretical and Computational Chemistry	Modeling Proton Transfer Reactions with Biased Ab-initio Dynamics	Carlo Adamo	I-CLEHS - Institute of chemistry for life and health	Paris	http://www.iclehs.fr	Université Paris Sciences et Lettres (PSL)	Carlo, Adamo, carlo.adamo@chimieparistech.psl.eu

PHD PROPOSALS – ECOLE DES PONTS PARISTECH

File number	Research field	Subfield	Titile	Advisors	Lab	Lab location	Lab website	Doctorate awarded by	Contact point
084	Environment Science and Technology, Sustainable Development, Geosciences		Spatio-temporal variability of rainfall drop size distribution across scales: retrieval, characterization and uses	Ioulia Tchiguirinskaia, Auguste Gires	HM & Co - Hydrologie Météorologie et Complexité	Champs-sur-Marne	hmco.enpc.fr/	Ecole des Ponts ParisTech	ioulia.tchiguirinskaia@enpc.fr; auguste.gires@enpc.fr
096	Environment Science and Technology, Sustainable Development, Geosciences	Hydrology	Optimal implementation of Nature-Based Solutions to mitigate Urban Heat Islands	Pierre-Antoine Versini	HM & Co - Hydrologie Météorologie et Complexité	Champs-sur-Marne	https://hmco.enpc.fr/	Ecole des Ponts ParisTech	pierre-antoine.versini@enpc.fr
097	Environment Science and Technology, Sustainable Development, Geosciences		Develop an innovative framework to assess the environmental performances of a new train station over time	Pierre-Antoine Versini	HM & Co - Hydrologie Météorologie et Complexité	Champs-sur-Marne	https://hmco.enpc.fr/	Ecole des Ponts ParisTech	pierre-antoine.versini@enpc.fr
009	Environment Science and Technology, Sustainable Development, Geosciences, Material science, Mechanics and Fluids	Civil Engineering - Construction	Controlling hygrothermics of biobased construction material	Philippe Coussot, Patrick Huber	Laboratoire NAVIER (mécanique, physique des matériaux et des structures, géotechnique)	Champs-sur-Marne	https://navier-lab.fr/en/	Ecole des Ponts ParisTech	philippe.coussot@univ-eiffel.fr
010	Material science, Mechanics and Fluids		Gas transfer in the compacted bentonite-based materials	Yujun Cui	Laboratoire NAVIER (mécanique, physique des matériaux et des structures, géotechnique)	Champs-sur-Marne	https://navier-lab.fr/	Ecole des Ponts ParisTech	yu-jun.cui@enpc.fr

File number	Research field	Subfield	Titile	Advisors	Lab	Lab location	Lab website	Doctorate awarded by	Contact point
111	Biology, Biophysics and Biochemistry, Life and Health Science and Technology	Neurosciences, Neuropathology	Interactions between the circadian and dopaminergic systems in Parkinson disease studied in Drosophila	Birman Serge	Plasticité du cerveau	Paris	https://www.bio.espci.fr/-Home-	Université Paris Sciences et Lettres (PSL)	serge.birman@espci.fr
049	Biology, Biophysics and Biochemistry, Material science, Mechanics and Fluids, Physics, Optics	Theoretical biophysics	A mechano-chemical model of hydra morphogenesis	Philippe Marcq	Physique et mécanique des Milieux Hétérogčnes	Paris	https://www.pmmh.espci.fr/	Université Paris Sciences et Lettres (PSL)	philippe.marcq@espci.fr
001	Chemistry, Physical chemistry and Chemical Engineering		Asymmetric multicomponent reactions in continuous-flow	Benjamin Laroche	C3M - Chimie Moléculaire, Macromoléculaire, et Matériaux	Paris	https://www.cmc.espci.fr/Dr-Benjamin-Laroche	Université Paris Sciences et Lettres (PSL)	benjamin.laroche@espci.fr
028	Chemistry, Physical chemistry and Chemical Engineering		Using good vibrations to decrease the viscosity of non brownian suspensions.	Annie Colin	CBI - Chimie, Biologie et Innovation	Paris	https://www.cbi.espci.fr/accueil-22/	Université Paris Sciences et Lettres (PSL)	annie.colin@espci.fr
008	Chemistry, Physical chemistry and Chemical Engineering, Energy, Processes, Material science, Mechanics and Fluids		Efficient and Stable Semi-Transparent Perovskite Solar Cells	Zhuoying Chen, Lionel Aigouy	LPEM - Laboratoire Physique et d'études des matériaux	Paris	https://www.lpem.espci.fr	Université Paris Sciences et Lettres (PSL)	zhuoying.chen@espci.fr; lionel.aigouy@espci.fr
042	Chemistry, Physical chemistry and Chemical Engineering, Energy, Processes, Material science, Mechanics and Fluids, Physics, Optics		Nanoparticles, Nanowire, and Nanosheets of Hybrid Perovskite Halides: From Synthesis to Applications	Zhuoying Chen, Alexei Chepelianskii, Miguel Monteverde	LPEM - Laboratoire Physique et d'études des matériaux	Paris	https://www.lpem.espci.fr	Université Paris Sciences et Lettres (PSL)	zhuoying.chen@espci.fr; alexei.chepelianskii@universite-paris-saclay.fr
022	Chemistry, Physical chemistry and Chemical Engineering, Material science, Mechanics and Fluids, Physics, Optics		Active Colloidal Gels	Olivier Dauchot	GULLIVER - Voyages expérimentaux et théoriques en matičre molle	Paris	https://www.gulliver.espci.fr	Université Paris Sciences et Lettres (PSL)	olivier.dauchot@espci.fr
025	Energy, Processes, Material science, Mechanics and Fluids		Entrance effects in osmotic nanofluidics for Blue Energy	Corentin Trégouët, Annie Colin	CBI - Chimie, Biologie et Innovation	Paris	http://www.cbi.espci.fr/accueil-22/	Université Paris Sciences et Lettres (PSL)	annie.colin@espci.fr
007	Material science, Mechanics and Fluids, Physics, Optics	condensed matter physics, spintronic	Novel two dimensional Rashba materials for spintronics.	Nicolas Bergeal, Sergio Vlaic	LPEM - Laboratoire Physique et d'études des matériaux	Paris	https://www.lpem.espci.fr/spip.php?rubrique45&lang=fr	Université Paris Sciences et Lettres (PSL)	sergio.vlaic@espci.fr
041	Material science, Mechanics and Fluids, Physics, Optics	Condensed matter physics	Hydrodynamics of electrons and phonons in bulk semimetals	Kamran Behnia	LPEM - Laboratoire Physique et d'études des matériaux	Paris	https://www.lpem.espci.fr/spip.php?rubrique4	Université Paris Sciences et Lettres (PSL)	kamran.behnia@gmail.com

File number	Research field	Subfield	Titile	Advisors	Lab	Lab location	Lab website	Doctorate awarded by	Contact point
058	Material science, Mechanics and Fluids, Physics, Optics		Bad metals and soft mode in the quantum paralectrics	Benoit Fauqué, Philippe Bourges	LPEM - Laboratoire Physique et d'études des matériaux	Paris	https://www.lpem.espci.fr/spip.php?rubrique4	Université Paris Sciences et Lettres (PSL)	benoit.fauque@espci.fr
060	Material science, Mechanics and Fluids, Physics, Optics		lectronic and Thermoelectrical properties of dilute metals	Benoit Fauqué, Kamran Behnia	LPEM - Laboratoire Physique et d'études des matériaux	Paris	https://www.lpem.espci.fr/spip.php?rubrique4	Université Paris Sciences et Lettres (PSL)	benoit.fauque@espci.fr
087	Material science, Mechanics and Fluids, Physics, Optics	Applied Physics, Physical acoustics	ULTRASONIC IMAGING OF SOFT GRANULAR MATERIALS AND BIOMEDICAL APPLICATIONS	Xiaoping Jia, Jean-Luc Gennisson	Institut Langevin	Paris	https://www.institut-langevin.espci.fr	Université Paris Sciences et Lettres (PSL)	xiaoping.jia@espci.fr
091	Material science, Mechanics and Fluids, Physics, Optics		Active liquid crystals: Controlling active flows through "smart confinement"	Teresa Lopez-Leon	GULLIVER - Voyages expérimentaux et théoriques en matičre molle	Paris	https://www.gulliver.espci.fr/	Université Paris Sciences et Lettres (PSL)	teresa.lopez-leon@espci.fr
104	Material science, Mechanics and Fluids, Physics, Optics	Nanomecanics, Interfaces, Ionic Double Layer	Nano-Rheology of Charged Solid/Liquid Interfaces	Jean Comtet	SIMM - Sciences et ingénierie de la matičre molle	Paris	https://www.simm.espci.fr/-Home-.html	Université Paris Sciences et Lettres (PSL)	jean.comtet@espci.fr
105	Material science, Mechanics and Fluids, Physics, Optics	Solid/Liquid Interfaces, Single Molecule Localization Microscopy, 2D materials, Defects	Ionic transport at solid/liquid interfaces at the single charge scale	Jean Comtet	SIMM - Sciences et ingénierie de la matičre molle	Paris	https://www.simm.espci.fr/-Home-.html	Université Paris Sciences et Lettres (PSL)	jean.comtet@espci.fr
107	Material science, Mechanics and Fluids, Physics, Optics	Polymer, Interfaces, Single Molecule Techniques	Single Molecule Investigation of Polymer Chain Dynamics at Interfaces	Jean Comtet	SIMM - Sciences et ingénierie de la matičre molle	Paris	https://www.simm.espci.fr/-Home-.html	Université Paris Sciences et Lettres (PSL)	jean.comtet@espci.fr
024	Physics, Optics	Mechanical and Electronic Engineering	Morphological Swarm Robotics	Olivier Dauchot	GULLIVER - Voyages expérimentaux et théoriques en matičre molle	Paris	https://www.gulliver.espci.fr	Université Paris Sciences et Lettres (PSL)	olivier.dauchot@espci.fr
088	Physics, Optics		Physics and algorithms for molecular modeling	Anthony Maggs	GULLIVER - Voyages expérimentaux et théoriques en matičre molle	Paris	https://www.gulliver.espci.fr/?-home-&lang=en	Université Paris Sciences et Lettres (PSL)	anthony.maggs@espci.fr

PHD PROPOSALS – INSTITUT D'OPTIQUE GRADUATE SCHOOL

File number	Research field	Subfield	Titile	Advisors	Lab	Lab location	Lab website	Doctorate awarded by	Contact point
057	Biology, Biophysics and Biochemistry, Physics, Optics		Polarization sensitive single particle tracking and super-resolution microscopy in the near-infrared for brain imaging	Laurent Cognet	LP2N - Laboratoire Photonique, numérique et nanosciences	Bordeaux	https://www.lp2n.institutoptique.fr/en/teams/nanobiomicroscopy	Université de Bordeaux	laurent.cognet@u-bordeaux.fr
069	Information and Communication Science and Technology, Physics, Optics	Image processing - Microscopy	Improving super-resolved localization microscopes (PALM) in deep and heterogeneous samples with co-designed optimal phase masks	François Goudail	Laboratoire Charles Fabry	Palaiseau	https://www.lcf.institutoptique.fr/	Université Paris-Saclay	francois.goudail@institutoptique.rf
002	Physics, Optics		Production of new striking visual appearance with disordered metasurfaces composed of random arrays of resonant nanoparticles.	Philippe Lalanne	LP2N - Laboratoire Photonique, numérique et nanosciences	Bordeaux	https://www.lp2n.institutoptique.fr	Université de Bordeaux	Philippe.lalanne@institutoptique.fr
006	Physics, Optics		Dissipative strong coupling with non-Hermitian nanoresonators.	Philippe Lalanne	LP2N - Laboratoire Photonique, numérique et nanosciences	Bordeaux	https://www.lp2n.institutoptique.fr	Université de Bordeaux	Philippe.lalanne@institutoptique.fr
020	Physics, Optics		High-power versatile GHz frequency combs for spectral and temporal domains applications	Eric Cormier, Giorgio Santarelli	LP2N - Laboratoire Photonique, numérique et nanosciences	Bordeaux	https://www.lp2n.institutoptique.fr/en	Université de Bordeaux	giorgio.santarelli@institutoptique.fr
070	Physics, Optics		High sensitive Atom Interferometry using multi-photon interrogation in an optical cavity	Benjamin Canuel, Philippe Bouyer	LP2N - Laboratoire Photonique, numérique et nanosciences	Bordeaux	https://www.lp2n.institutoptique.fr/	Université de Bordeaux	Benjamin.canuel@institutoptique.fr
072	Physics, Optics	lasers	development of UV laser sources for applications in quantum physics	Adčle Hilico, Giorgio Santarelli	LP2N - Laboratoire Photonique, numérique et nanosciences	Bordeaux	https://www.lp2n.institutoptique.fr/	Université de Bordeaux	adele.hilico@institutoptique.fr
090	Physics, Optics	Quantum optics	Coherent dipole-dipole coupling of quantum emitters and manipulation of their degree of entanglement	Brahim Lounis, Jean-Baptiste Trebbia	LP2N - Laboratoire Photonique, numérique et nanosciences	Bordeaux	https://sites.google.com/site/bordeauxnanophotonicsgroup/home	Université de Bordeaux	brahim.lounis@u-bordeaux.fr
092	Physics, Optics	Nanophysics	Exploring the optical properties of perovskite single nanocrystals and superlattices	Brahim Lounis, Philippe Tamarat	LP2N - Laboratoire Photonique, numérique et nanosciences	Bordeaux	https://sites.google.com/site/bordeauxnanophotonicsgroup/home	Université de Bordeaux	brahim.lounis@u-bordeaux.fr
093	Physics, Optics	Superconductivity	Fast Josephson-junction control by optical manipulation of a flux quantum	Brahim Lounis, Philippe Tamarat	LP2N - Laboratoire Photonique, numérique et nanosciences	Bordeaux	https://sites.google.com/site/bordeauxnanophotonicsgroup/home	Université de Bordeaux	brahim.lounis@u-bordeaux.fr

LABS AND PROPOSALS' PRESENTATION PRESENT DURING THE WEBINAR

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4. Labs and PhD proposals

SALLE 1 / LIFESCIENCE + ENVIRONMENT SCIENCE

November 9 2021

File number	School	Title	Advisors	Lab
2021_099	AgroParisTech	Top-down Regulation of Olfactory Sensitivity in the Insect Brain	Abhishek Chatterjee, Sylvia Anton	IEES Paris - Institut d'Ecologie et des Sciences de l'Environnement de Paris
2021_050	AgroParisTech	Deciphering the periolfactome of a pest species	Martine Maďbčche, Thomas Chertemps	IEES Paris - Institut d'Ecologie et des Sciences de l'Environnement de Paris
2021_059	Chimie ParisTech - PSL	Mechanochemistry-assisted continuous catalysis in green solvent	Christophe Len, Carlo Adamo	I-CLEHS - Institute of chemistry for life and health
2021_110	Chimie ParisTech - PSL	Asymmetric Catalysis toward BioRelevant Architecturally Novel Natural and Unnatural Products	Virginie Vidal, Phannarath Phansavath	I-CLEHS - Institute of chemistry for life and health
2021_003	Chimie ParisTech - PSL	Development of Selective Antibacterial Organometallic Drug Candidates	Gilles Gasser, Kevin Cariou	I-CLEHS - Institute of chemistry for life and health
2021_004	Chimie ParisTech - PSL	Photocatalysis in Living Cells with Earth Abundant Metals for Cancer Therapy	Gilles Gasser	I-CLEHS - Institute of chemistry for life and health
2021_078	Chimie ParisTech - PSL	Engineering of Multimodal Magnetic Resonance and optical Imaging using targeted theranostic nanoparticles for diagnosis and therapeutic studies against cancer in preclinics.	Bich-Thuy Doan	I-CLEHS - Institute of chemistry for life and health
2021_051	Chimie ParisTech - PSL	In-silico design of improved electron acceptors for organic photovoltaic applications	Carlo Adamo	I-CLEHS - Institute of chemistry for life and health
2021_011	Chimie ParisTech - PSL	Design of new photoactivable systems using theoretical approaches	Ilaria Ciofini	I-CLEHS - Institute of chemistry for life and health
2021_056	Chimie ParisTech - PSL	Mechanochemistry-Assisted Continuous Synthesis of Organometallic Complexes of Medicinal Relevance	Christophe Len, Kevin Cariou, Gilles Gasser	I-CLEHS - Institute of chemistry for life and health
2021_079	Chimie ParisTech - PSL	Continuum solvation for extended periodic systems	Frederic Labat, Carlo Adamo	I-CLEHS - Institute of chemistry for life and health
2021_053	Chimie ParisTech - PSL	Modeling Proton Transfer Reactions with Biased Ab-initio Dynamics	Carlo Adamo	I-CLEHS - Institute of chemistry for life and health

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File number	School	Title	Advisors	Lab
2021_049	ESPCI Paris - PSL	A mechano-chemical model of hydra morphogenesis	Philippe Marcq	Physique et mécanique des Milieux Hétérogčnes
2021_111	ESPCI Paris - PSL	Interactions between the circadian and dopaminergic systems in Parkinson disease studied in Drosophila	Birman Serge	Plasticité du cerveau
2021_067	Arts et Métiers	Modeling of metal nanoparticles embedded in viscoelastic media using fluid-structure interaction approach	Adil El Baroudi, Jean Yves Le Pommellec, Amine Ammar	LAMPA - Laboratoire angevin de mécanique, procédés et innovation
2021_032	Arts et Métiers	The mechanics of earthquakes and faulting: Influence of friction properties and fault material on rupture tip propagation	Amine Ammar, Saber El Arem	LAMPA - Laboratoire angevin de mécanique, procédés et innovation
2021_084	Ecole des Ponts ParisTech	Spatio-temporal variability of rainfall drop size distribution across scales: retrieval, characterization and uses	Ioulia Tchiguirinskaia, Auguste Gires	HM & Co - Hydrologie Météorologie et Complexité
2021_096	Ecole des Ponts ParisTech	Optimal implementation of Nature-Based Solutions to mitigate Urban Heat Islands	Pierre-Antoine Versini	HM & Co - Hydrologie Météorologie et Complexité
2021_097	Ecole des Ponts ParisTech	Develop an innovative framework to assess the environmental performances of a new train station over time	Pierre-Antoine Versini	HM & Co - Hydrologie Météorologie et Complexité
2021_089	MINES ParisTech - PSL	Artificial ground freezing : from laboratory experiments development to in-situ scale predictions	Ahmed Rouabhi, Emad Jahangir	GEOSCIENCES - Centre de Géosciences
2021_005	Chimie ParisTech - PSL	Iodoarene Catalysis through Aerobic Photocatalytic and Electrocatalytic Activations.	Kevin Cariou	I-CLEHS - Institute of chemistry for life and health

PARISTECH – CSC PHD PROGRAM

HYDROLOGY METEOROLOGY AND COMPLEXITY LABORATORY

RESEARCH AT
LABORATORY OF HYDROLOGY METEOROLOGY & COMPLEXITY

- **Physics of heterogeneity:** stochastic multifractals; intermittency; Big Data & AI
- **Hydro-meteorological risks:** multi-scale observations & high resolution urban hydrology
- **Resilient city:** complex systems; Nature Based Solutions & climate mitigation

Ioulia TCHIGUIRINSKAIA, *Research director*

Auguste GIRES, *Associate professor*

- **PhD TITLE:** SPATIO-TEMPORAL VARIABILITY OF RAINFALL DROP SIZE DISTRIBUTION ACROSS SCALES: RETRIEVAL, CHARACTERIZATION AND USES

Pierre Antoine VERSINI, *Associate professor*

- **PhD TITLE:** OPTIMAL IMPLEMENTATION OF NATURE-BASED SOLUTIONS TO MITIGATE URBAN HEAT ISLANDS
- **PhD TITLE:** DEVELOP AN INNOVATIVE FRAMEWORK TO ASSESS THE ENVIRONMENTAL PERFORMANCES OF A NEW TRAIN STATION OVER TIME

Elements of the platform FRESNEL (Co-Innovation Lab):
Blue Green Wave, RadX & SaaS, TARANIS, Multi-Hydro+, with a general view of the experimental site
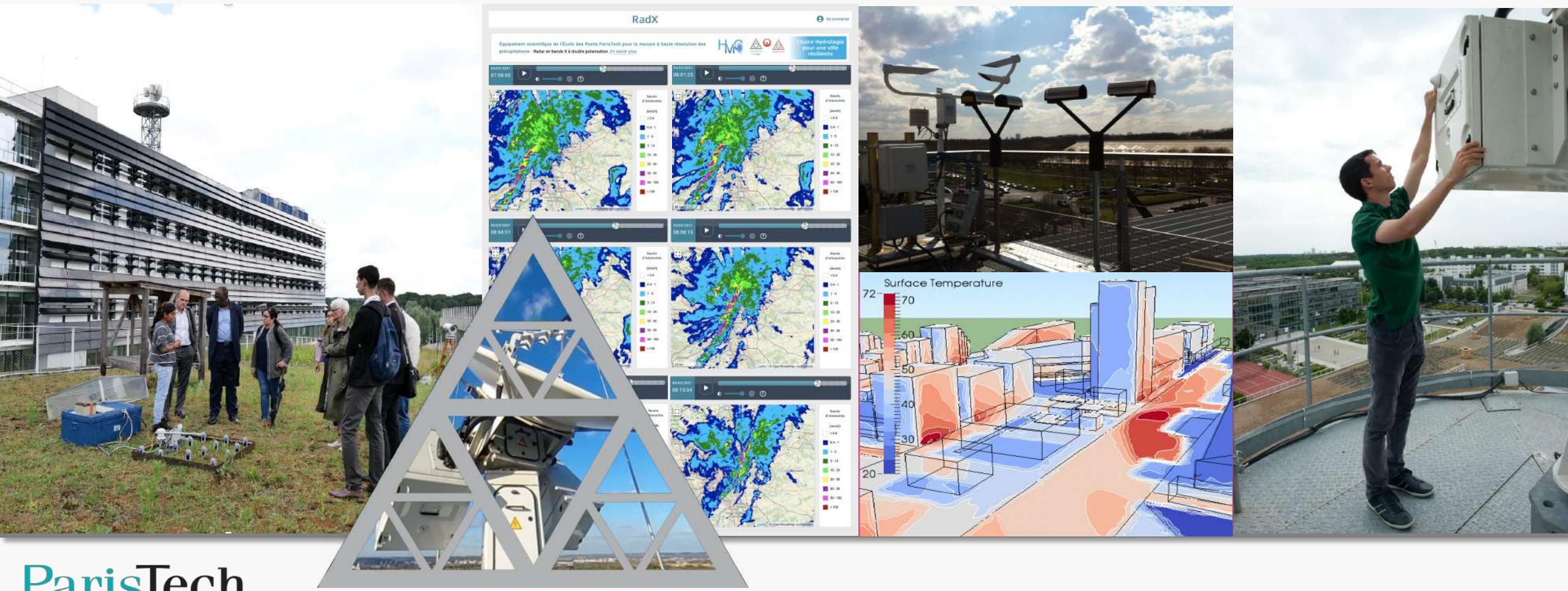
PhD Proposal : Spatio-temporal variability of rainfall drop size distribution (DSD) across scales: retrieval, characterization and uses

Weather radars : the only device providing spatio-temporal insight

Rainfall is extremely variable in space and time : complex analysis and even measurement

DSD maps
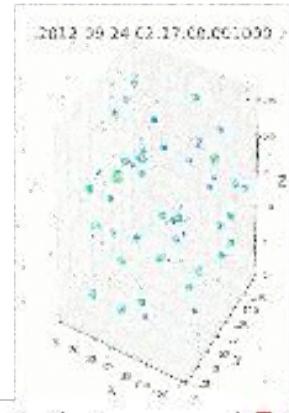
Existing knowledge in time

Improvement of rainfall retrieval algorithms

Quantification of DSD spatio-temporal variability (Multifractal framework)
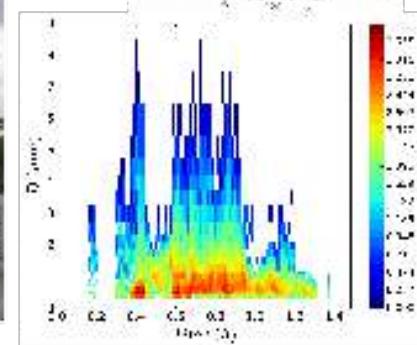
PhD Proposal : Optimal implementation of Nature-Based Solutions to mitigate Urban Heat Islands

Urban Heat Island

Source: Meteo France

Vegetated areas

Source : APUR, 2010

PhD Proposal : Develop an innovative framework to assess the environmental performances of a new train station over time
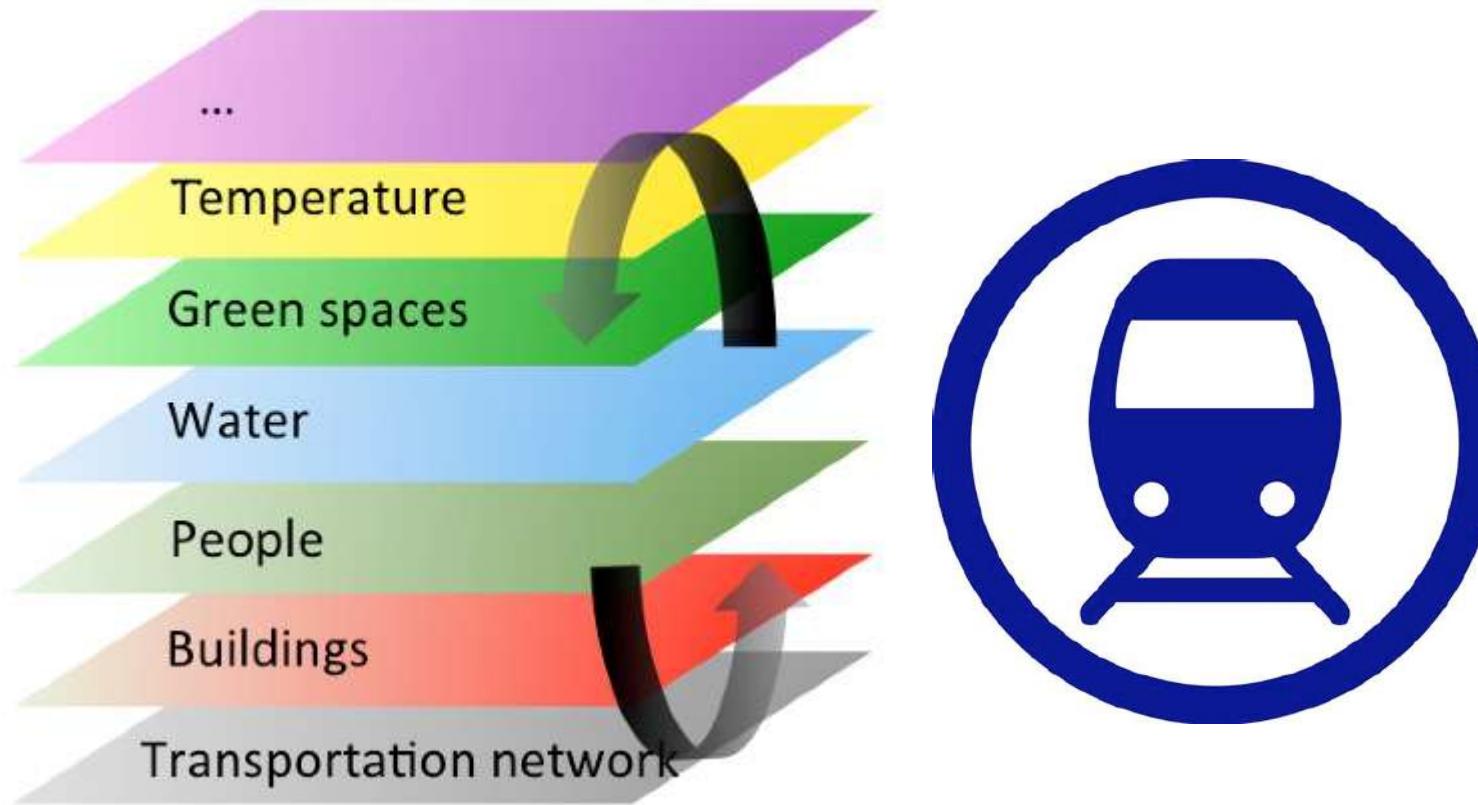
Numerous interactions between the **geophysical fields** (temperature, precipitation…), **urban form** (transport network, planning and green spaces) and **human flows**,

High space-time variability

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ParisTech – CSC PhD Program

Mines ParisTech

Centre de Géosciences

Key facts

Geosciences department
~120 people + short courses
~ 45 researchers
~ 45 Ph.D.

~100 international publications/year

9 M€ contracts with companies

Close interaction with the industry:
- 45% revenue from contracts with the industry

De Beers — A DIAMOND IS FOREVER

Total

eDF

Shell

ANDRA

Air Liquide

GEOSTOCK ENTREPOSE

And many more...

Research teams	Main research fields	
Geology	Continental system dynamics	C. Mehl
Geophysics	Seismic imagery of the subsurface	H. Chauris
Geostatistics	Development and application of geostatistical methods	X. Freulon
Hydrogeology	Water resources, aquifers, geothermy	N. Flipo
Geochimistry	Geochemistry, Reactive transport in porous media	**V. Lagneau (Head of departement)**
Geomechanics	Underground exploitations, THM coupled process in Geomechanics	H. Sellami

Aims:

- behavior of geomaterials

- Structure calculation for the underground space

- Interaction structure-geomaterials

Method: experiments, modelling, simulation
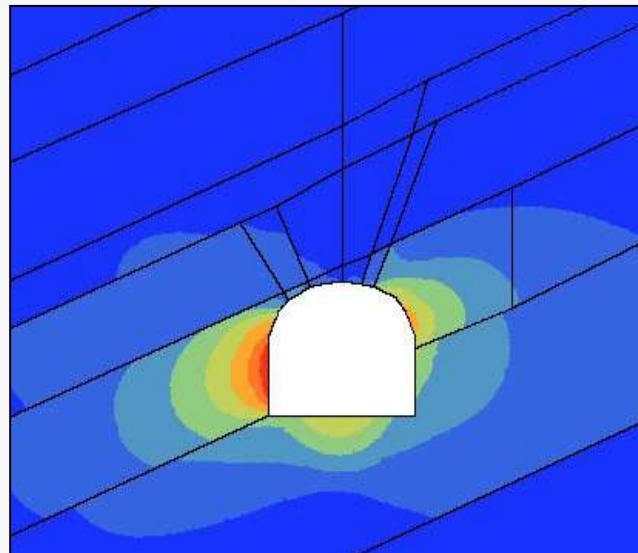
Stability of a reinforced cavity in fracture rocks
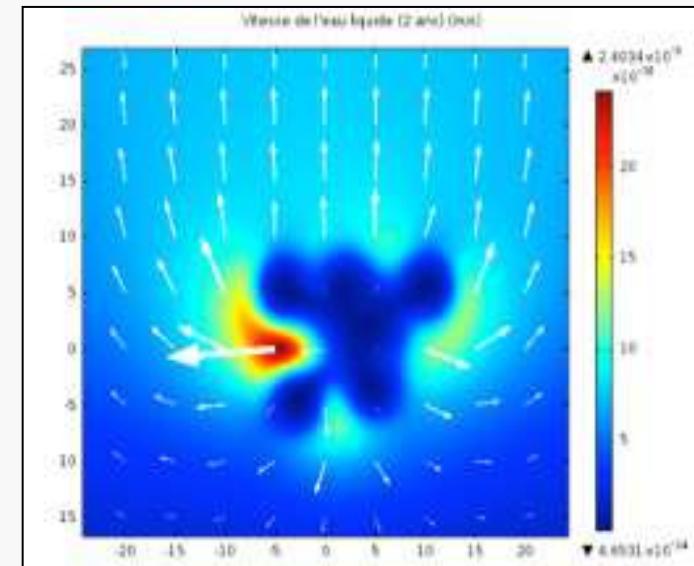
Rock freezing: progression of the front, water induced flow

Application example :
- energy storage

CH4, compressed air

❑ Objectives
- Massive storage of energy
- Optimal security
- No impact at the surface

❑ Methods: numerical simulation tools development
- Environmental impacts
- Multiphysics systems
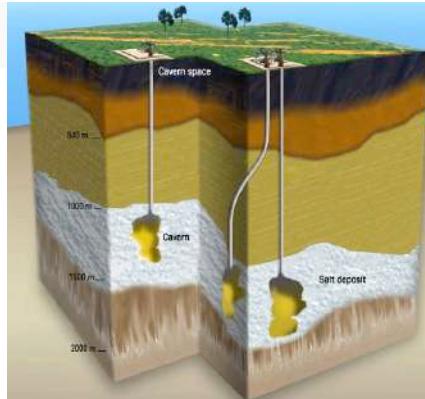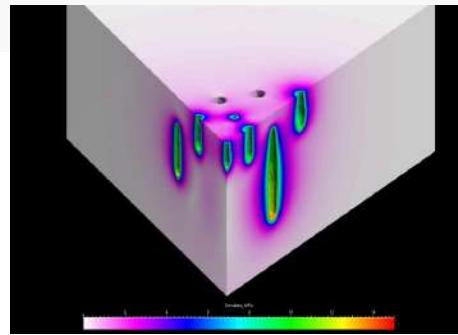
Natural gas in salt cavities

- rock drilling

❑ Mechanical behavior of the drill strings
❑ Rock-tool interaction

Rock-cutter
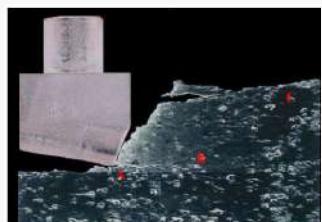
Directional drilling systems
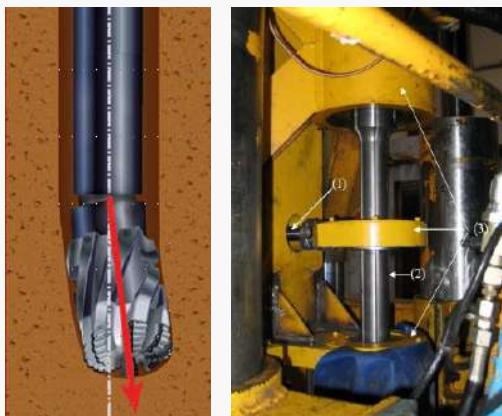
Predictability of performances
(trajectory, speed, stability, integrity)
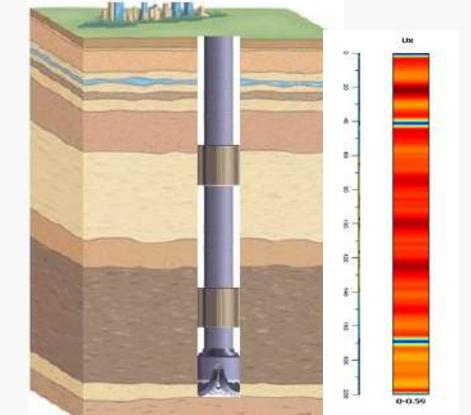
GEOMECHANICS AND ENGINEERING GEOLOGY

Experimental capacity

- Usual characterization methods in the geosciences
- Special devices

Artificial ground freezing
(thermo-mechanical) test

Creep laboratory
(salt)

Drilling laboratory
Pau (SW of France)

PhD topic: Artificial ground freezing: From laboratory experiment developments to in-situ scale predictions

How to impose the in-situ thermo-mechanical stress path in laboratory scale to obtain more realistic behavior of frozen soils ?
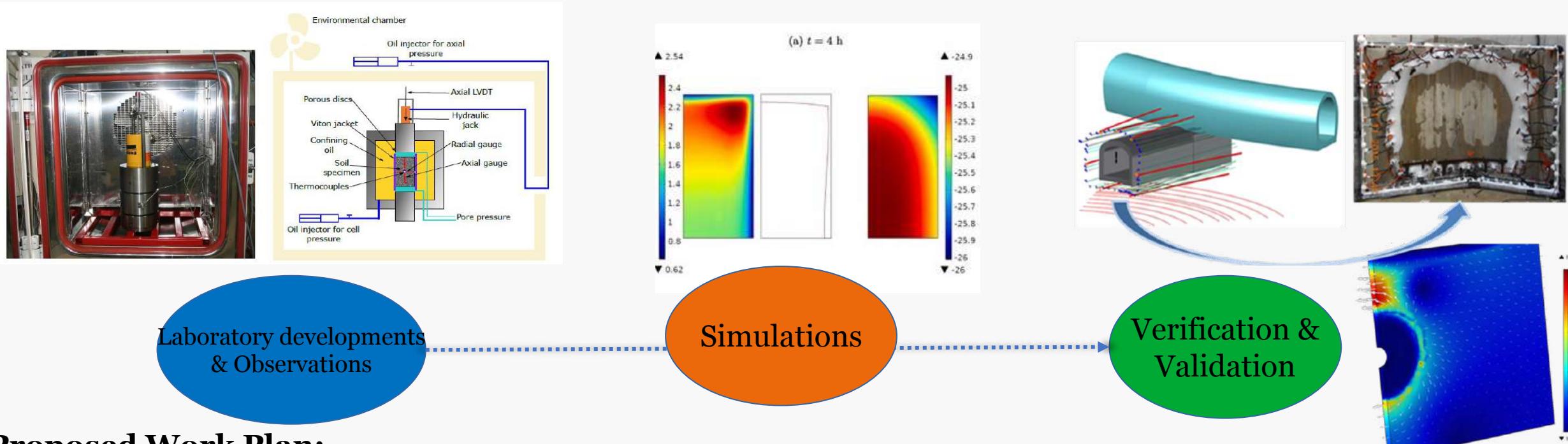
Proposed Work Plan:
- Improvement of the laboratory test (freezing process from inside towards the outside of the sample)
- Improvement of the existent constitutive model formulation and its integration into a numerical finite element code.

Fontainebleau – 65 km South of Paris
a MINES ParisTech campus ~200 people
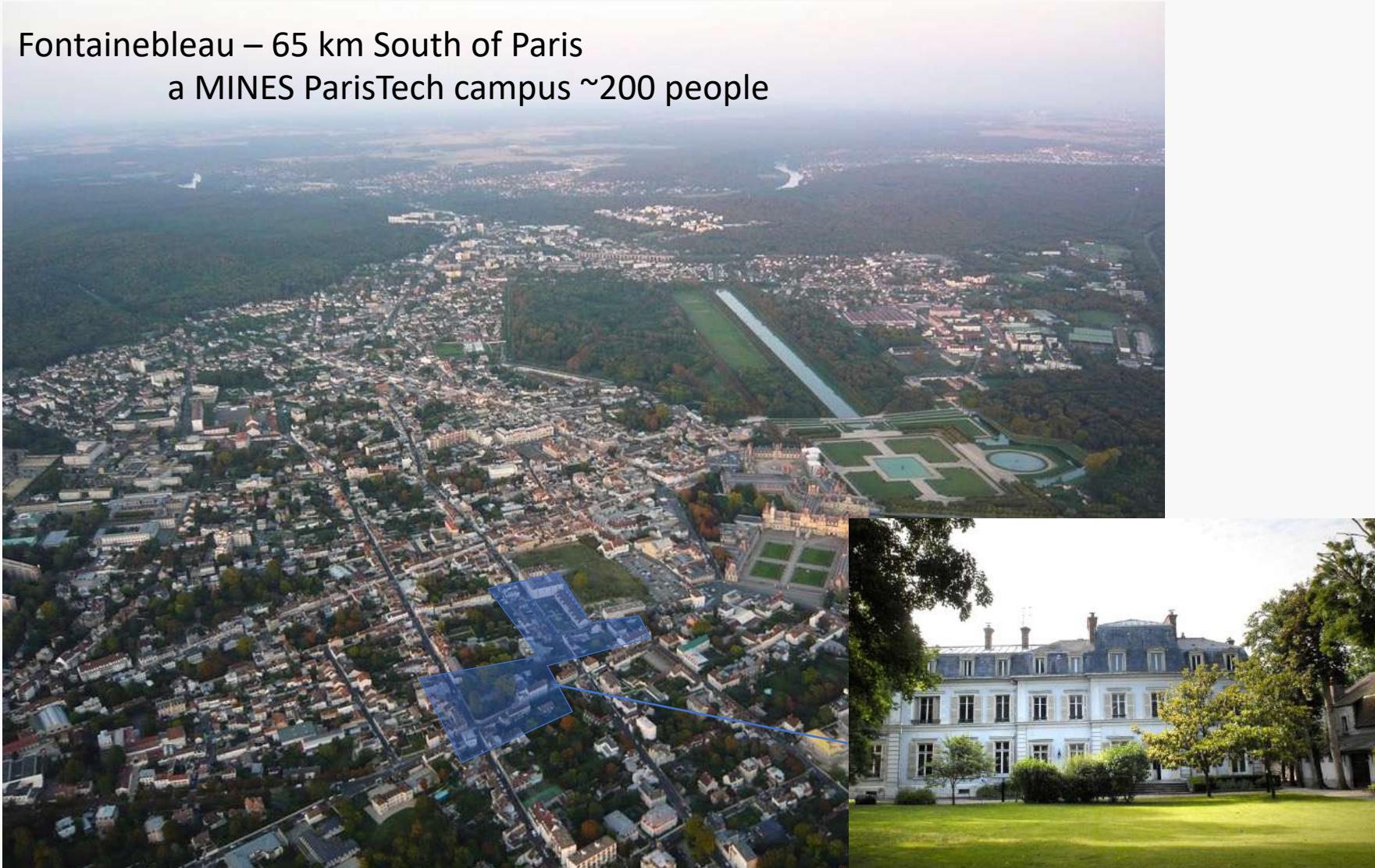
https://www.geosciences.minesparis.psl.eu/

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PARISTECH – CSC PHD PROGRAM

AgroParisTech
Talents for a sustainable planet

INSTITUTE OF ECOLOGY AND ENVIRONMENTAL SCIENCES OF PARIS

SENSORY ECOLOGY DEPARTMENT

PhD PROJECT
DECIPHERING THE "PERIOLFACTOME" OF AN INSECT PEST SPECIES

Martine MAIBECHE

Thomas CHERTEMPS
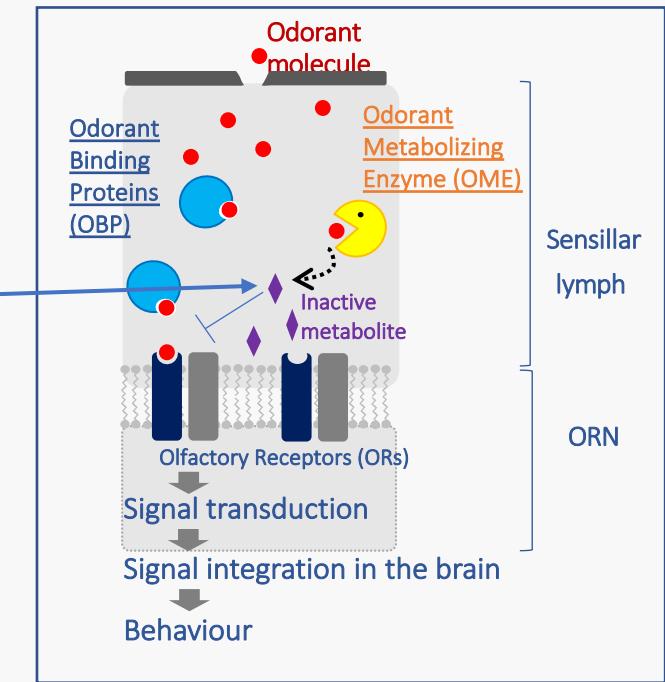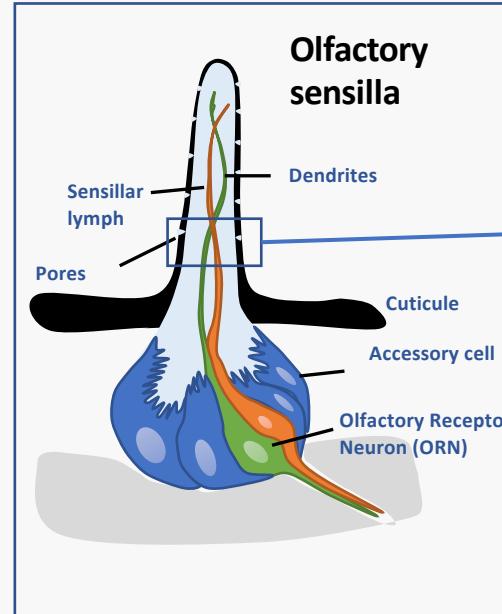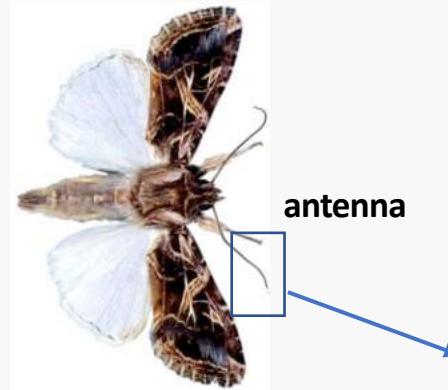
- *RNAseq, functional studies (RNAi, electrophysiology and behavior, heterologous expression)*
- *Basic and applied research in pest control*

PhD project
Top-down Regulation of Olfactory Sensitivity in the Insect Brain

Abhishek
CHATTERJE

Sylvia
ANTON

Crz+ neurons
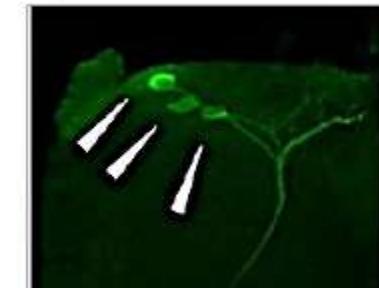
recording from antennal lobe neurons
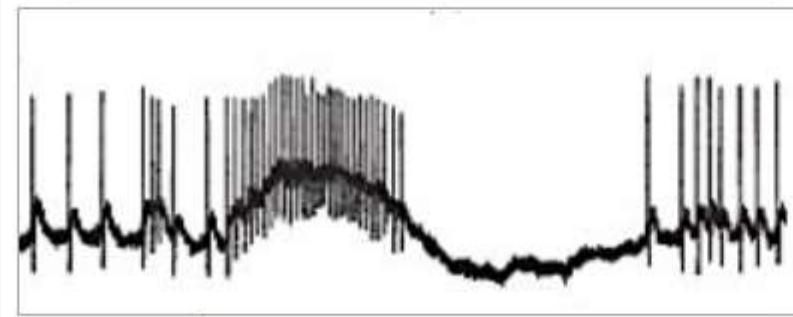
readout from olfactory behavioural assay
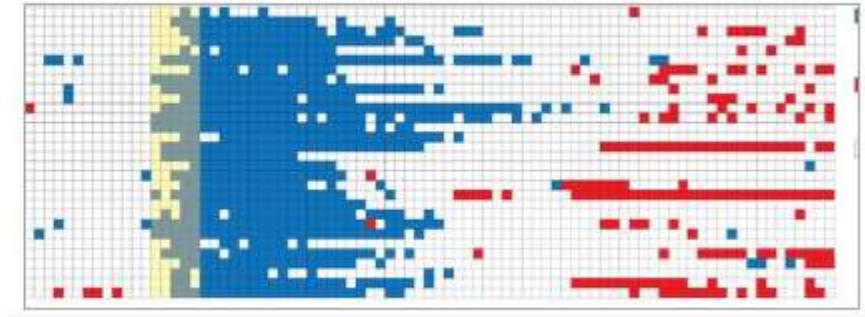
RHYTHMIC CONTROL OF THE ODOUR SENSITIVITY BY CLOCK-REGULATED NEUROPEPTIDES

CONNECTOMICS, ELECTROPHYSIOLOGY, CALCIUM IMAGING, CRISPR, OPTOGENETICS, PHARMACOGENETICS

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4. Labs and PhD proposals

ROOM 2 / CHEMISTRY AND CHEMICAL ENGINEERING

November 9 2021

| File number	School	Title	Advisors	Lab
2021_023	Chimie ParisTech - PSL	Surface treatments of aluminium alloys and corresponding corrosion behavior. Focus on the role of intermetallic particles.	Jolanta Swiatowska, Frédéric Wiame, Philippe Marcus	IRCP - Institut de Recherche de Chimie de Paris
2021_027	Chimie ParisTech - PSL	Synthesis of Biodegradable Polymers from Renewable Resources	Regis Gauvin, Christophe Thomas	IRCP - Institut de Recherche de Chimie de Paris
2021_029	Chimie ParisTech - PSL	Vectorizing nanoparticles using biocompatible and biodegradable polymer coating mediated by surface organometallic chemistry	Regis Gauvin, Christophe Thomas	IRCP - Institut de Recherche de Chimie de Paris
2021_031	Chimie ParisTech - PSL	Synthesis of Biobased Polymers from Renewable Resources: A New Tandem Approach	Christophe Thomas, Regis Gauvin	IRCP - Institut de Recherche de Chimie de Paris
2021_033	Chimie ParisTech - PSL	Smart multi-catalytic systems for the production of biocompatible polymers	Christophe Thomas, Regis Gauvin	IRCP - Institut de Recherche de Chimie de Paris
2021_047	Chimie ParisTech - PSL	Environmental behavior of novel multi-principal element alloys containing molybdenum	Dimitri Mercier, Philippe Marcus	IRCP - Institut de Recherche de Chimie de Paris
2021_071	Chimie ParisTech - PSL	Plastics Conversion in Molten Salts	Vincent Semetey, Virginie Lair	IRCP - Institut de Recherche de Chimie de Paris
2021_108	Chimie ParisTech - PSL	Surface reactivity of Mg anode in high-energy density Mg-air battery	Jolanta Swiatowska	IRCP - Institut de Recherche de Chimie de Paris
2021_030	Chimie ParisTech - PSL	2D/3D Perovskites for Stable and High-Efficiency Solar Cells	Thierry Pauporté	IRCP - Institut de Recherche de Chimie de Paris
2021_083	Chimie ParisTech - PSL	Recycling polyurethane using	Vincent Semetey	IRCP - Institut de Recherche de Chimie de Paris

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File number	School	Title	Advisors	Lab
2021_001	ESPCI Paris - PSL	Asymmetric multicomponent reactions in continuous-flow	Benjamin Laroche	C3M - Chimie Moléculaire, Macromoléculaire, et Matériaux
2021_028	ESPCI Paris - PSL	Using good vibrations to decrease the viscosity of non brownian suspensions.	Annie Colin	CBI - Chimie, Biologie et Innovation
2021_112	MINES ParisTech - PSL	Formulation of BioSynthetic Opals: How to Better Imitate the Mineralogy and Develop Inventive Systems	Severine A.e. Boyer, Alain Burr	CEMEF - Centre de mise en forme des matériaux
2021_025	ESPCI Paris - PSL	Entrance effects in osmotic nanofluidics for Blue Energy	Corentin Trégouët, Annie Colin	CBI - Chimie, Biologie et Innovation

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INNOVATIVE MATERIALS FOR ENERGY

RESEARCH INFRASTRUCTURES
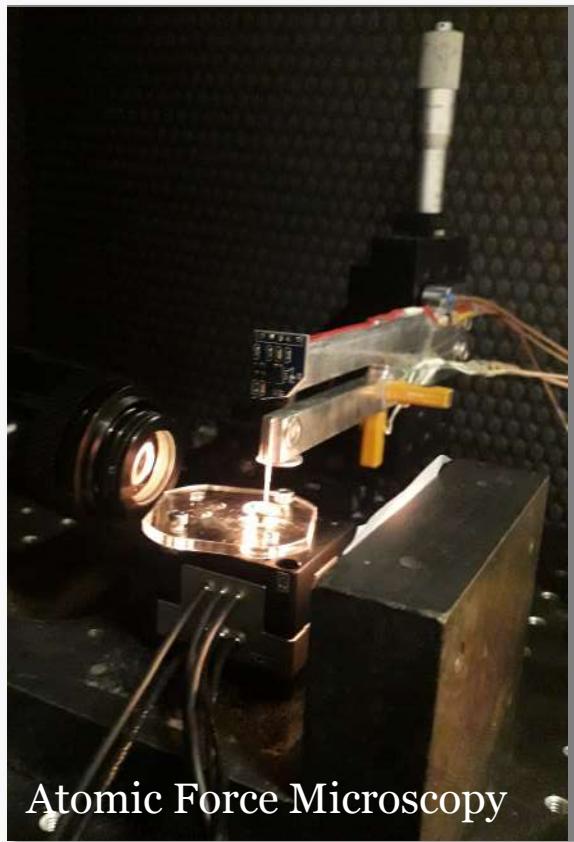
KEY RESEARCHER (S)

Rheomoter

Microfluidics

Atomic Force Microscopy

ANNIE COLIN

CORENTIN TREGOUET

Key facts / figures

2 teachers
4. 50% international students
1 post doc
1 master students

170 publications (7 by years)

15 patents

Prestigious partnerships with academic laboratories (universities, research organizations), companies (logos)

Lab's or staff's Awards (ERC, IUF, prix…)
Colin IUF junior Prix Maurice Couette

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Rheology of dispersions:

Role of the microscopical friction coefficient in the rheological properties of dispersions. Measurements of the frictional coefficient thanks to a tuning Fork microscope.

Comtet et all. Nature communications 8, no. 1 (2017): 1-7.

Flow batteries : Flow enhances properties of zinc/air batteries
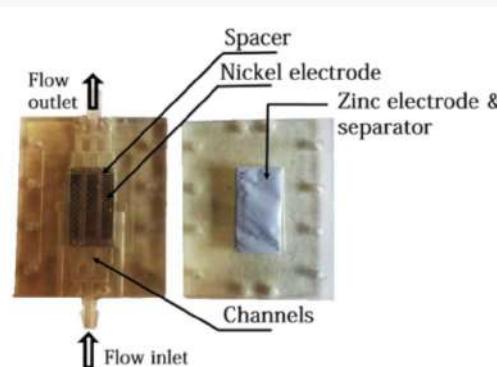
Abdelghani-Idrissi, Soufiane .Scientific Reports 11, no. 1 (2021): 1-1͞.

Smart sensors: A ultrasensitive pressure sensor made with foams

Pruvost, Mickael. npj Flexible Electronics 3, no. 1 (2019): 1-6.
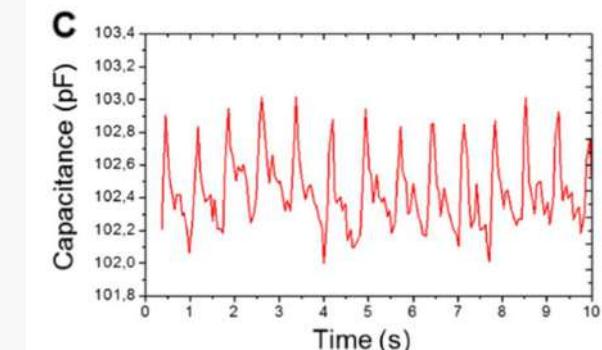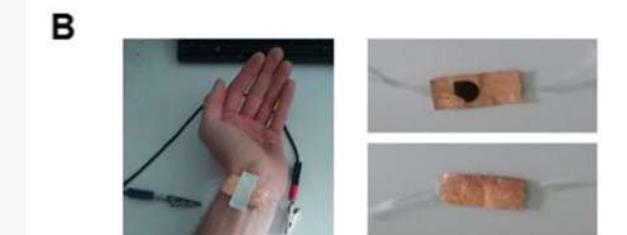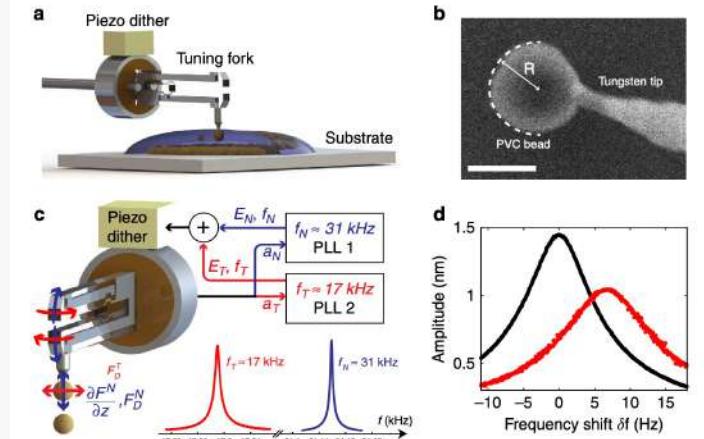
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Osmosis:

flow of water through a **membrane** because of **salt gradient**
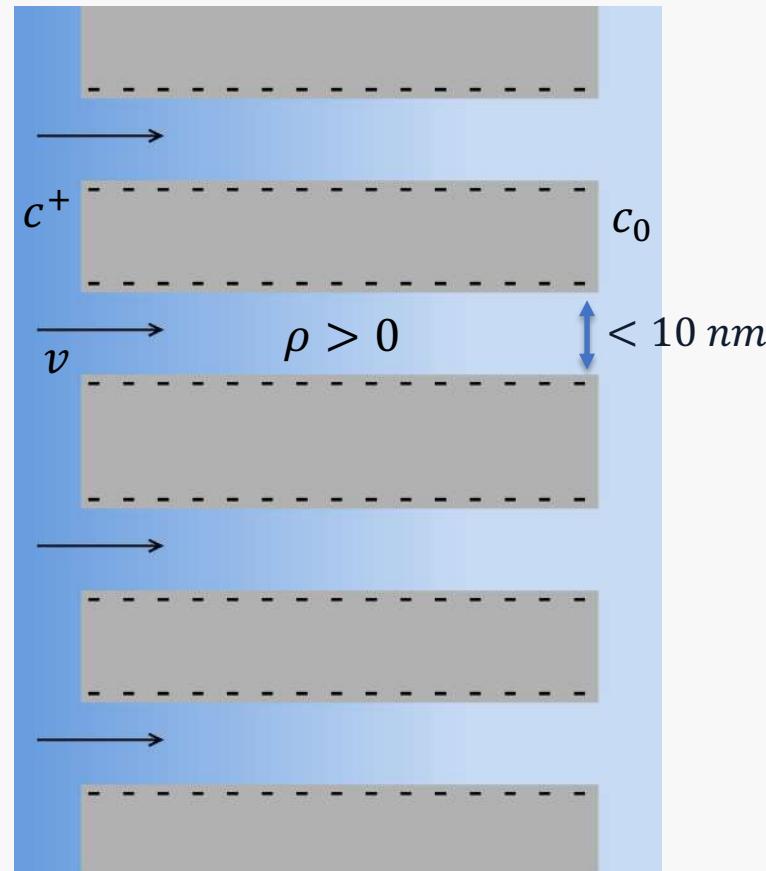
Possible energy harversting: **blue energy**

c^+ c_0

v $\rho > 0$ $< 10\ nm$
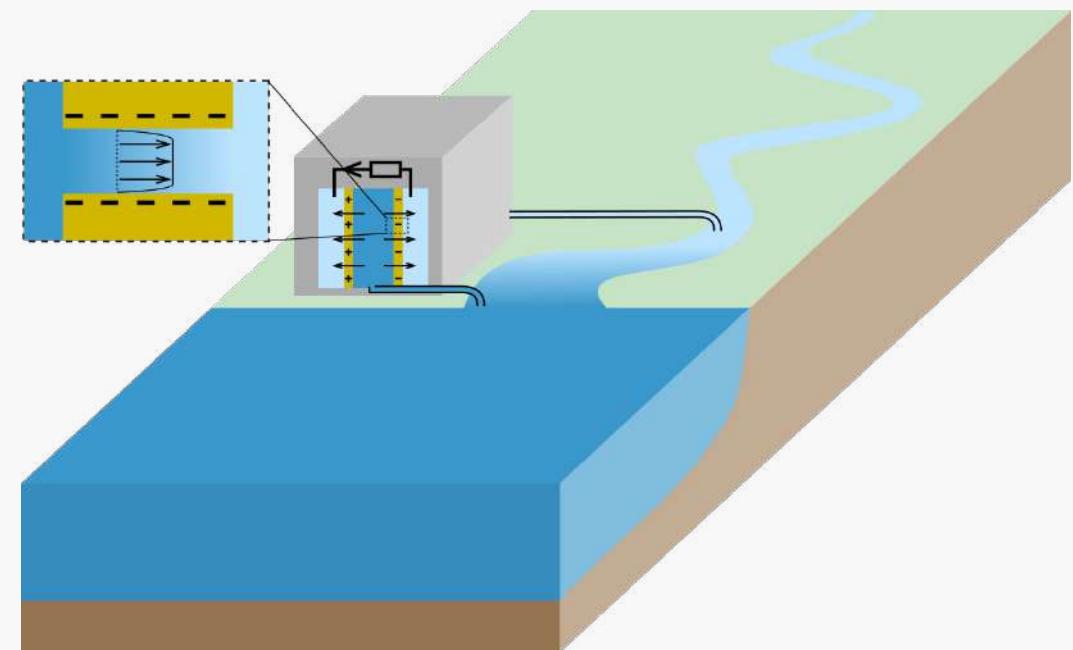
Main issue:
upscaling from 1 **nanopore** to a **nanoporous membrane** doesn't work as expected

Gao, J. *et al.* Understanding the Giant Gap between Single-Pore- and Membrane-Based Nanofluidic Osmotic Power Generators. *Small* **15**, 1–8 (2019).
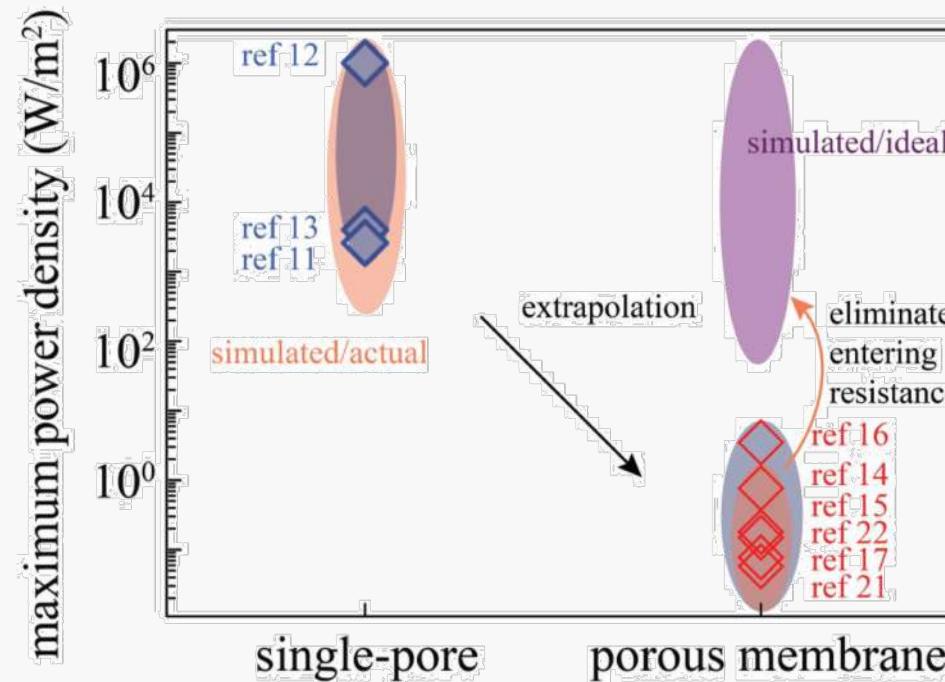
Entrance effect: concentration polarization
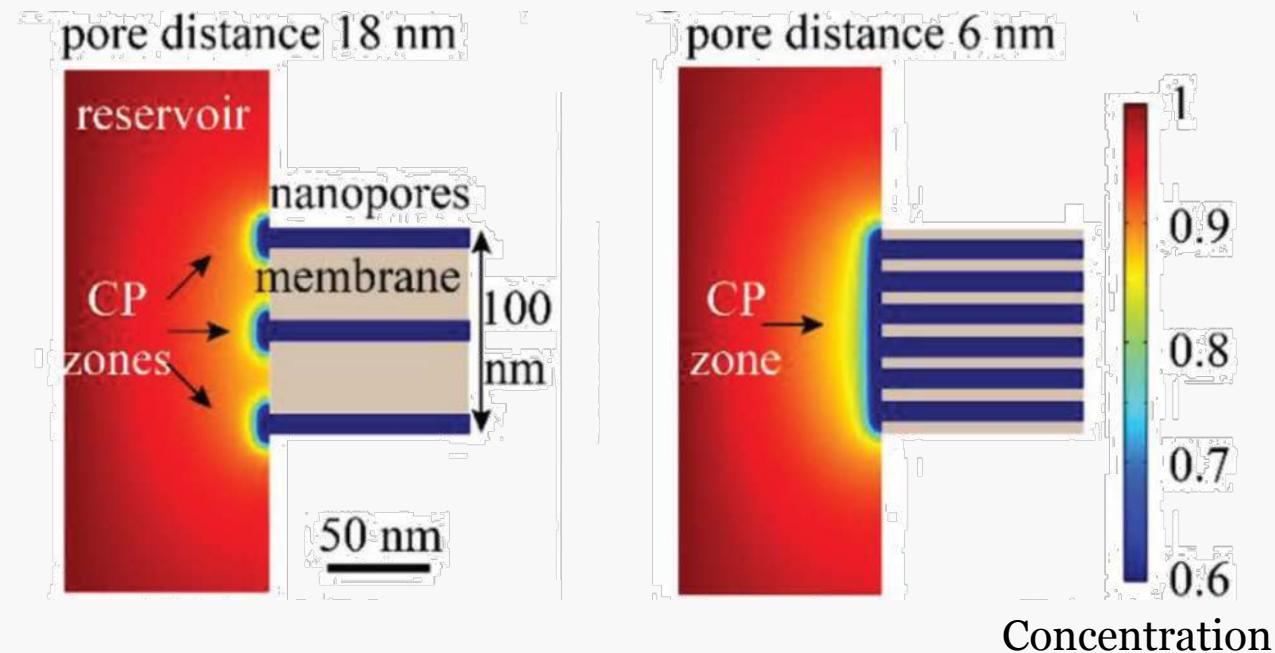
Observed in simulation, not in experiments

Gao, J. *et al.* Understanding the Giant Gap between Single-Pore- and Membrane-Based Nanofluidic Osmotic Power Generators. *Small* **15**, 1–8 (2019).

My approach:

use model system in micro/nanofluidics
observe experimentally this concentration polarisation
understand how to prevent it

Sketch of the model membrane
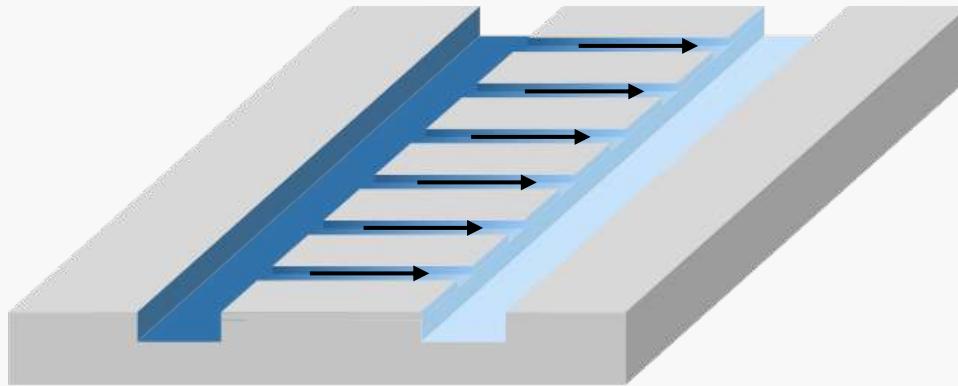
Example of our glass micro/nanofluidic chips

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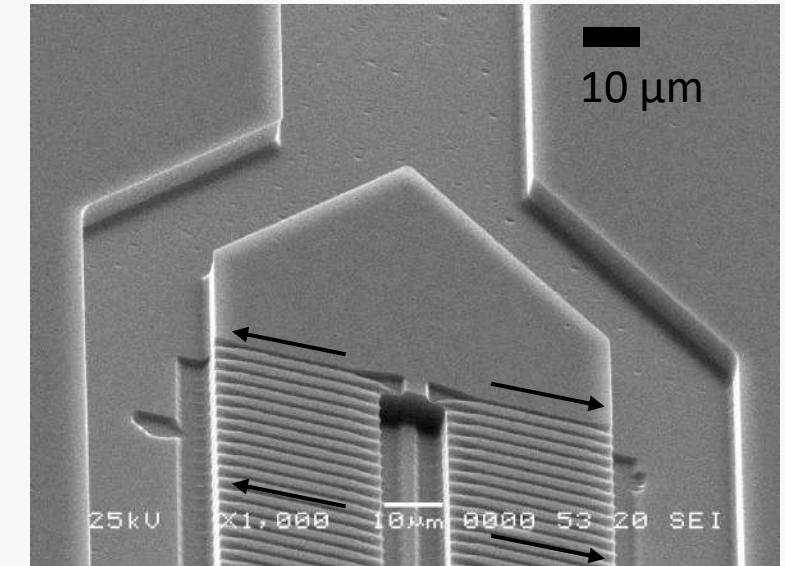
PARISTECH – CSC PHD PROGRAM

Using GOOD VIBRATIONS to make suspensions FLUID

- November 2021 -

How do ultrasonic waves turn a solid into a liquid?

Applications : 3D Printing
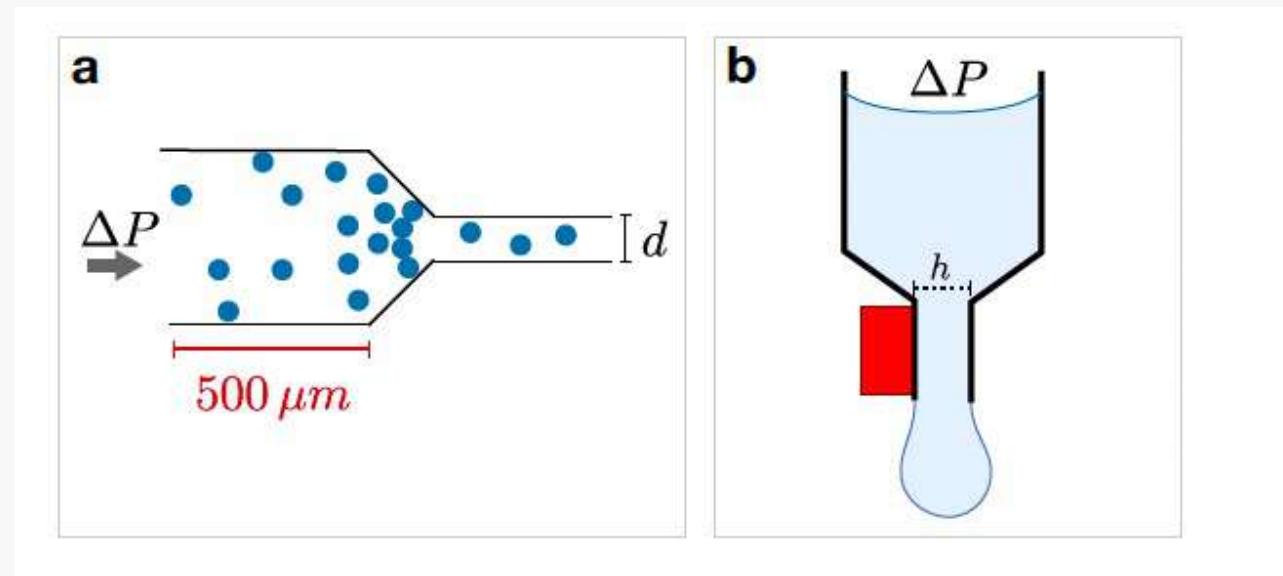
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Recycling Polyurethane Using Transurethanisation

Project n°2021_071

- Polyurethane (PU) is one of the most used polymers all over the world
- More than 24 million tons produced in 2019 (increasing by 4.5% per year)
- PU are presently not recycled and are landfilled or incinerated.

In this project, we want to develop a new strategy to recycle polyurethanes using depolymerization (base-catalyzed transurethanisation).

Highly versatile strategy since it can provide either virgin raw materials (polyols and diisocyanates) or directly new PU.

Rhone B., Semetey V.* Synlett **2017**, 28, 2004-2007.
Zhao L., Semetey V.* ACS Omega 2021, 6, 6, 4175–4183.

Contact : vincent.semetey@chimieparistech.psl.eu
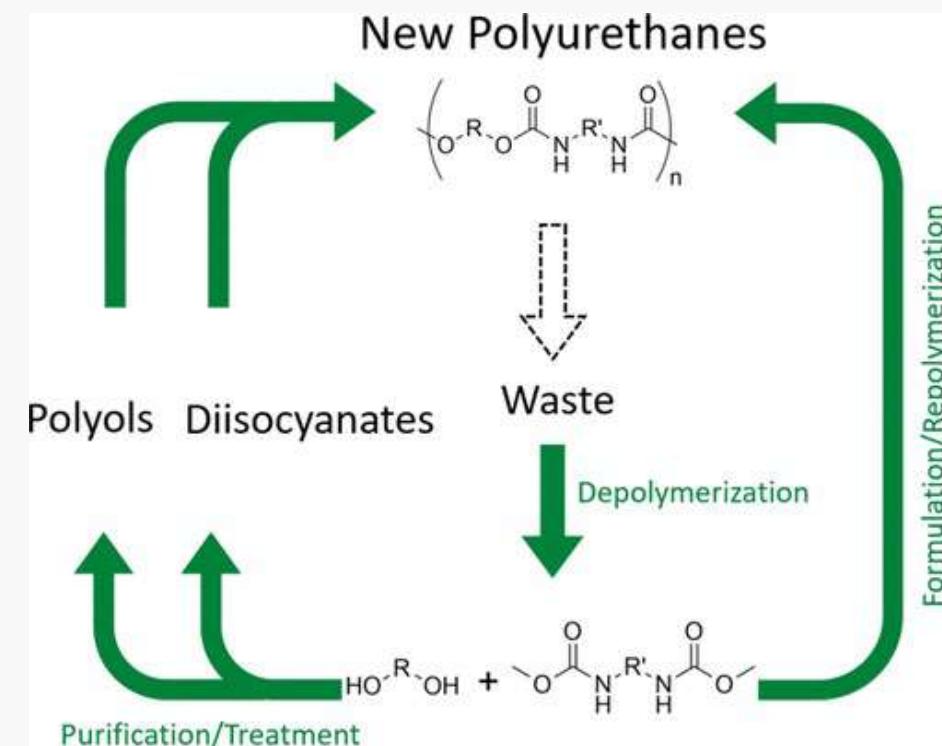
Plastics Conversion in Molten Salts

Project n°2021_083

- The recycling of plastic is challenging
- 0nly 32% of plastics are recycled in EU and 9% worldwide
- Most of the plastics are incinerated or
- Strong limitation in mechanical sorting
- Regulation limits strongly the exportation of
- The recycling of plastic wastes (particularly low grade plastics) is challenging in the absence of a strong economic driving force.
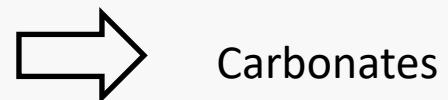
H_2

Carbonates

Fuel

In this project we want to investigate the conversion of plastics employing molten salts to valuable materials such as hydrogen, carbonates, carbon nanomaterial or fuel

$$C_aH_bO_c + 2a\ NaOH + a\text{-}c\ H_2O \rightarrow a\ Na_2CO_3 + (2a+b/2-c/2)\ H_2$$
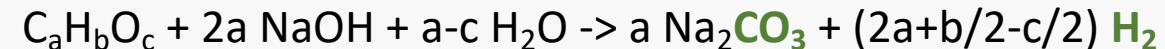
1 kg PE can produce 400 g H_2 and 7.5 kg of carbonate !

Contact : vincent.semetey@chimieparistech.psl.eu
or virginie.lair@chimieparistech.psl.eu

PCS Team, Philippe Marcus

Permanent researchers: 11   **Publications:** 25 in 2021
PhD and postdocs: 10   34 in 2020

Funding:

- EU (ERC), ANR
- Industry: IRT M2P, Safran, Total, St Gobain, Renault…

Research interests:

- relationships between structure, chemical composition & reactivity of metals, alloys and their oxides
- properties of solid/gas, solid/liquid, solid/solid interfaces

Approach:

- Experimental work + simulation
- Surface analysis – spectroscopy, microscopy, electrochemistry:
  - X-ray Photoelectron Spectroscopy (XPS)
  - Time-of-Flight Secondary Ion Mass Spectrometry (ToF-SIMS)
  - Scanning Tunnel Microscopy (STM)
  - Atomic Force Microscopy (AFM)
  - Static and dynamic elecrochemical techniques (OCP, EIS, LSV, CV…)

Applications:

Corrosion mechanisms and corrosion protection
Energy storage and conversions (batteries)
Surface treatments: coatings, thin films, surface functionalization, passivation
Biocompatibility, biomaterials, biocorrosion

PhD proposal 23: Surface treatments of aluminium alloys and corresponding corrosion behavior.
Focus on the role of intermetallic particles.

Objective:
- To identify the chemical surface modifications of Al alloys (e.g. AA2024, AA2050) induced by thermal or chemical treatments
- To evaluate the influence of these modifcations on the corrosion behaviour of Al alloys

Supervisor:
Jolanta Swiatowska

Approach:
In situ XPS & ex situ ToF-SIMS, nano-Auger, TEM, electrochemistry
Local analyses from macro to nano scale

Co-supervisors:
Frédéric Wiame
Philippe Marcus
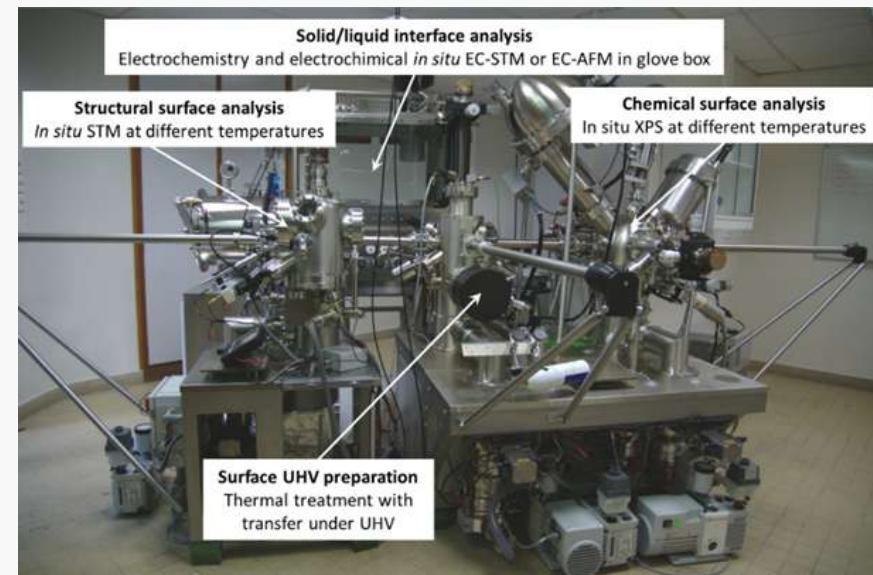
Intermetallic particles in AA 2050 (Al-Cu-Li)
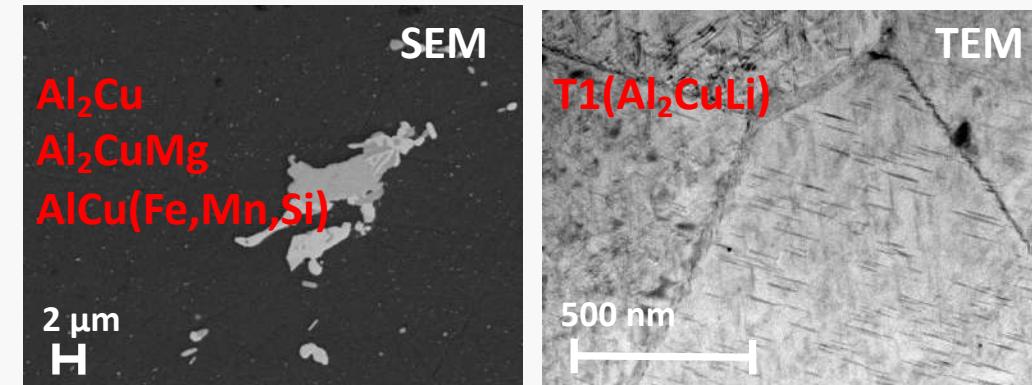
ToF-SIMS 3D chemical mapping
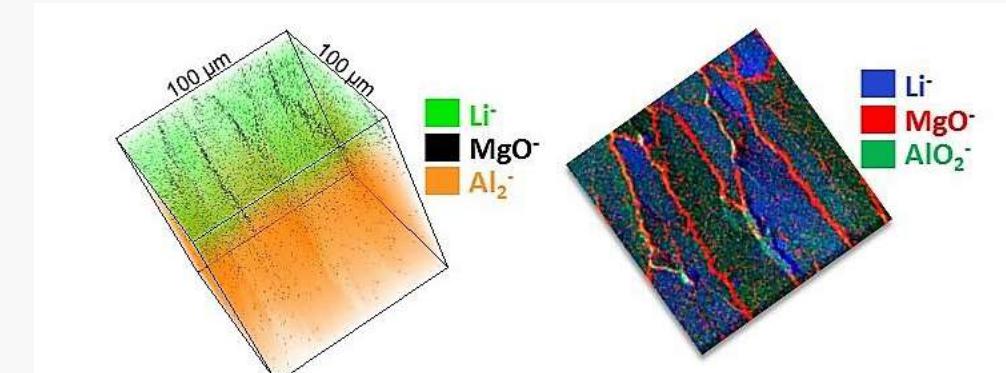
1. M. Li et al. App. Surf. Sci. (2020) DOI: 10.1016/j.apsusc.2020.147633
2. M. Li, et al. Corr. Sci. (2020) DOI: 10.1016/j.corsci.2020.109040
3. M. Li, et al. NPJ Mat. Deg. (2021) DOI: 10.1038/s41529-021-00170-9

PhD proposal 108: Surface reactivity of Mg anode in high-energy density Mg-air battery

Objective:
- To better understand Mg electrode/electrolyte interface reactivity
- To optimize the electrochemical and discharge performances of Mg anode in Mg-air battery

Supervisor:

Jolanta Swiatowska

Approach:

Microscopic, surface (XPS, ToF-SIMS) analyses and electrochemical tests

Modification of electrolyte, addition of corrosion inhibitors, Mg surface treatment…

ToF-SIMS
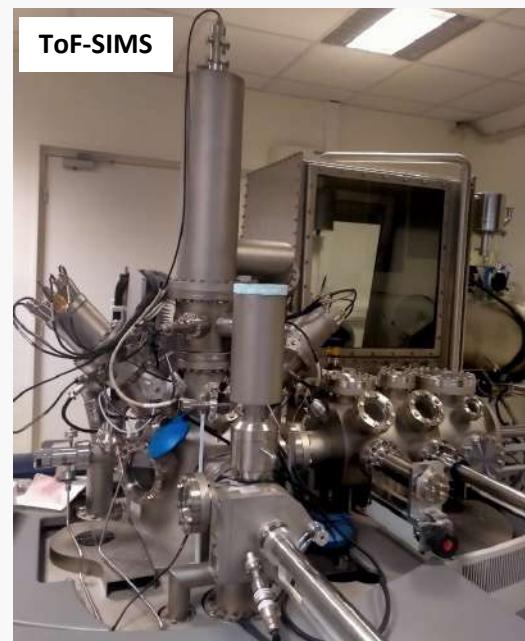
Mg after immersion in hybrid H_2O-organic (%) electrolyte

0%

2 mm

20%

60%
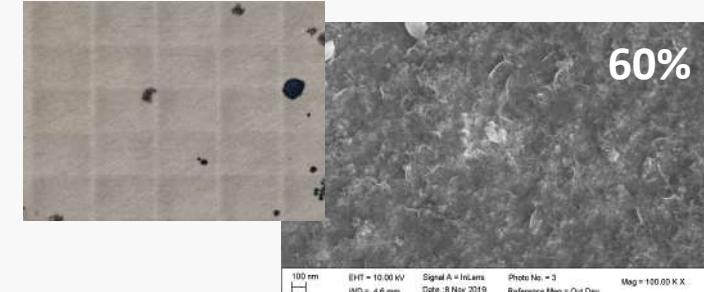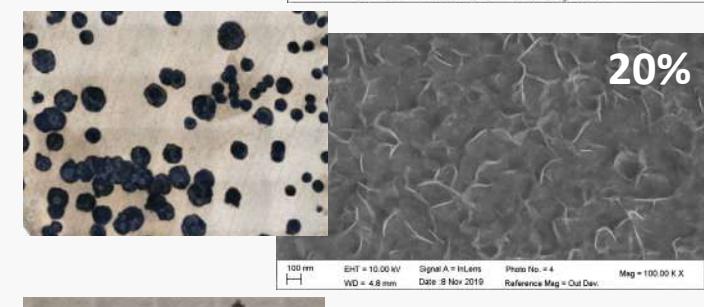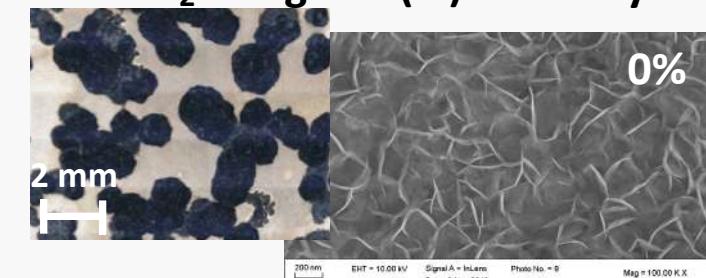
Mg corrosion ↘

Discharge potential ↗
Discharge current ↗
Battery life time ↗

1. B. Tian, et al. Electrochim. Acta (2018) DOI: 10.1016/j.electacta.2017.10.136
2. Z.-Y. Wu, et al. ACS Omega (2021) DOI: 10.1021/acsomega.1c04226
3. C. Pereira-Nabais, et al. Appl. Surf. Sci. (2013) DOI: 10.1016/j.apsusc.2012.10.165

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ESPCI-PARIS PSL

- C3M Laboratory

Head

Michel Cloitre

C3M LABORATORY

NEW BUILDING UNDER CONSTRUCTION (BRAND NEW RESEARCH LABS READY FOR THE END OF 2022)

PREVIOUS LAB'S DIRECTORS (ACADEMY OF SCIENCE MEMBERS)
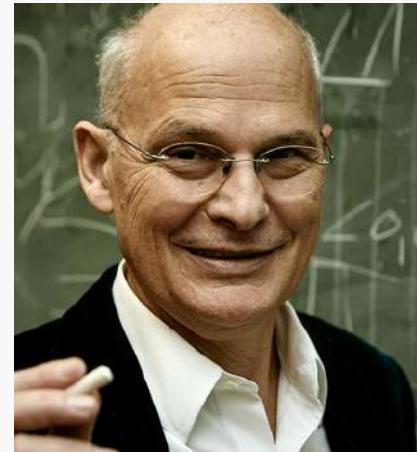
PR. LUDWIG LEIBLER (VITRIMERS)

PR. JANINE COSSY (ORGANIC SYNTHESIS)

Name   Name

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C3M LABORATORY

KEY FACTS / FIGURES

Permanent researchers: 14
Doctoral students: 22 (>50 % international)
Post-docs: 9

Industrial partnerships

2021: 22 publications
2020: 29 publications
2019: 24 publications
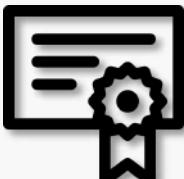
International patents (2015-2019): 21

Academy of Science membership (J. Cossy)
Weissenberg award (M. Cloitre)

Explore the chemical space through sustainable methods

Earth-abundant metal catalysis (Fe, Co)

Cobalt-Catalyzed α-Arylation of Substituted α-Bromo α-Fluoro β-Lactams with Diaryl Zinc Reagents: Generalization to Functionalized Bromo Derivatives

Mélanie M. Lorion[+],[a] Vanessa Koch[+],[a, b] Martin Nieger,[d] Hi-Yung Chen,[e] Aiwen Lei,[e] Stefan Bräse,[b, c] and Janine Cossy*[a]

Chem. Eur. J. **2020**, *26*, 13163 – 13169

X = NR, O, CH₂   R⁴ = Aryl, Allyl
R¹ = F, R² = alkyl
R¹, R² = Alkyl
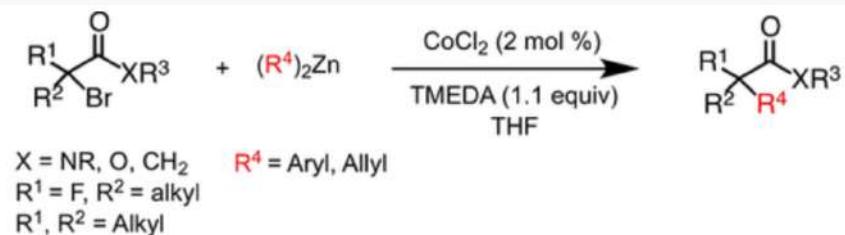
Cobalt-Catalyzed 1,4-Aryl Migration/Desulfonylation Cascade: Synthesis of α-Aryl Amides

Nicolas Gillaizeau-Simonian, Etienne Barde, Amandine Guérinot,* and Janine Cossy*[a]

Chem. Eur. J. **2021**, *27*, 4004 – 4008

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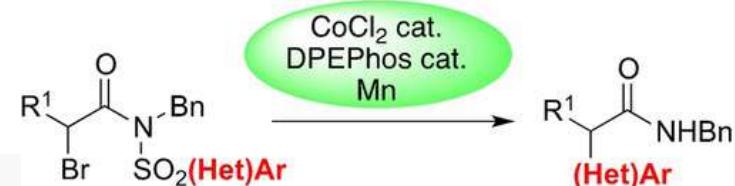
Explore the chemical space through sustainable methods

Constraint rings

Fluorine chemistry

Asymmetric Transfer Hydrogenation of *gem*-Difluorocyclopropenyl Esters: Access to Enantioenriched *gem*-Difluorocyclopropanes

Khalil Yamani, Hugo Pierre, Alexis Archambeau, Christophe Meyer,* and Janine Cossy*

Angew. Chem. Int. Ed. **2020**, 59, 18505−18509

R = Aryl, Me, (CH₂)₂OTBDPS, (CH₂)₃OBn; R' = Me, *t*-Bu, Bn
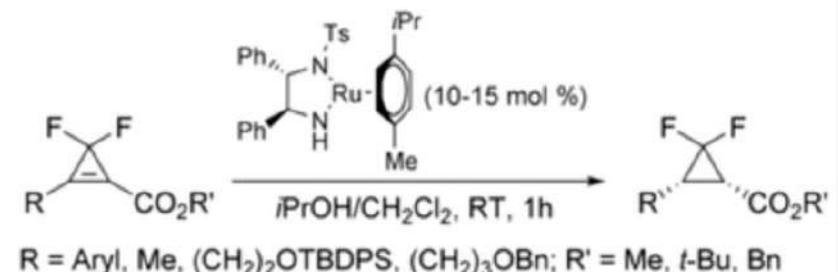
Radical Addition of SF₅Cl to Cyclopropenes: Synthesis of (Pentafluorosulfanyl)cyclopropanes

Gauthier Lefebvre, Olivier Charron, Janine Cossy,* and Christophe Meyer*

Org. Lett. 2021, 23, 5491−5495

R³ = CO₂Alkyl, CH₂OAc, Ph; R'³ = H, CO₂Me, CH₂OAc
R² = Alkyl, (CH₂)ₙOR, CH₂NPhth
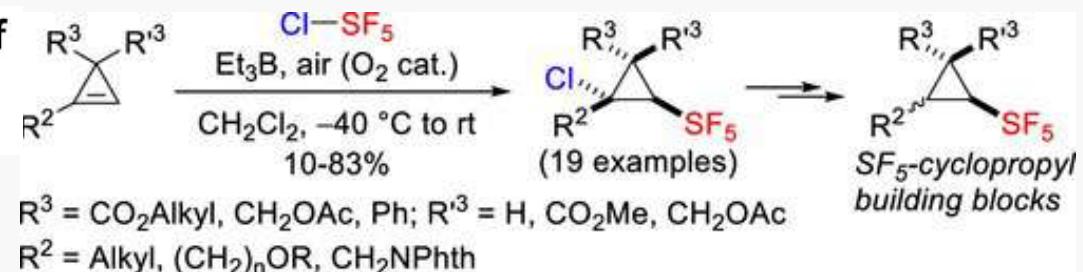
Explore the chemical space through sustainable methods

Flow Chemistry

Heterogeneous catalysis

Photochemistry

reagent A + reagent B

Easily accessible substrates

reagent C   reagent B

Products

Bioactive compounds

heterogeneous catalysts
+
atom economical reactions
=
Ideal flow reaction

multicomponent reactions
=
Innovative green chemistry

HN—CO$_2$Et
1 eq.

0.1M in toluene

Ph—CHO
1.2 eq.

0.1 mL/min **A**

0.1 mL/min **B**

Y-shape mixer

H$_2$ (15 mL/min)

Cat. (0.05 mmol)
AC (0.4 g)
4.8x100 mm SUS
80 °C

5 °C

CO$_2$Et
N—Ph
(1)
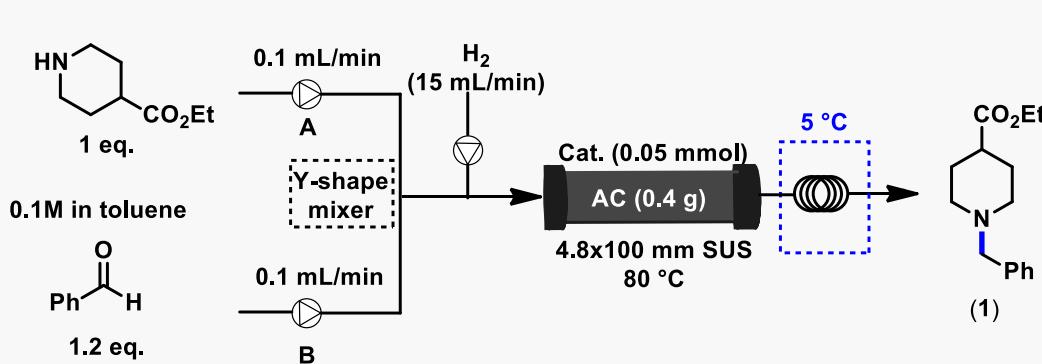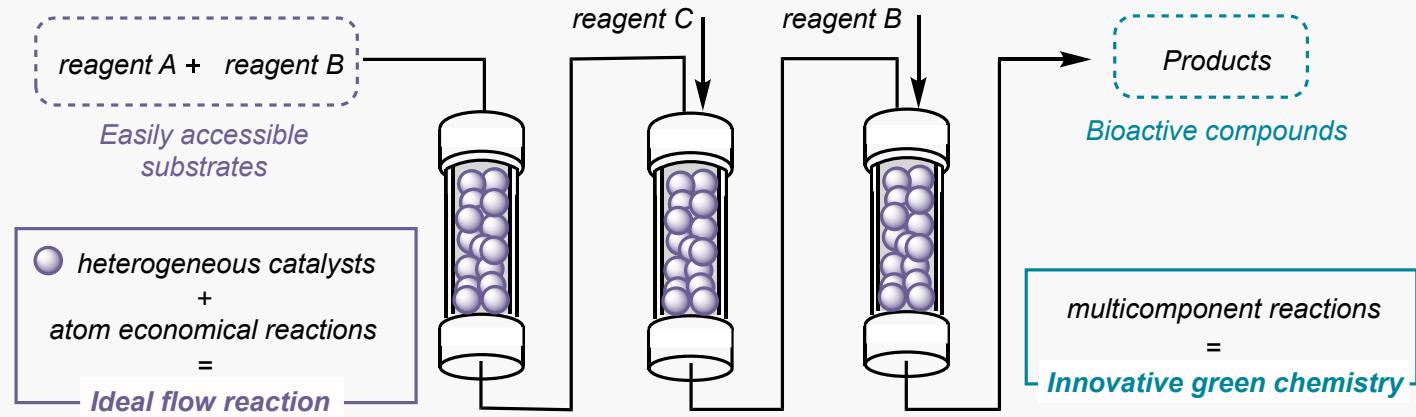
B. Laroche *et al*, *Adv. Synth. Catal.* **2018**, *360*, 46995.

MeO, MeO
+
H—, N—Ph

THF/iPrOH (9:1)
+2% H$_2$O

0,15 mL/min   H$_2$

MeO, MeO
donepezil
anti-Alzheimer
N—Ph
92-95%
7.7g / day

A26 (basic resin)
Pd-DMPSi/Al$_2$O$_3$
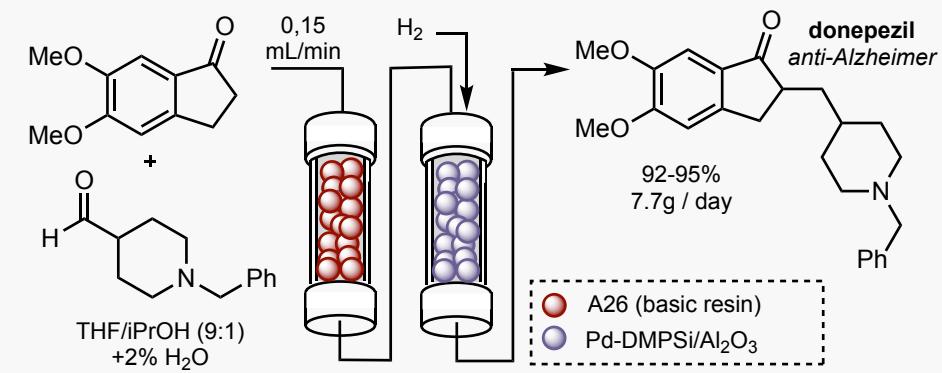
B. Laroche *et al*, *Org. Process Res. Dev.* **2019**, *23*, 961.

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4. Labs and PhD proposals

ROOM 3 / DESIGN INDUSTRIALIZATION + MATERIAL SCIENCE

November 9 2021

File number	School	Title	Advisors	Lab
2021_095	Arts et Métiers	Consequences of climate change on the structural integrity of buried large-diameter water-transmission mains	Humberto Yanez Godoy	I2M - Institut de Mécanique et d'ingénierie
2021_012	Arts et Métiers	Machine learning based Adaptive Multivariate Statistical Process Control	Jean-Yves Dantan, Lazhar Homri, Wahb Zouhri	LCFC - Laboratoire de conception, fabrication, commande
2021_013	Arts et Métiers	Supervised machine learning for tolerance allocation	Jean-Yves Dantan	LCFC - Laboratoire de conception, fabrication, commande
2021_039	Arts et Métiers	Risk management of engineering products driven by artificial intelligence	Ali Siadat, Jelena Petronijevic, Alain Etienne	LCFC - Laboratoire de conception, fabrication, commande
2021_043	Arts et Métiers	Innovative Design for Additive Manufacturing through Knowledge Management and TRIZ	Ali Siadat, Alaa Hassan	LCFC - Laboratoire de conception, fabrication, commande
2021_052	Arts et Métiers	Robust robotic grinding control to take into account process variability	Régis Bigot, Thibaut Raharijaona, Sandra Chevret	LCFC - Laboratoire de conception, fabrication, commande
2021_054	Arts et Métiers	Automation of a flexible and agile finishing process of forged workpieces with industrial robots	Tudor Balan, Cyrille Baudouin, Sandra Chevret	LCFC - Laboratoire de conception, fabrication, commande
2021_065	Arts et Métiers	How to adapt reconfigurable production systems to product variability	Jean-Yves Dantan, Ali Siadat, Paul Stief	LCFC - Laboratoire de conception, fabrication, commande
2021_085	Arts et Métiers	Design a safe work-cell for human-robot co-activity in industry	Thibaut Raharijaona, Yier Wu, Jonathan Savin	LCFC - Laboratoire de conception, fabrication, commande
2021_094	Arts et Métiers	Identification of parameters control and Improvement from thixoforging process of aluminums (vs Steel)	Régis Bigot	LCFC - Laboratoire de conception, fabrication, commande

PROPOSALS/LABS 2/2

File number	School	Title	Advisors	Lab
2021_106	Arts et Métiers	Modeling of the wood behavior under severe loading conditions: case of the veneer cutting by rotary peeling process	Louis Denaud, Mariem Yaich, Stéphane Girardon	LABOMAP - Laboratoire Bourguignon des matériaux et procédés
2021_014	Arts et Métiers	Contribution to the integration of Additive Manufacturing and Augmented Reality in early design phases to foster Creativity	Frédéric Segonds, Ruding Lou	LCPI - Laboratoire conception de produits et innovation
2021_035	Arts et Métiers	Learning with immersive technologies	Simon Richir, Geoffrey Gorisse, Sylvain Fleury	LAMPA - Laboratoire angevin de mécanique, procédés et innovation
2021_086	Arts et Métiers	Intelligent Visual Analytics for the Design and Monitoring of Turbo Engine Systems	Samir Garbaya, Sofiane Khelladi	LIFSE - Laboratoire Ingénierie des Fluides Systčmes Energétiques
2021_026	Arts et Métiers	Simultaneous optimization of anisotropy and topology of composites from additive manufacturing process by considering strength criteria based on invariants	Marco Montemurro, Anita Catapano	I2M - Institut de Mécanique et d'ingénierie
2021_101	Arts et Métiers	Modeling of the fluid-solid interactions during steady and transient flows of non-Newtonian fluids through deformable porous media	Azita Ahmadi-Senichault, Antonio Rodriguez De Castro, Abdelaziz Omari	I2M - Institut de Mécanique et d'ingénierie
2021_102	Arts et Métiers	Multi-scale approach for the development of effective soil remediation methods based on foam injection	Azita Ahmadi-Senichault, Antonio Rodriguez De Castro, Abdelaziz Omari	I2M - Institut de Mécanique et d'ingénierie

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KEY FACTS / FIGURES

Faculty: **24** including 5% of international members

PhD students: **24** including 67% of intl PhD students

Post-docs: **1**

Prestigious partnerships with academic laboratories (universities, research organizations), companies (logos)

Publications: **28** in international journals in 2019

I*nternational co-publications*: **10** in 2019

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PATH CORRECTION OF AN INDUSTRIAL ROBOT USED FOR FSW (FRICTION STIR WELDING)

Keywords : robotic FSW, stiffness model, path correction, deflection compensator, residual welding path deviation

Robot Controller and
robot in interaction
with the workpiece
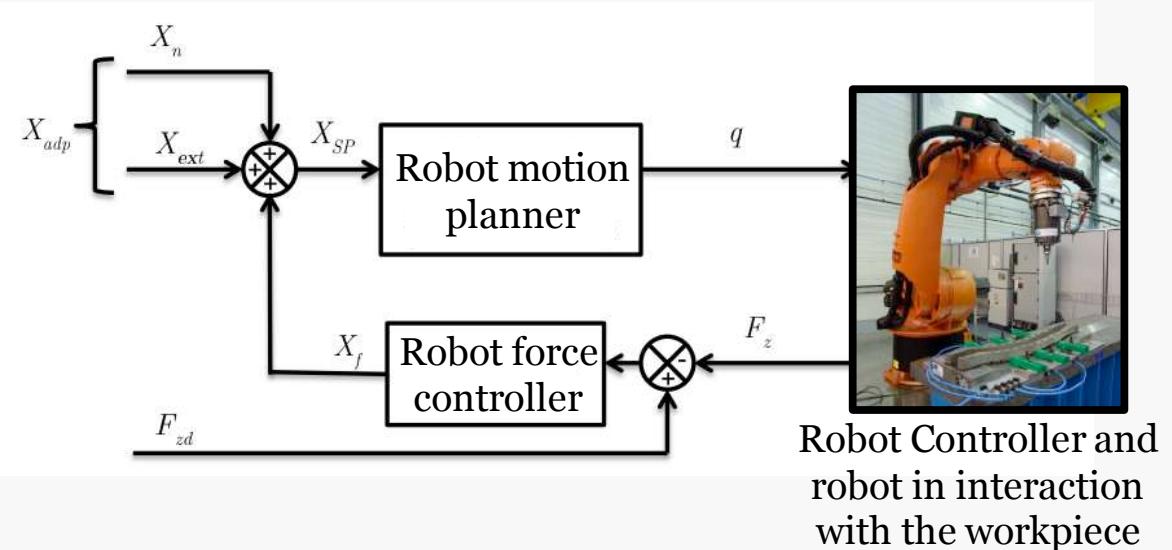
Robot low stiffness + high process loads
→ elastic robot deformation
→ welding toolpath deviation (up to 2.8 mm)
→ weld seam defects

Research work:
- predict position & orientation deviations
- toolpath programming approach for robotic FSW

Novel approach: approximations of toolpath by Bézier or B-splines curves

Experimental validation → average residual toolpath deviation of 0.3 mm and weld seams without defects

4 papers in *Industrial Robot: An International Journal*
1 book chapter
13 international conference proceedings

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CSC – PhD topics presentation

Modeling of the fluid-solid interactions during steady and transient flows of non-Newtonian fluids through porous media

Supervisors :

Azita Ahmadi-Sénichault: Professor, Arts et Métiers
Abdelaziz Omari: Professor, INP-Bordeaux
Antonio Rodríguez de Castro: Associate Professor, Arts et Métiers

Introduction

The study of the mechanical interactions between a non-Newtonian fluid and a deformable solid wall is at the interface between fluid physics and solid mechanics, and is of interest in many applications, including health and materials fields (polymer composites manufacturing).

fluid-solid interactions during the flow of non-Newtonian fluids through porous media
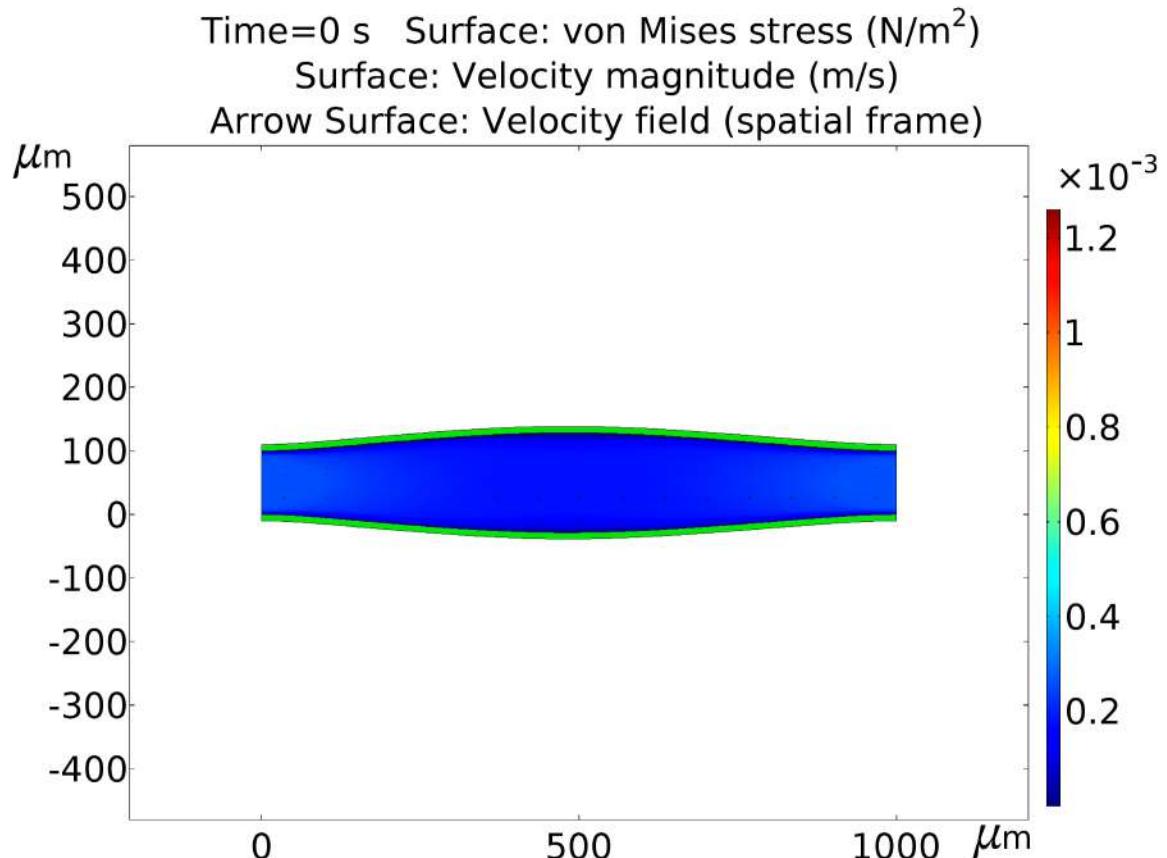
Flow of a non-Newtonian fluid through a network of deformable capillaries

The flow of blood (non-Newtonian fluid) throughout the entire vascular network of arteries, veins and vessels of varying sizes plays a major role in the functioning human body by supplying our cells with oxygen and nutrients. A partial or total blockage (thrombus) in this vascular network due to an atheroma deposit consisting of cholesterol and cellular debris on the walls of the arteries can lead to atherosclerosis and heart attack or to a stroke. A detailed understanding of blood flow both at the local level and at the level of the capillary network is therefore essential for the development of preventive and therapeutic strategies.

fluid-solid interactions during the flow of non-Newtonian fluids through porous media
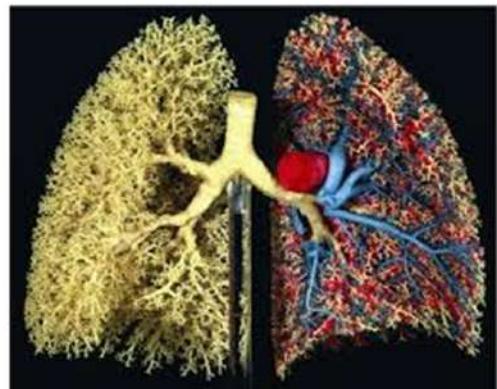
Figure 2. *Resin cast of the human respiratory tree showing the dyadic branching of the bronchi from the trachea and the systematic reduction in the diameter and length of the airways with progressive branching. In the left lung, pulmonary arteries (red) and veins (blue) are also represented (Weibel 2009).*
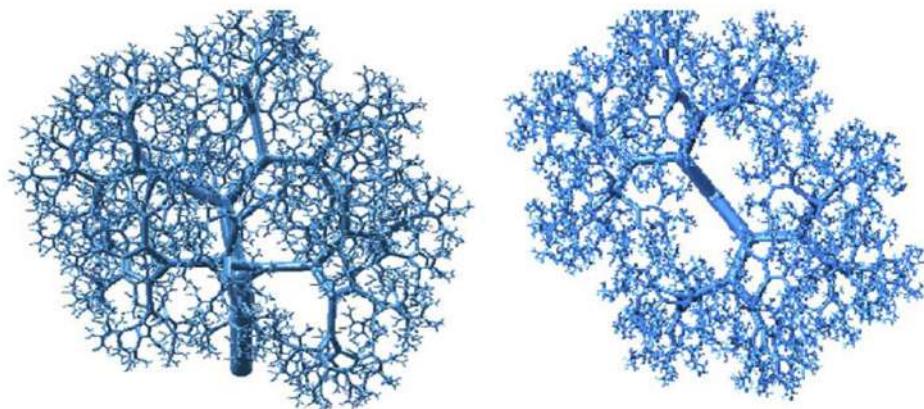
Figure 3. *3D geometry of fractal vascular symmetrical tree. Vessel diameters are multiplied 10 times for better graphical representation only. Ezbieta et al. (2005)*

Objective

To develop a macroscopic model for the flow of a shear-thinning fluid through a deformable porous medium by using pore network modelling methods. The accuracy of the model will be assessed through cutting-edge laboratory experiments and numerical simulations.

fluid-solid interactions during the flow of non-Newtonian fluids through porous media
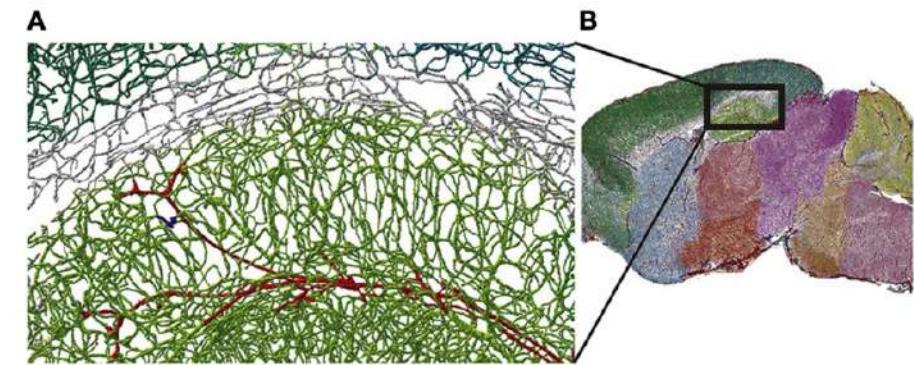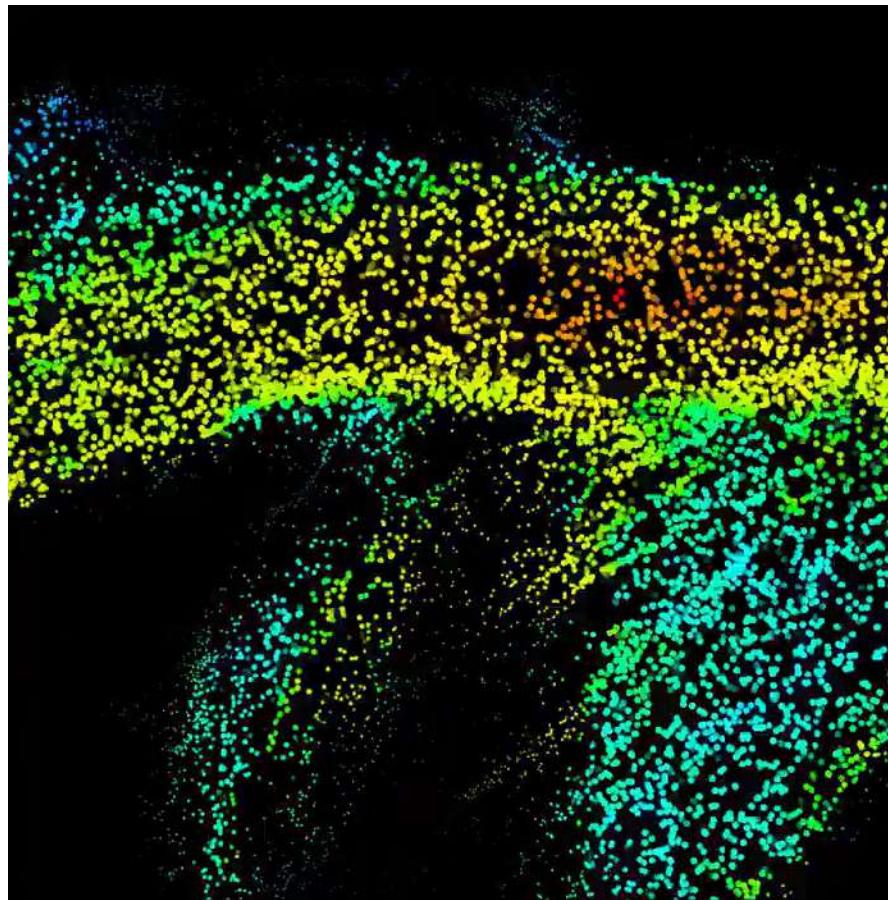
Figure 1. *Multiscale architecture of microvascular networks in a mouse brain obtained by light sheet microscope. (A) Microscopic scale of interconnected capillaries. (B) Macroscopic scale where the network of capillaries can be represented by a continuous equivalent medium. (Adapted from Kirst et al. 2020)*

References

Demené, Ch., Robin, J., Dizeux, A., Heiles, B., Pernot, M., Tanter, M., Perren, F. (2020). Deep Transcranial Adaptive Ultrasound Localization Microscopy of the Human Brain Vascularization: supplemental software and data. https://zenodo.org/record/4048550#.YYl8BxqZOUk

Ezbieta, G., Rybaczuk, M., Kezdzia, A. (2005). Fractal models of circulatory system. Symmetrical and asymmetrical approach comparison. Chaos, Solitons and Fractals 24 (2005) 707–715

Kirst, C., Skriabine, S., Vieites-Prado, A., Topilko, T., Bertin, P., Gerschenfeld, G., Verny, F., Topilko, P., Michalski, N., Tessier-Lavigne, M., Renier, N (2020). Mapping the Fine-Scale Organization and Plasticity of the Brain Vasculature. Cell 180, 780–795

Peyrounette, M., Davit, Y., Quintard, M., Lorthois, S. (2018). Multiscale modelling of blood flow in cerebral microcirculation: Details at capillary scale control accuracy at the level of the cortex. PLoS One 13(1), e0189474.

Rodríguez de Castro, A., Goyeau, B. (2021). A pore network modelling approach to investigate the interplay between local and Darcy viscosities during the flow of shear-thinning fluids in porous media. Journal of Colloid and Interface Science 590, 446 – 457.

Weibel, E. R. (2009). What makes a good lung? Review article. Swiss Medical Weekly 139(27–28), 375–386.

CSC – PhD topics presentation

Multi-scale approach for the development of effective soil remediation methods based on foam injection

Supervisors :

Azita Ahmadi-Sénichault: Professor, Arts et Métiers
Abdelaziz Omari: Professor, INP-Bordeaux
Antonio Rodríguez de Castro: Associate Professor, Arts et Métiers

Introduction
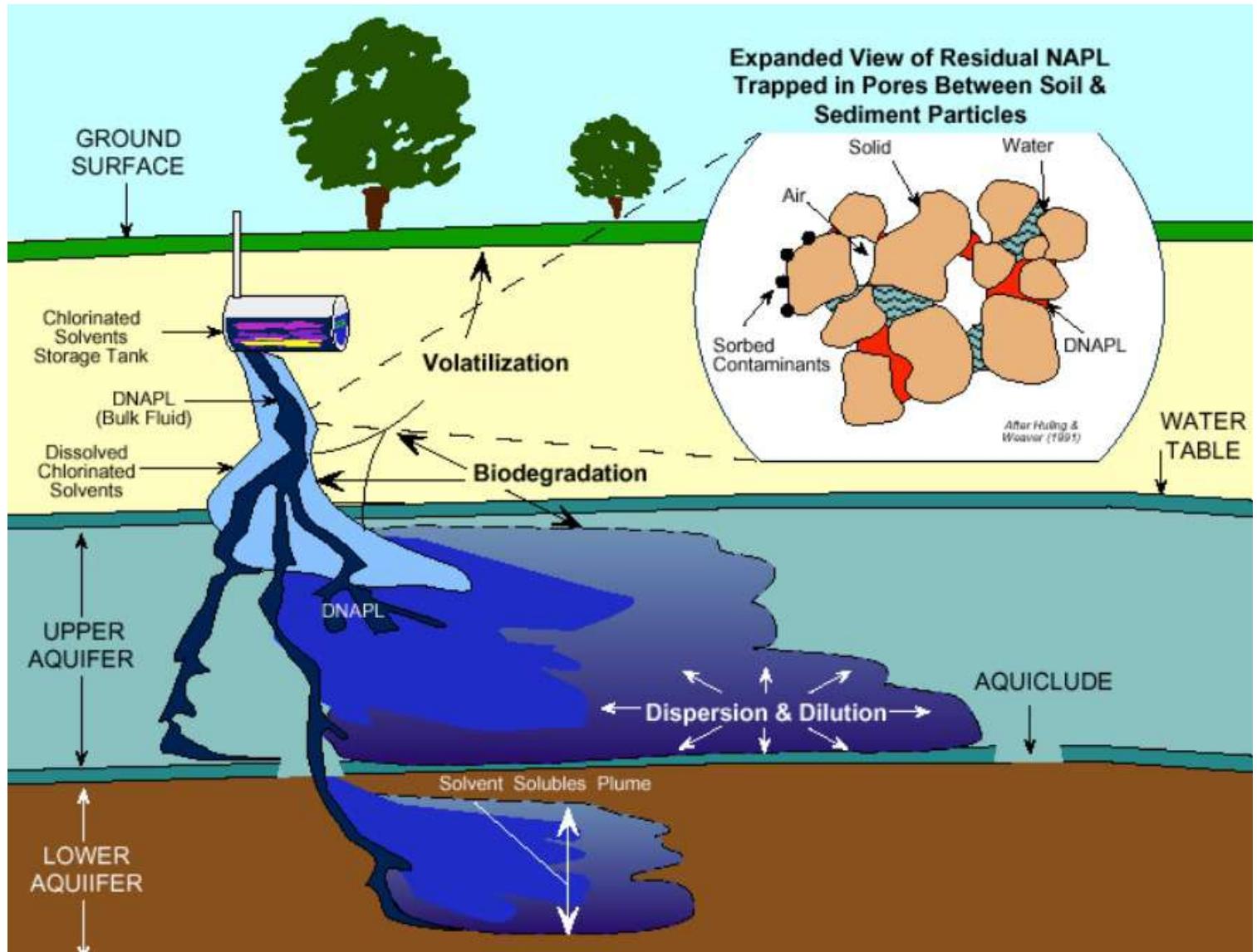
effective soil remediation methods based on foam injection

Soil remediation methods based on foam injection

Injecting a displacing fluid into heterogeneous or fracture-containing polluted soil generates preferential flow, leading to low sweeping efficiency. The use of foams has proven to be a relevant solution to overcome this problem.

effective soil remediation methods based on foam injection

Foam

Viscous fingering

Stable front

Water injection

Foam injection
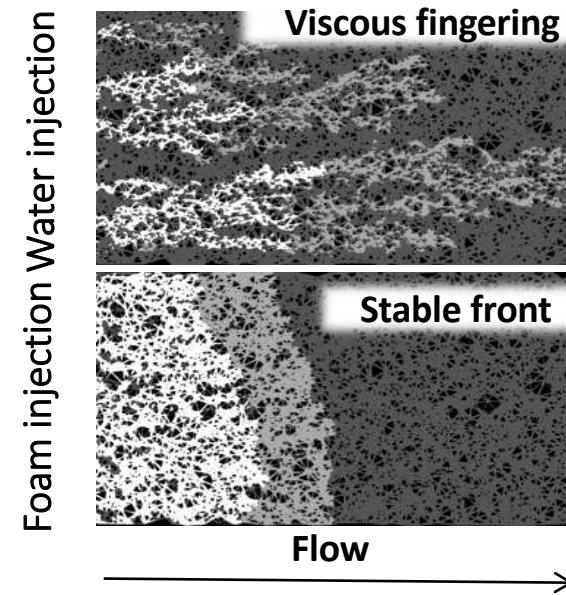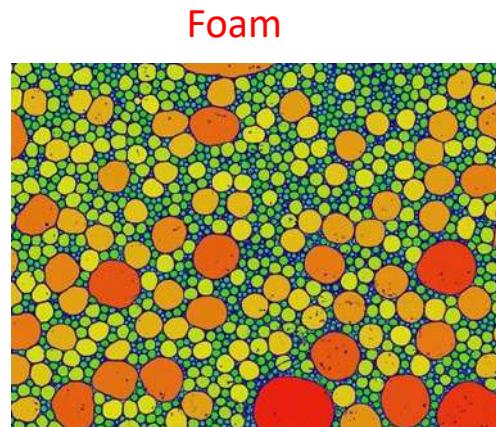
Flow

Objective:

Develop a model to predict foam flow in porous media for hydrocarbon removal.

Numerical simulation and experimental validation of the model.

Multi-scale approach : numerical simulations

1) Direct Numerical Simulation at the pore scale : with and without pollutant

effective soil remediation methods based on foam injection
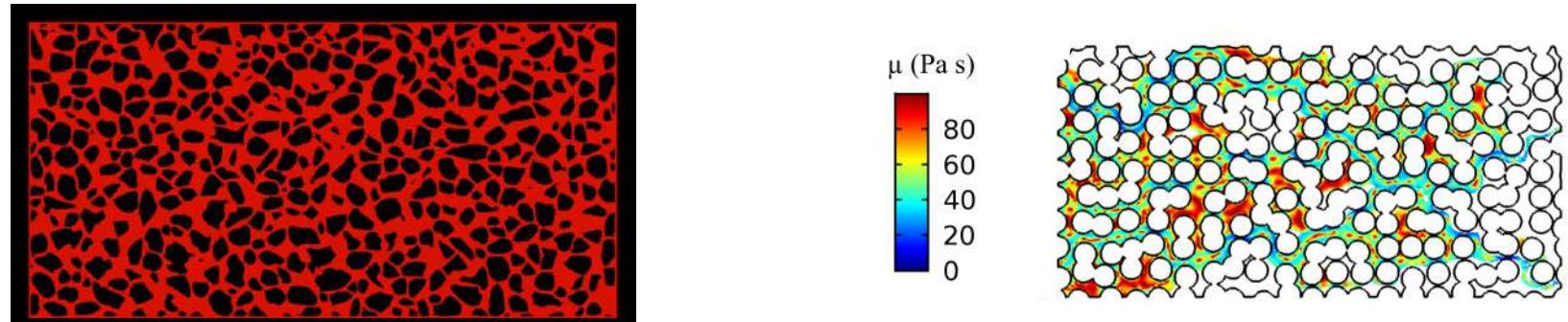
2) Flow simulations based on pore-network modelling
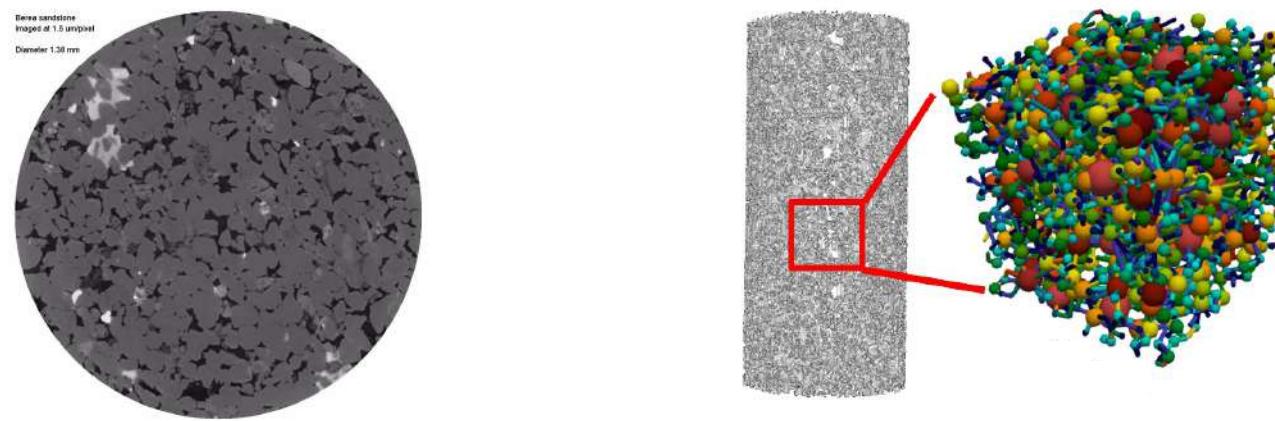
3) On the basis of the numerical results : Modeling the effects of microscopic mechanisms on the relationships between flow quantities at the macroscopic scale

Multi-scale approach : experimental validation

effective soil remediation methods based on foam injection

1) Microfluidic experiments
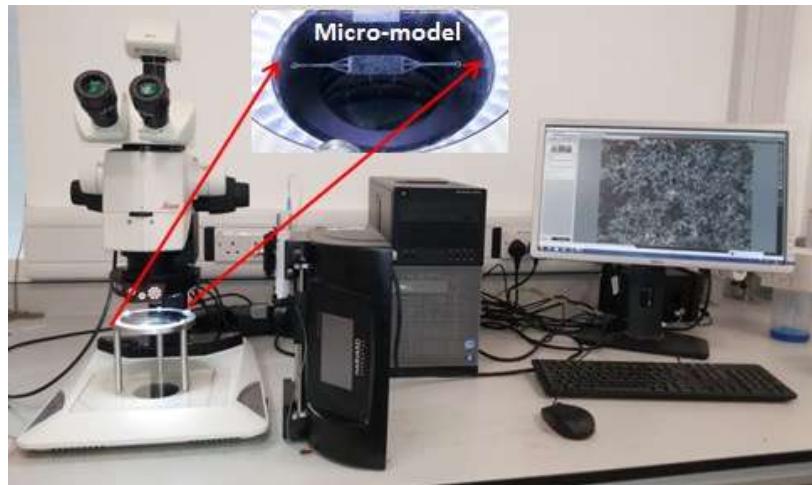
2) Darcy-scale experiments
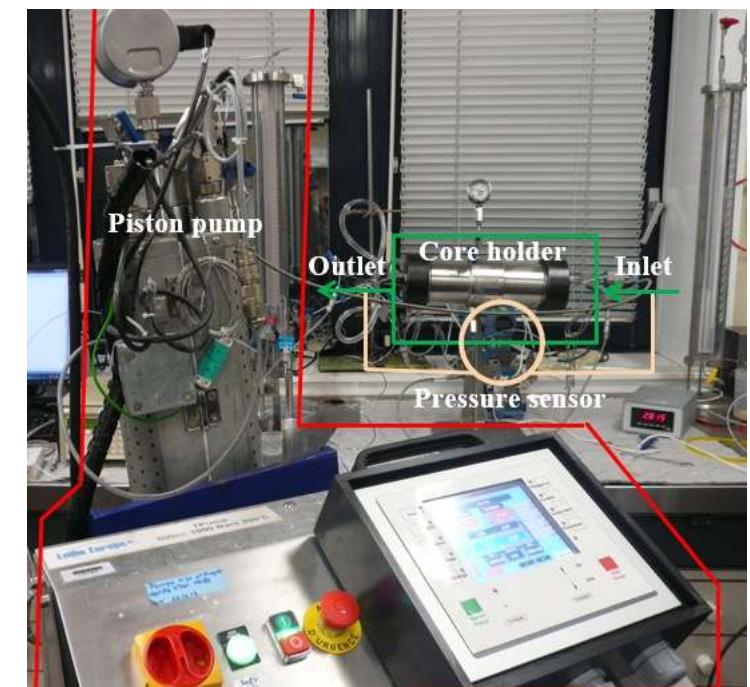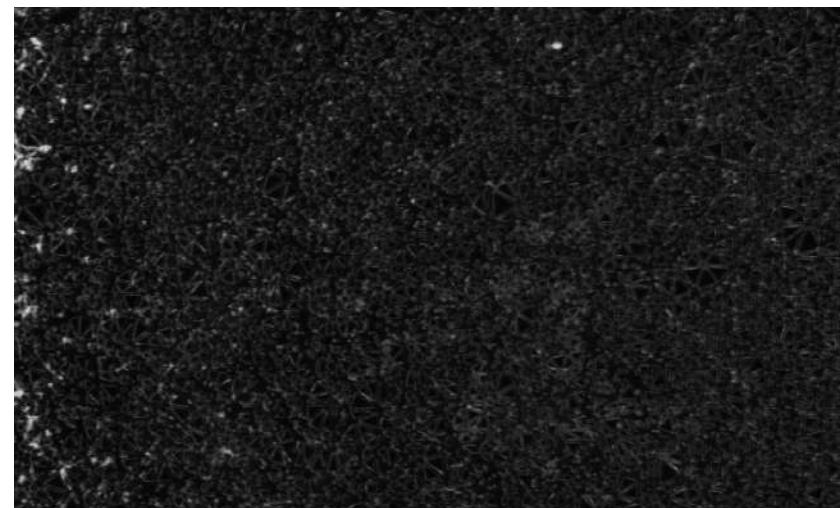
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Rodríguez de Castro, A., Oostrom, M., Shokri, N.: Effects of shear-thinning fluids on residual oil formation in microfluidic pore networks. Journal of Colloid and Interface Science 472, 34 – 43 (2016).

Shojaei, M. J., Rodríguez de Castro, A., Méheust, Y., Shokri, N.: Dynamics of foam flow in a rock fracture: Effects of aperture variation on apparent shear viscosity and bubble morphology, Journal of Colloid and Interface Science 552, 464 – 475 (2019).

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ParisTech – CSC PhD Program

Laboratoire d'Ingénierie des Fluides et des Systèmes Énergétiques - LIFSE

Ingénierie des Fluides Systèmes Énergétiques

Research domain(s): The LIFSE's main research areas revolve around hydrodynamics, aerodynamics, acoustics, thermics and thermodynamics, implemented for the turbomachines development as well. These research areas are a part of the renewable energy fields, sustainable mobility, aerospace, processes and health.

Turbomachines	Topic leaders	Dr Amélie DANLOS Pr Sofiane KHELLADI
Energy systems and thermal management	Topic leaders	Dr Michael DELIGANT Dr Christelle PERILHON
Multi-species flows and rheology	Topic leaders	Pr Farid BAKIR Dr Mathieu SPECKLIN
Physical aero-hydrodynamics	Topic leaders	Dr Florent RAVELET Dr Michael PEREIRA

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Ingénierie des Fluides
Systèmes Énergétiques
LIFSE

RESEARCH INFRASTRUCTURES
(Confluence Platform)

Liquid piston compressor

Acoustics facilities

Name

PIV measurement

ORC Turbine facilities

Component design codes

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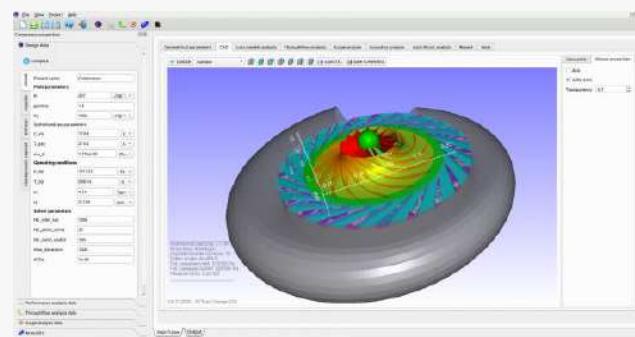
KEY FACTS / FIGURES

9 researchers / 16 lecturers
(including 80% of international researchers /
37% of teacher-researchers)
24 doctoral students including 75% of
international doctoral students

35-45 publications/year
50% international co-publications

22 patents

Ingénierie des Fluides Systèmes Énergétiques
Laboratoire
LIFSE

Sample typical research projects:

see more details on

https://lifse.artsetmetiers.fr/

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PROPOSALS/LABS 1/2

File number	School	Title	Advisors	Lab
2021_024	ESPCI Paris - PSL	Morphological Swarm Robotics	Olivier Dauchot	GULLIVER - Voyages expérimentaux et théoriques en matičre molle
2021_088	ESPCI Paris - PSL	Physics and algorithms for molecular modeling	Anthony Maggs	GULLIVER - Voyages expérimentaux et théoriques en matičre molle
2021_022	ESPCI Paris - PSL	Active Colloidal Gels	Olivier Dauchot	GULLIVER - Voyages expérimentaux et théoriques en matičre molle
2021_091	ESPCI Paris - PSL	Active liquid crystals: Controlling active flows through "smart confinement"	Teresa Lopez-Leon	GULLIVER - Voyages expérimentaux et théoriques en matičre molle
2021_002	Institut d'Optique Graduate School	Production of new striking visual appearance with disordered metasurfaces composed of random arrays of resonant nanoparticles.	Philippe Lalanne	LP2N - Laboratoire Photonique, numérique et nanosciences
2021_006	Institut d'Optique Graduate School	Dissipative strong coupling with non-Hermitian nanoresonators.	Philippe Lalanne	LP2N - Laboratoire Photonique, numérique et nanosciences
2021_020	Institut d'Optique Graduate School	High-power versatile GHz frequency combs for spectral and temporal domains applications	Eric Cormier, Giorgio Santarelli	LP2N - Laboratoire Photonique, numérique et nanosciences
2021_070	Institut d'Optique Graduate School	High sensitive Atom Interferometry using multi-photon interrogation in an optical cavity	Benjamin Canuel, Philippe Bouyer	LP2N - Laboratoire Photonique, numérique et nanosciences
2021_072	Institut d'Optique Graduate School	development of UV laser sources for applications in quantum physics	Adčle Hilico, Giorgio Santarelli	LP2N - Laboratoire Photonique, numérique et nanosciences
2021_090	Institut d'Optique Graduate School	Coherent dipole-dipole coupling of quantum emitters and manipulation of their degree of entanglement	Brahim Lounis, Jean-Baptiste Trebbia	LP2N - Laboratoire Photonique, numérique et nanosciences
2021_092	Institut d'Optique Graduate School	Exploring the optical properties of perovskite single nanocrystals and superlattices	Brahim Lounis, Philippe Tamarat	LP2N - Laboratoire Photonique, numérique et nanosciences
2021_093	Institut d'Optique Graduate School	Fast Josephson-junction control by optical manipulation of a flux quantum	Brahim Lounis, Philippe Tamarat	LP2N - Laboratoire Photonique, numérique et nanosciences
2021_057	Institut d'Optique Graduate School	Polarization sensitive single particle tracking and super-resolution microscopy in the near-infrared for brain imaging	Laurent Cognet	LP2N - Laboratoire Photonique, numérique et nanosciences

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File number	School	Title	Advisors	Lab
2021_007	ESPCI Paris - PSL	Novel two dimensional Rashba materials for spintronics.	Nicolas Bergeal, Sergio Vlaic	LPEM - Laboratoire Physique et d'études des matériaux
2021_041	ESPCI Paris - PSL	Hydrodynamics of electrons and phonons in bulk semimetals	Kamran Behnia	LPEM - Laboratoire Physique et d'études des matériaux
2021_058	ESPCI Paris - PSL	Bad metals and soft mode in the quantum paralectrics	Benoit Fauqué, Philippe Bourges	LPEM - Laboratoire Physique et d'études des matériaux
2021_060	ESPCI Paris - PSL	lectronic and Thermoelectrical properties of dilute metals	Benoit Fauqué, Kamran Behnia	LPEM - Laboratoire Physique et d'études des matériaux
2021_008	ESPCI Paris - PSL	Efficient and Stable Semi-Transparent Perovskite Solar Cells	Zhuoying Chen, Lionel Aigouy	LPEM - Laboratoire Physique et d'études des matériaux
2021_042	ESPCI Paris - PSL	Nanoparticles, Nanowire, and Nanosheets of Hybrid Perovskite Halides: From Synthesis to Applications	Zhuoying Chen, Alexei Chepelianskii, Miguel Monteverde	LPEM - Laboratoire Physique et d'études des matériaux
2021_104	ESPCI Paris - PSL	Nano-Rheology of Charged Solid/Liquid Interfaces	Jean Comtet	SIMM - Sciences et ingénierie de la matičre molle
2021_105	ESPCI Paris - PSL	Ionic transport at solid/liquid interfaces at the single charge scale	Jean Comtet	SIMM - Sciences et ingénierie de la matičre molle
2021_107	ESPCI Paris - PSL	Single Molecule Investigation of Polymer Chain Dynamics at Interfaces	Jean Comtet	SIMM - Sciences et ingénierie de la matičre molle

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COLLABORATION:

QUANTUMSPECS GROUP AND PHASME GROUP

NOVEL RASHBA MATERIALS FOR SPINTRONICS

ARPES chamber
Analyzer
Preparation chamber
Helium lamp
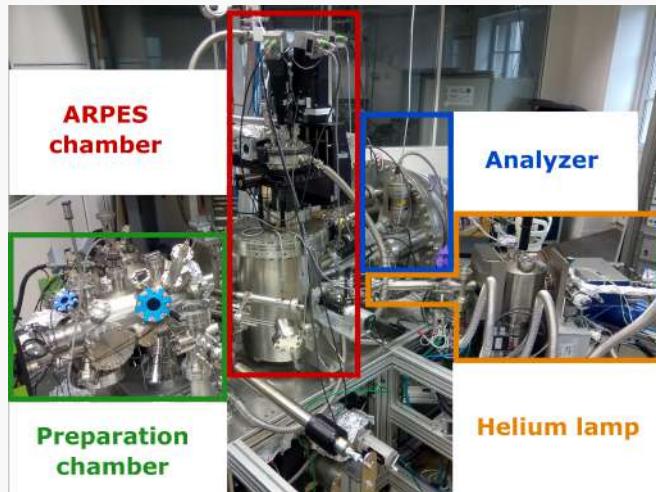
Material design: ultrathin (t < 2nm) PtGe alloy

Band structure: ARPES

Rashba states

$E-E_F$ [eV]

0

-0.5

$k_{//}$

Quantum Transport:

$R_c \rightarrow$

-200V
-100V
-60V
-40V
-20V
0V
+20V
+40V
+80V
+120V
+160V
+200V

R ($k\Omega$)

T(K)
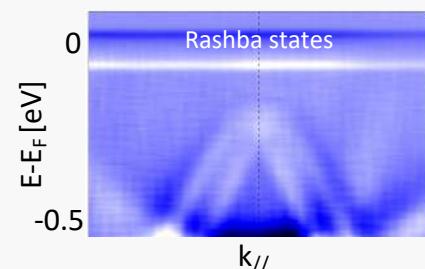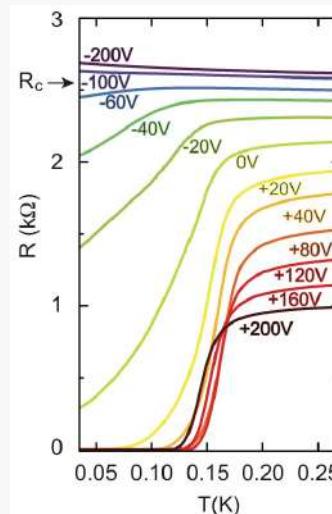
KEY RESEARCHERS QUANTUMSPECS / PHASME

SERGIO VLAIC   NICOLAS BERGEAL

More information:
https://qs.lpem.espci.fr/home
And
https://phasme.lpem.espci.fr/

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SOFT MATTER AT INTERFACES : *FROM THE NANOSCALE DOWN TO THE SINGLE MOLECULE LEVEL*
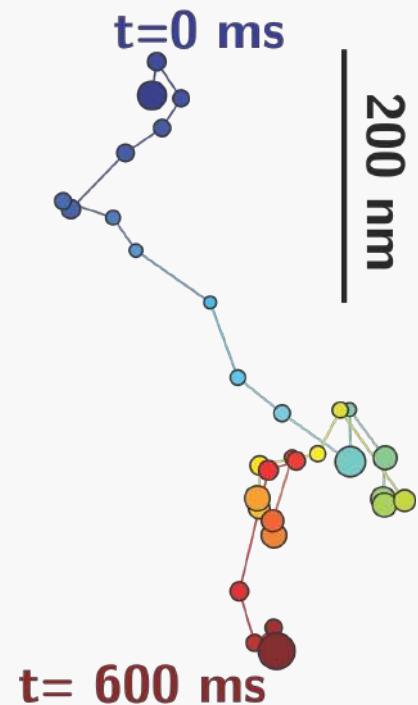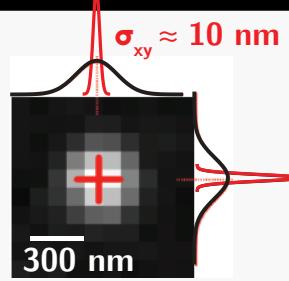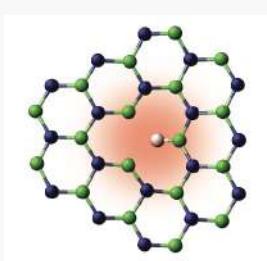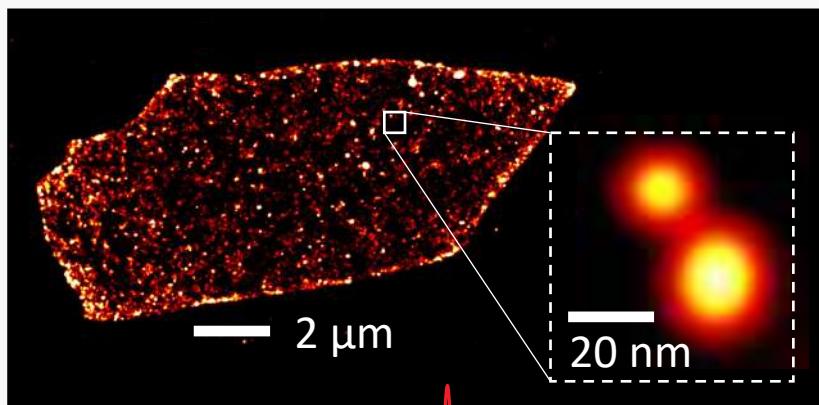
NanoRheology of Charged Solid/Liquid Interfaces
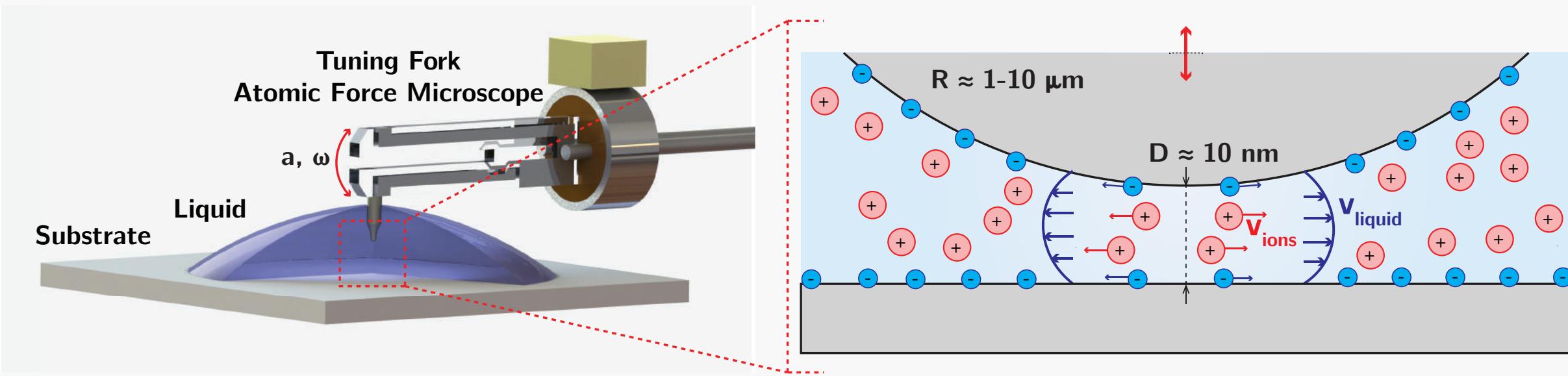
Proposal 104

→ Nanofluidic couplings between ionic and fluidic transport in the Electric Double Layer using dynamic Atomic Force Microscopy.

jean.comtet@espci.fr
https://blog.espci.fr/jcomtet/

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LP2N

Photonics, Numerical and Nanosciences Laboratory (LP2N) is a Joint Research Unit (UMR 5298) between the Institut d'Optique Graduate School, the University of Bordeaux and the CNRS.

Bordeaux Nanophotonics Group
Light in Complex Nanostructures (COS) group
"Cold Atoms in Bordeaux" (CAB) group
BioImaging & OptoFluidics group
Nano-BioMicroscopy team (NabLab)
Computational Imaging and Display Photonics systems

Laboratoire Photonique, Numérique et Nanosciences (LP2N)

Institut d'optique graduate school / LP2N (Bordeaux)

INSTITUT d'OPTIQUE
GRADUATE SCHOOL
ParisTech

Philippe Lalanne
(group leader)

group web page – google scholar (~20000 cites)

- **Nanocavities and resonant photonics (quasinormal mode theory)**

$Q \sim 10$
$V \sim 1\ \text{nm}^3$

picocavity

molecule
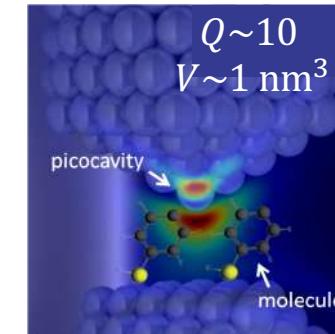
Recent selected publications

Laser Photonics Rev., **12**, 1700113 (2018).
Phys. Rev. Lett., **125**, 013901 (2020).
Nature, **576**, 248-252 (2019).

- **Optical metasurfaces for appearance design**

p ρ
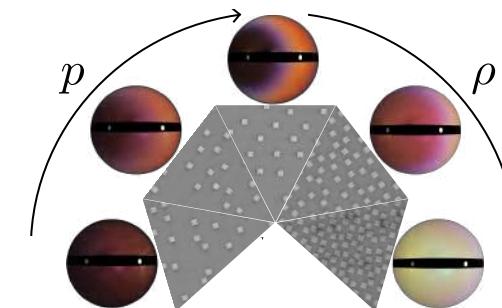
Many collaborations with top-world groups (e.g. Mark Brongersma – Stanford, Marin Soljačić – MIT, Min Qiu – Westlake)
Successful Chinese alumni:
Haito Liu (2006-08, 2011): Professor (优青), Nankai Univ., Tianjin, China.
Bing Wang (2007-09), Professor (青年千人), Huazhong Univ. of Sci. & Techn., Wuhan, China.
Jianji Yang (2009-15): Research Scientist, Applied Materials, California, USA.
Wei Yan (2016-19): Research Scientist, Institute of Advanced Technology, Westlake Univ., Hangzhou, China.

Fiber laser amplifier

Sr Rydberg transitions

Photonics Lasers and Applications group
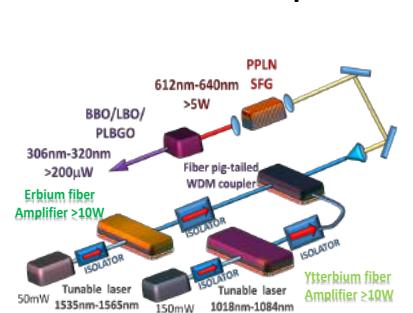
https://www.lp2n.institutoptique.fr/en/teams/photonics-systems
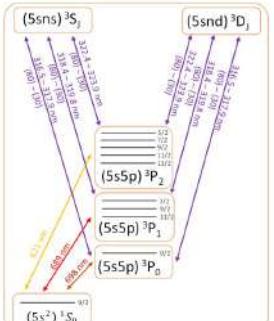
Tunable high power laser sources in the 300 to 320nm UV range are required for different applications, ranging from atmospheric physics to quantum computing. For these applications, high level of power as well as low noise figures are required (from hundreds to several Watt). This PhD thesis aims at developing new lasers sources based on nonlinear conversion (both resonant and non-resonant) of high-power laser sources in the Infrared range based on fiber lasers. A study of the noise characteristics and transfers will be pursued, to actively reduce it.

About the photonics group:
The team research activities are related to the development of different photonics systems, ranging from the generation and shaping of laser radiations, to their use for dedicated applications
• Low Noise High Power Fiber laser systems, within the frame of a Common Lab with the company Azurlight Systems.
• Electrooptics pulsed sources at GHz repetition rates
• Non linear photonics
• Control of the optical coherence properties
• Diagnostics and metrological studies

Laboratory:
LP2N - Institut d'Optique Graduate School, CNRS, University of Bordeaux,
Institut d'Optique d'Aquitaine, rue François Mitterrand, 33400 Talence
https://www.lp2n.institutoptique.fr/
adele.Hilico@u-Bordeaux.fr or adele.Hilico@institutoptique.fr

PhD. Project:
Polarization sensitive single particle tracking and super-resolution microscopy in the near-infrared for brain imaging.

Biophysics; Neurophotonics

Super-resolution Imaging

NanoBioMicroscopy group
www.cognet-research.com
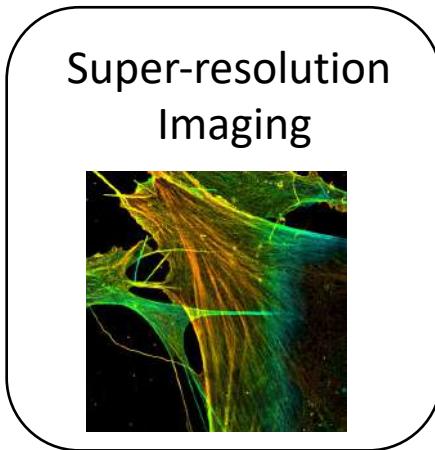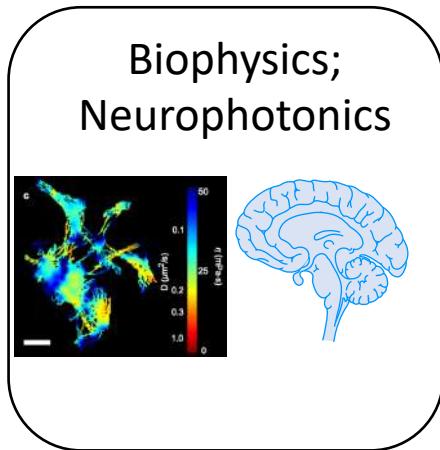
The objective of this PhD project is to develop an approach based on *single particle tracking microscopy and super-resolution microscopy* to resolve the fast rotational diffusion of nano-objects. The method will be based on the use of fluorescent carbon nanotubes implanted with color centers emitting in the near infrared and on the dynamic polarization analysis of these nanotubes at the single particle level.

About the NanoBioMicroscopy group:
We develop ultra-sensitive optical microscopy approaches, with emphasis on the detection of single nano-objects and super-resolution microscopy for applications in neuroscience
(*e.g. Science 07, Science 08, Science 10, Nat. Comm 16, Nat. Nanotechnol 17, Nat Methods 18, Adv. Science 2020, Nat. Com. 21*…).

Laboratory:
LP2N - Institut d'Optique Graduate School, CNRS, University of Bordeaux,
Institut d'Optique d'Aquitaine, rue François Mitterrand, 33400 Talence
https://www.lp2n.institutoptique.fr/
Laurent.Cognet@u-bordeaux.fr or Laurent.cognet@institutoptique.fr

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4. Labs and PhD proposals

ROOM 5 / MECHANICS AND FLUIDS

November 9 2021

File number	School	Title	Advisors	Lab
2021_044	Arts et Métiers	Fluid Dynamic Unsteadiness in Multiphase Turbomachinery	Antoine Dazin, Francesco Romano	LMFL - Laboratoire de mécanique des fluides de Lille
2021_048	Arts et Métiers	Single and Multiple Cavitating Bubbles near a Wall	Francesco Romano, Olivier Coutier-Delgosha, Antoine Dazin	LMFL - Laboratoire de mécanique des fluides de Lille
2021_081	Arts et Métiers	Physically informed and data-driven approaches towards reliable simulation of thermoplastic composite automotive components	Adil Benaarbia, Fodil Meraghni, Mourad Nachtane	LEM3 - Laboratoire d'étude des microstructures et de mécanique des matériaux
2021_015	Arts et Métiers	Development of guidelines tool to prevent the occurrence of plastic buckling in thin structures	Farid Abed-Meraim, Mohamed Ben Bettaieb	LEM3 - Laboratoire d'étude des microstructures et de mécanique des matériaux
2021_016	Arts et Métiers	Development of an advanced CPFEM tool for the prediction of formability limits of polycrystalline thin metal sheets	Farid Abed-Meraim, Mohamed Ben Bettaieb	LEM3 - Laboratoire d'étude des microstructures et de mécanique des matériaux
2021_017	Arts et Métiers	Development of an advanced numerical tool to predict the bendability limits during sheet metal forming processes	Farid Abed-Meraim, Mohamed Ben Bettaieb	LEM3 - Laboratoire d'étude des microstructures et de mécanique des matériaux
2021_062	Arts et Métiers	Smart and multiphysics solid-shell finite elements for the simulation of 3D thin structures	Farid Abed-Meraim, Hocine Chalal	LEM3 - Laboratoire d'étude des microstructures et de mécanique des matériaux
2021_064	Arts et Métiers	Forming limit predictions for porous materials in cold and warm sheet metal forming	Farid Abed-Meraim, Hocine Chalal	LEM3 - Laboratoire d'étude des microstructures et de mécanique des matériaux
2021_073	Arts et Métiers	Development of advanced multiscale computational tools for the multiphysics prediction of Carbon nanotubes (CNTs) fuzzy fiber composites	George Chatzigeorgiou, Fodil Meraghni, Adil Benaarbia	LEM3 - Laboratoire d'étude des microstructures et de mécanique des matériaux
2021_077	Arts et Métiers	Efficient computational framework to model size effects in miniaturized products	Farid Abed-Meraim, Mohamed Jebahi	LEM3 - Laboratoire d'étude des microstructures et de mécanique des matériaux
2021_076	Arts et Métiers	Multi-scale data-driven modelling of short-fibre reinforced composites for automotive applications	Fodil Meraghni, Francis Praud	LEM3 - Laboratoire d'étude des microstructures et de mécanique des matériaux
2021_087	ESPCI Paris - PSL	ULTRASONIC IMAGING OF SOFT GRANULAR MATERIALS AND BIOMEDICAL APPLICATIONS	Xiaoping Jia, Jean-Luc Gennisson	Institut Langevin

| File number	School	Title	Advisors	Lab
2021_061	Arts et Métiers	Improving formability of lightweight metallic materials using process chaining: Incremental Forming and Friction Stir Welding	Philippe Dal Santo, Idriss Tiba, Sandra Chevret, Tudor Balan	LAMPA - Laboratoire angevin de mécanique, procédés et innovation
2021_098	Arts et Métiers	Phase field modeling of damage and fracture in polycrystalline materials under thermomechanical loading	Amine Ammar, Saber El Arem	LAMPA - Laboratoire angevin de mécanique, procédés et innovation
2021_100	Arts et Métiers	Nonlinear dynamics of cracked structures: aplication to wind turbines	Amine Ammar, Saber El Arem, Adil El Baroudi	LAMPA - Laboratoire angevin de mécanique, procédés et innovation
2021_109	Arts et Métiers	Reconstruction of heterogeneous surface residual-stresses in polycrystalline materials from X-ray diffraction measurements	Chedly Braham, Leo Morin	PIMM - Laboratoire Procédés et ingénierie en mécanique et matériaux
2021_009	Ecole des Ponts ParisTech	Controlling hygrothermics of biobased construction material	Philippe Coussot, Patrick Huber	Laboratoire NAVIER (mécanique, physique des matériaux et des structures, géotechnique)
2021_010	Ecole des Ponts ParisTech	Gas transfer in the compacted bentonite-based materials	Yujun Cui	Laboratoire NAVIER (mécanique, physique des matériaux et des structures, géotechnique)
2021_019	Arts et Métiers	Measurement of residual stresses in materials: FEM-based simulation of X-ray diffraction	Dorian Depriester, Laurent Barrallier	MSMP - Laboratoire Mécanique, Surface, Matériaux et Procédés
2021_034	Arts et Métiers	Multiscale stress/strain analysis of polycrystalline silicon for photovoltaic applications	Laurent Barrallier	MSMP - Laboratoire Mécanique, Surface, Matériaux et Procédés
2021_036	Arts et Métiers	Thermal and mechanical fatigue behavior of selective laser melting maraging steel (H11 or H13)	Nan Kang, Mohamed El Mansori	MSMP - Laboratoire Mécanique, Surface, Matériaux et Procédés
2021_037	Arts et Métiers	Multi-scaled structure design of thermal controllable complex conforming cooling channel system in selective laser melting process	Mohamed El Mansori, Nan Kang	MSMP - Laboratoire Mécanique, Surface, Matériaux et Procédés
2021_038	Arts et Métiers	Mechanical and Functional fatigue behavior of selective laser melted NiTi Shape Memory Alloy	Mohamed El Mansori, Mourad El Hadrouz	MSMP - Laboratoire Mécanique, Surface, Matériaux et Procédés
2021_040	Arts et Métiers	Optimized set-up to characterize the contact fatigue damage of material with gradient properties	Jean-Patrick Goulmy, Laurent Barrallier	MSMP - Laboratoire Mécanique, Surface, Matériaux et Procédés

PARISTECH – CSC PHD PROGRAM

NAVIER LABORATORY

RESEARCH AT NAVIER LABORATORY

- **Mechanics** and **physics of materials**, **structures** and **geomaterials** and their **applications** to **geotechnics**, **civil engineering**, **transport**, **geophysics** and **energy**
- **Experimental** and **theoretical** studies based on a vast array of equipment, some being unique in their kind

4 research teams, 60 permanent researchers, 90 PhD students

Rheophysics and porous media research team

Research axis:
Yield stress fluids
Transfers in porous media
Rheophysics

Philippe COUSSOT
Researcher
Professor at Ecole des Ponts ParisTech

PhD title: Controlling hygrothermics of biobased construction material

Geotechnic (CERMES) research team

Research axis:
Unsaturated soils
Storage of radioactive waste
Railway geotechnics
Soil-atmosphere interaction

Yu Jun CUI
Researcher
Professor at Ecole des Ponts ParisTech

PhD title: Gas transfer in the compacted bentonite-based materials

RESEARCH INFRASTRUCTURES

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PARISTECH – CSC PHD PROGRAM

MSMP/ ARTS ET MÉTIERS
MECHANICS, SURFACES AND MATERIALS PROCESSING

DIRECTOR: MOHAMED EL MANSORI
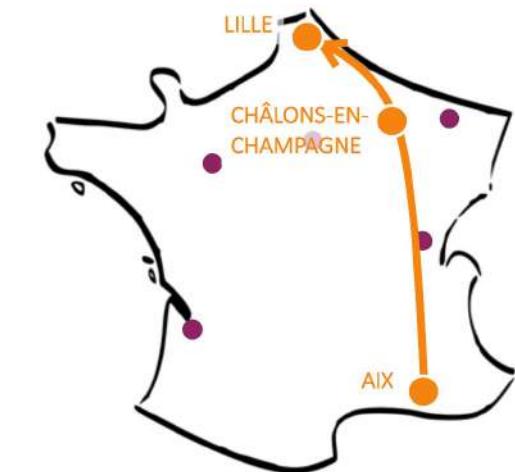
KEY FACTS / FIGURES

Number of teacher-researchers : 33 (20% international)
Number of PhD candidates : 11 including 25 % of international PhD candidates
Number of engineers & administratives :10
Number of post-docs: 2

Number of publications > 200

Number of filed patents > 5

Prestigious partnerships with academic laboratories, companies:

SAFRAN   AIRBUS   lisi AUTOMOTIVE

eDF   RENAULT   STELLANTIS

ESSILOR
SEEING THE WORLD BETTER
thyssenkrupp
SIEMENS
Ingenuity for life
Association INSTITUTS CARNOT

TEXAS A&M
UNIVERSITY at QATAR
NORTHWESTERN POLYTECHNICAL UNIVERSITY 1938
l'Europe s'engage en France
FULBRIGHT
VISITING SCHOLAR PROGRAM

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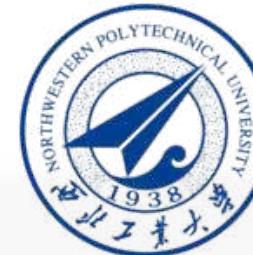
I2MP PhD projects:

Prof. Mohamed El Mansori
https://www.researchgate.net/profile/Mohamed-El-Mansori

Nan Kang – Associate Professor
https://www.researchgate.net/profile/Nan-Kang-7

Mourad El Hadrouz – Associate Professor
https://www.researchgate.net/profile/Mourad-El-Hadrouz

Subject 36
Thermal and Mechanical Fatigue behaviour of selective laser melting maraging steel (H11 or H13)
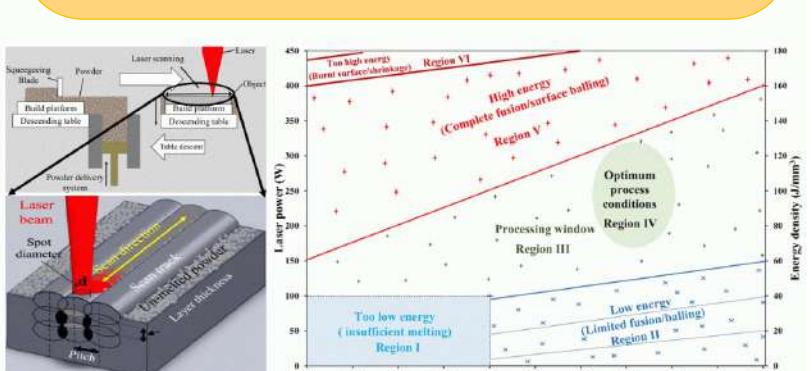
Subject 37
Multi-scaled structure design of thermal controllable complex conforming cooling channel system in selective laser melting process

Subject 38
Mechanical and Functional Fatigue behavior of selective laser melted NiTi Shape Memory Alloy

Conformal Cooling Systems (CCS)

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Some MMS PhD projects:

Optimized set-up to characterize the contact fatigue damage of material with gradient properties

Subject 40

Dr Jean-Patrick Goulmy
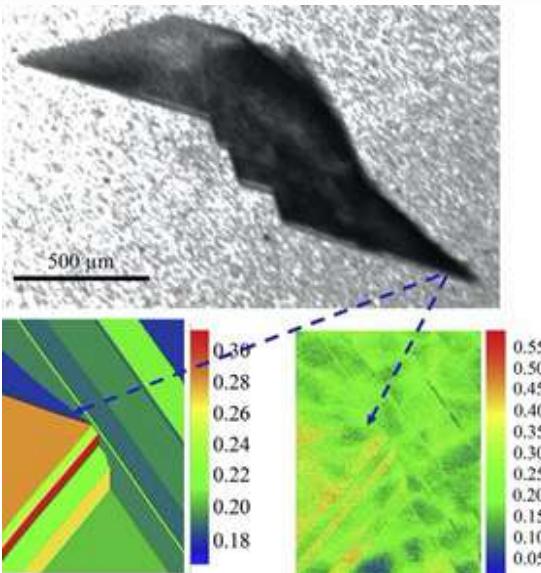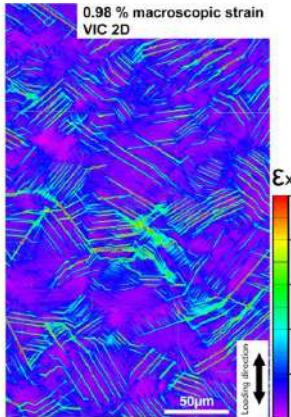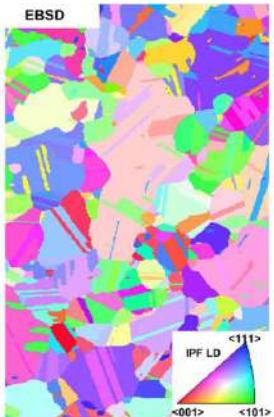
Measurement of residual stresses in materials: FEM-based simulation of X-ray diffraction

Subject 19

Dr. Dorian Depriester

Multiscale stress/strain analysis of polycrystalline silicon for photovoltaic applications

Subject 34

Pr. Laurent Barrallier
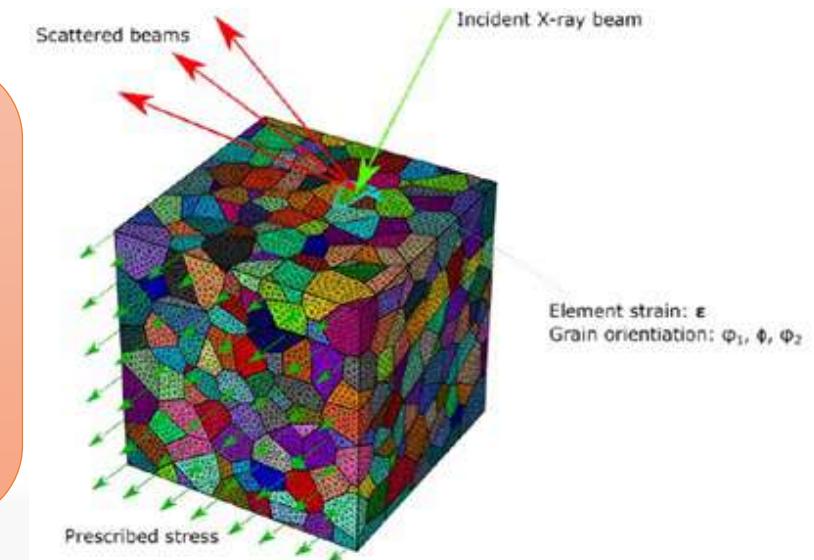
Research domains MMS : Optimization of the microstructure to improve the performance of mechanical parts
From the microstructure to the mechanical properties of materials

AXIS 1: Mechanics of the surfaces and materials with microstructure gradient

AXIS 2: Residual stresses generation and mechanical fields

AXIS 3: Thermochemical and mechanical surface treatments

Diffraction methods for the mechanical states analysis

Full kinematic field measurements / mechanical tests, identification methods

Digital materials
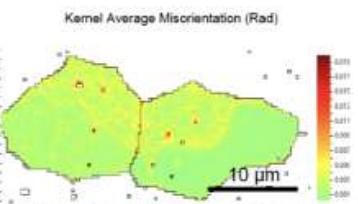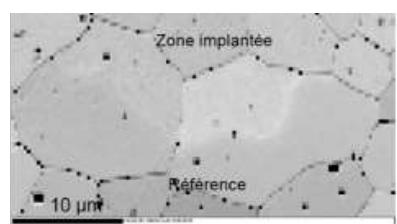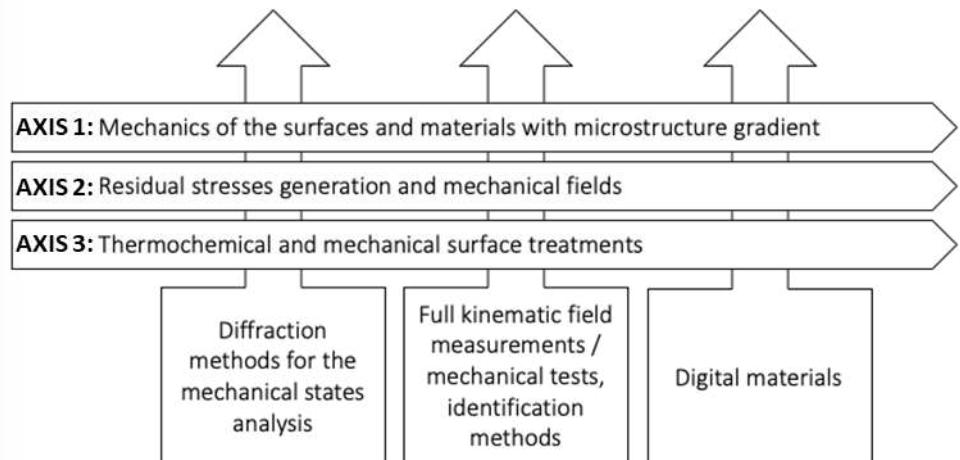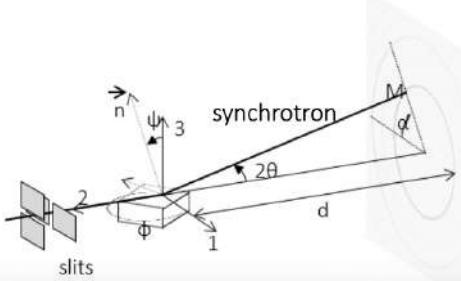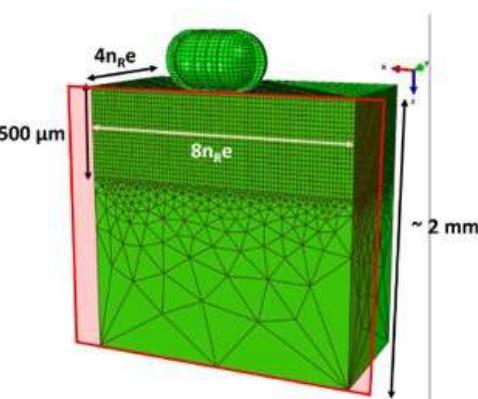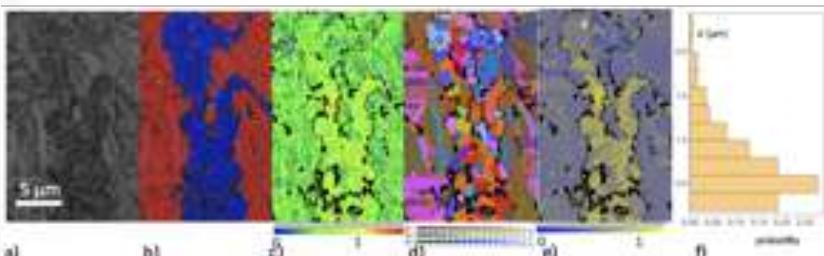
Some application fields:
- Nuclear Energy (UO2), mechanical behavior, irradiation effect \ CEA
- Shot peening (15 PhD thesis): from the mechanical surface treatment to the fatigue life \\ PSA, Safran, AREVA, EDF, INSA, UTT, Onera
- Nitriding (11 PhD thesis): from the process parameters to the use \\ Airbus, Safran, Aubert & Duval, Bodycote, Transvalor, DTU
- Diffraction method for mechanical states analysis (X-ray, neutron, synchrotron, electron)
- ...

HREBSD

Gases reactive facilities   SEM   Mono impact   X-ray diffractometer   Dig.mat.   p.14

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LABORATOIRE DE MÉCANIQUE DES FLUIDES DE LILLE

ARTS ET MÉTIERS, CAMPUS OF LILLE

Research domain(s): Turbulence, Rotating Flows, Flight Dynamics in Unsteady and Non Uniform Environments

Turbulence:
study and model turbulent flows

Team leader

Christos VASSILICOS

Rotating Flows:
analysis and modeling of internal or external flows linked to rotating machines

Team leader

Antoine DAZIN

Flight Dynamics:
development of tools and methods to determine dynamics of aircrafts flying

Team leader

Olivier RENIER
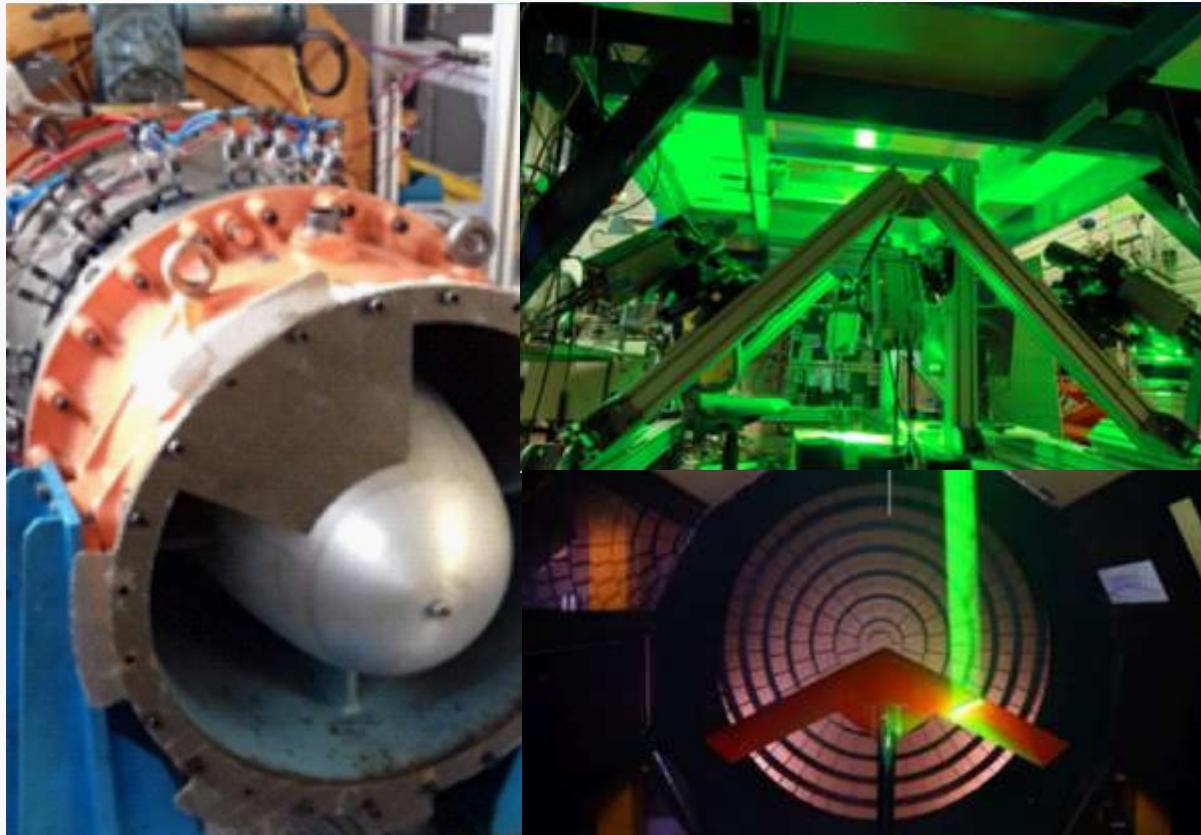
Laboratoire de Mécanique des Fluides de Lille
Kampé de Fériet

KEY FACTS / FIGURES

38 permanent people (researchers, research professors, engineers and technicians) and about 25 non-permanent researchers (doctoral students and post-doctocs).

Partnerships with academic laboratories (universities, research organizations), companies (logos)

VT VIRGINIA TECH

SAFRAN

19 publications in high-impact international journals during 2020
List of publications:
https://lmfl.cnrs.fr/en/articles_en/

Imperial College London

ariane GROUP

ÉuHIT

LMFL is a member of EUHITT : Euopean Consortium that aims at integrating cutting-edge European facilities for turbulence research

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European Project ACONIT : Design and test high level actuators for flow control in aeronautical compressors. https://aconit.ensam.eu/
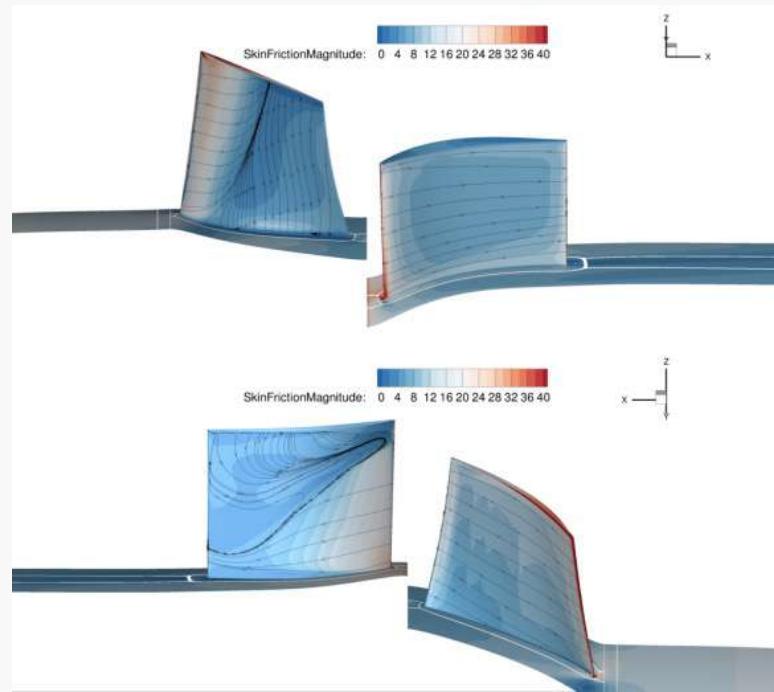
CFD in an axial compressor

ANR Project EXPLOIT : Experimental study of **dissipative structures in Turbulence**. https://lmfl.cnrs.fr/actualite/campagne-de-mesure-4d-ptv-dans-le-projet-anr-exploit/
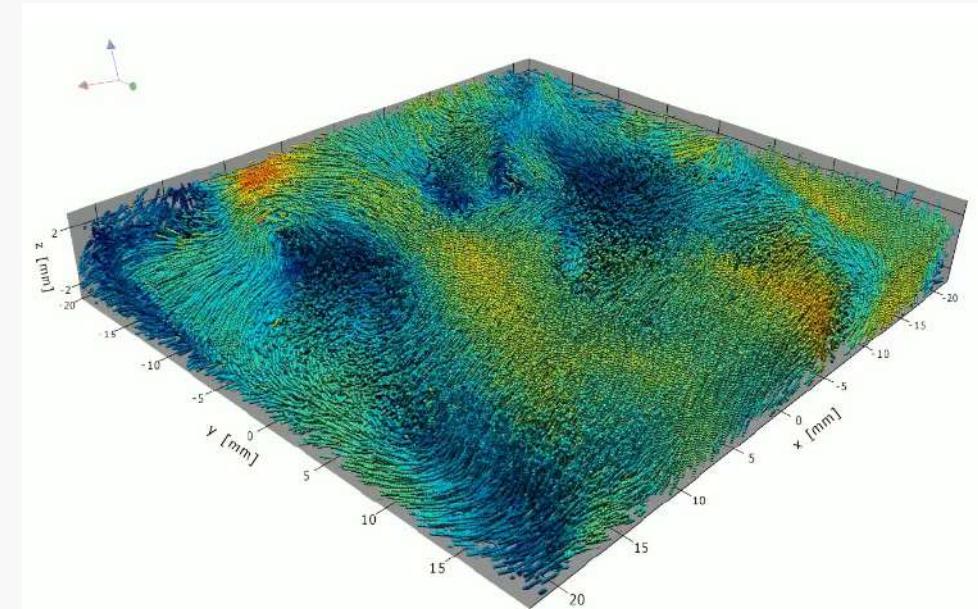
High speed, high resolution PTV results of a turbulent flow

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ParisTech – CSC PhD Program

Laboratoire d'Etude des microstructures et de mecanique des materiaux

(Microstructure Analysis and Mechanics of Materials)

http://www.lem3.fr/

Train 1h30

KEY FACTS / FIGURES

107 teacher-researchers / researchers + 20 foreign professors greeted per year

>80 doctoral students (>50% of international students)
16 post-docs

About 100 publications and international co-publications per year
2 reference books written by Pr Meraghni's team
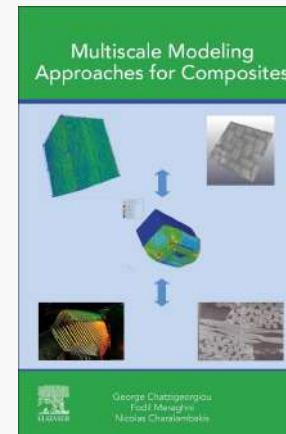
Number of filed patents : 7

Prestigious partnerships with academic laboratories and companies

Pr Meraghni's team : best paper award (SMSE, 2020)
Best PhD student Awards:
- Dr. D. Bouscaud (2013)
- Dr. W. Elmay (2015)
- Dr. E. Tikarrouchine (2019)

Research domain(s): Materials, Mechanics, Process – from elaboration to fatigue life (nuclear, aerospace, transportation, biodevices…)

Dept 1: MMSV
Mechanics of Materials, structures and living tissues

Team leader

Pr Hamid ZAHROUNI

Laboratory director

Dept 2: IMPACT
Microstructures engineering Processes, Anisotropy, Behavior

Team leader

Pr Nabila MALOUFI

Pr El Mostafa DAYA

Dept 3:T-PRIOM
Thermo-mechanics of Manufacturing Processes and Tool-Material Interactions

Team leader

Pr Sylvain PHILIPPON
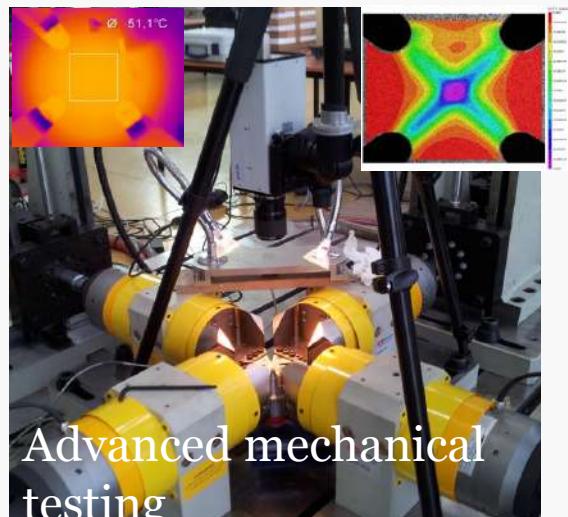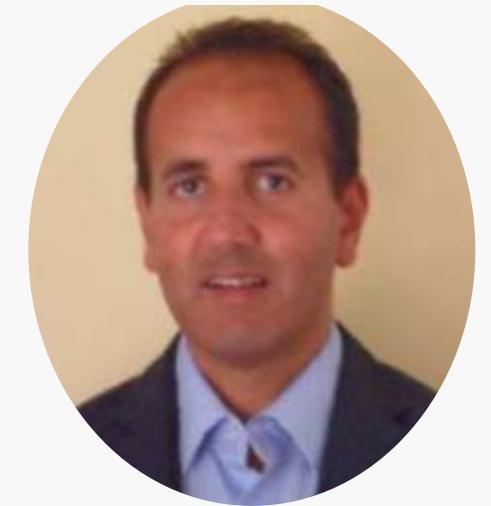
- Formulation of advanced solid-shell finite elements for the efficient and accurate simulation of thin 3D structures
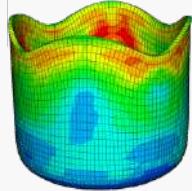
  - Finite element technology: hot and magnetic metal forming, multiphysics coupling...

    - Wang P., Chalal H., Abed-Meraim F. (2015), *Key Engng. Materials*, Vol. 651–653, 344–349.
    - Wang P., Chalal H., Abed-Meraim F. (2017), *Computational Mechanics*, Vol. 59, 161–186.
    - Wang P., Chalal H., Abed-Meraim F. (2017), *Composite Structures*, Vol. 172, 282–296.
    - Chalal H., Abed-Meraim F. (2018), *Materials*, Vol. 11(6), 1046.
    - Younas N., Chalal H., Abed-Meraim F. (2020), *Procedia Manufacturing,* Vol. 47, 1416-1423.
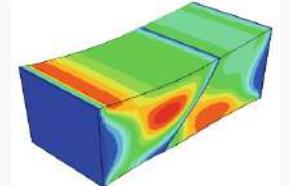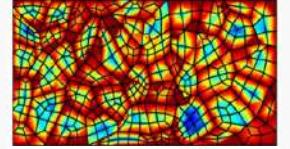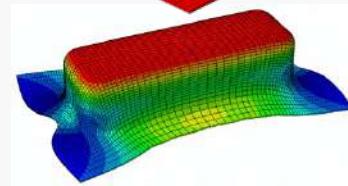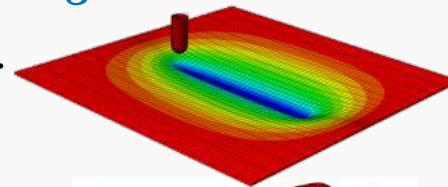
- Development of an efficient computational framework to model size effects in miniaturized products

  - Strain gradient crystal plasticity modeling: internal length scales, formability...

    - Jebahi M., Cai L., Abed-Meraim F. (2020), *Int. J. Plasticity*, Vol. 126, 102617.
    - Jebahi M., Forest S. (2021), *Continuum Mech. & Thermodynamics*, Issue 4.
    - Cai L., Jebahi M., Abed-Meraim F. (2021), *Crystals,* Vol. 11(10), 1235.
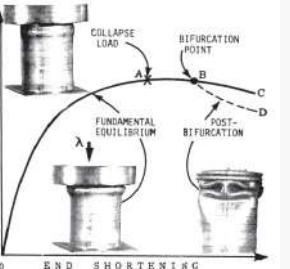
- Prediction of plastic instabilities in sheet metal forming: micromechanical and phenomenological approaches
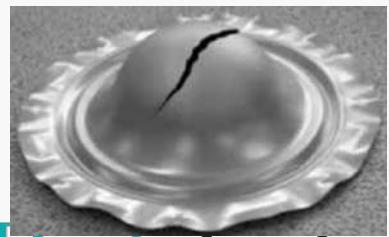
  - Computational modeling of: buckling, necking, strain localization, damage, fracture...

    - Ben Bettaieb M., Abed-Meraim F. (2015), *Int. J. Plasticity*, Vol. 65, pp. 168–190.
    - Akpama H.K., Ben Bettaieb M., Abed-Meraim F. (2017), *Int. J. Plasticity*, Vol. 91, 91, 205–237.
    - Zhu J.C., Ben Bettaieb M., Abed-Meraim F. (2020), *J. Mech. Physics Solids*, Vol. 143, 104042.
    - Jedidi M.Y., Ben Bettaieb M., Abed-Meraim F., *et al.* (2020), *Int. J. Plasticity*, Vol. 128, 102641.
    - Paux J., Ben Bettaieb M., Abed-Meraim F., *et al.* (2020), *Comput. Meth. Appl. Mech. Eng.*, Vol. 368, 113138.

• Multiscale fully coupled thermo-mechanical nonlinear modelling of dissipative materials
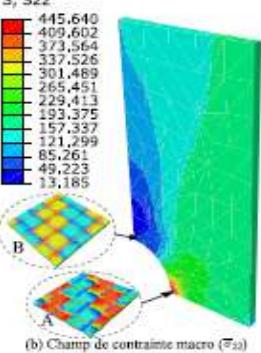
Periodic homogenization, mean-field approaches, FE² simulation, microstructure generation, …

- Tikarrouchine E, Chatzigeorgiou G, Chemisky Y, Meraghni F. *Int. J. Solids and Structures, 2019. 164 (2019), 120-140.*
- Benaarbia A, Chatzigeorgiou G, Kiefer B, Meraghni F. *Int. Journal of Mechanical Sciences, 2019; Vol 163:105128*
- Chen Q, Chatzigeorgiou G, Meraghni F. *International Journal of Solids and Structures, 2021, 210–211, 1–17.*
- Chen Q, Chatzigeorgiou G, Meraghni F. *Composites Science and Technology 2021; 215. 109012.*
- Chen Q, Chatzigeorgiou G, Robert G, Meraghni F. *Mech Mater 2021:104081.*
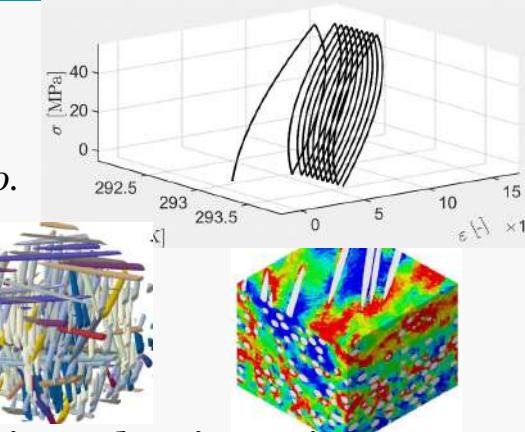
• Damage and phase field fracture investigation and modelling of composites in viscoelastic-viscoplastic regimes

Damage mechanisms investigation, mCT and SEM in-situ tests, generalized interface, …
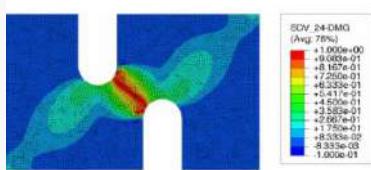
- Arif MF, Meraghni F, Chemisky Y, Despringre N, Robert G. *Composites Part B: Engineering*, 2014; Vol. 58: 487-95.
- Despringre N, Chemisky Y, Bonnay K, Meraghni F. *Composite Structures, 2016; 155: 77-88.*
- Chatzigeorgiou G, Meraghni F And Javili A. *Journal of the Mechanics and Physics of Solids, 2017; 106: 257-82.*
- Praud F, Chatzigeorgiou G., Meraghni F. *Int. Journal of Damage Mechanics, 2021, 30(2), pp. 163–195.*
- Miqoi N, Pomarede P, Meraghni F, Declercq NF *et. al., Int. J. Damage Mechanics, 2021, 30(2) pp. 323–348.*
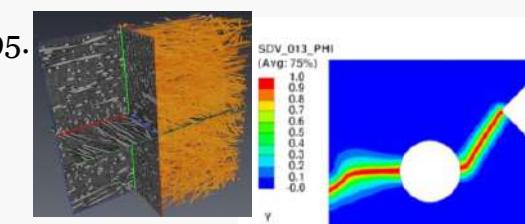
• Multifunctional and architectured materials for innovative applications

Shape Memory Alloys, High Entropy Alloys, Triply Periodic Minimal Surfaces, Additive manufacturing, …

- Chatziathanasiou D, Chemisky Y, Chatzigeorgiou G, Meraghni F. *Int. Journal of Plasticity, 2016; 82: 192-224*
- Chemisky Y, Hartl DJ, Meraghni F. *International Journal of Fatigue. 2018; 112:263–278.*
- Favre J, Lohmuller P, Piotrowski B, Kenzari S, Laheurte P, Meraghni F. *Additive Manufacturing. 2018; 21:359–68*
- Peltier L, Lohmuller P, Meraghni F, Berveiller S, Patoor E, Laheurte P. *Shape Mem Superelasticity 2020. 6(2), pp. 273-283*
- Peltier L, Berveiller S, Meraghni F, Lohmuller P, Laheurte P. *Shape Memory and Superelasticity, 2021. 7, pp. 194-205*
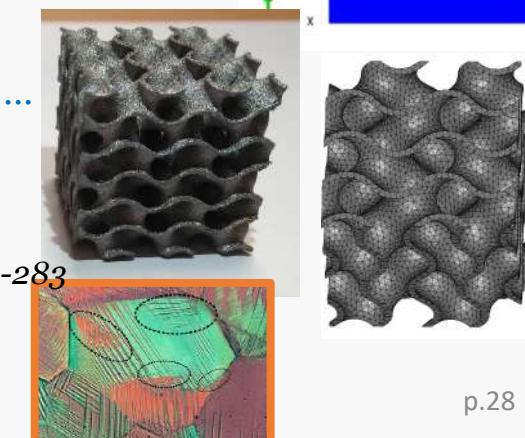
PROPOSALS FOR CSC PHD THESIS 2022

Pr. Meraghni's Team

1. Physically informed and data-driven approaches towards reliable simulation of thermoplastic composite automotive components (2021_081)

2. Multi-scale date-driven modeling of short-fibre reinforced composites for automotive applications (2021_076)

3. Development of advanced multiscale computational tools for the multiphysics prediction of carbon nanotubes (CNTs) fuzzy fiber composites (2021_073)

4. Phase field fracture modelling of shape memory alloy actuators for aerospace applications

Pr. Abed-Meraim's Team

1. Development of guidelines tool to prevent the occurrence of plastic buckling in thin structures (2021_015)

2. Development of an advanced CPFEM tool for the prediction of formability limits of polycrystalline thin metal (2021_016)

3. Development of an advanced numerical tool to predict the bendability limits during sheet metal forming prcesses (2021_017)

4. Smart and multiphysics solid-shell finite elements for the simulation of 3D thin structures (2021_062)

5. Forming limit predictions for porous materials in cold and warm sheet metal forming (2021_064)

6. Efficient Computational Framework to model size effects in miniaturized products (2021_077)

Any further information

sophie.berveiller@ensam.eu

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PROPOSALS/LABS 1/2

File number	School	Title	Advisors	Lab
2021_055	Arts et Métiers	Sensorless Control for Integrated Multiphase Drives applied to Transportation Systems Using Artificial Intelligence Potentiality	Ngac Ky Nguyen	L2EP - aboratoire d'Electrotechnique et électronique de puissance
2021_063	Arts et Métiers	Towards the definition of Industry 4.0 and 5.0 Key Performance Indicators	Nathalie Klement, Ali Siadat, Virginie Goepp	LISPEN - Laboratoire d'ingénierie des systčmes physiques et numériques
2021_068	Arts et Métiers	A decision aid system based on a decentralized architecture to faster the management of hazards occurring under production and logistics systems	Nathalie Klement, Esma Yahia, Lionel Roucoules	LISPEN - Laboratoire d'ingénierie des systčmes physiques et numériques
2021_074	Arts et Métiers	Learning with immersive technologies	Simon Richir, Geoffrey Gorisse, Sylvain Fleury	LAMPA - Laboratoire angevin de mécanique, procédés et innovation
2021_075	Arts et Métiers	Analysis, modeling and simulation of parametric resonances of piezoelectric structures. Application to nano-systems and energy harvesting	Olivier Thomas, Christophe Giraud-Audine, Simon Benacchio	LISPEN - Laboratoire d'ingénierie des systčmes physiques et numériques
2021_080	Arts et Métiers	Graph-based unbounded constrained models search for high-level logical reasoning	Jean-Philippe Pernot, Mathias Kleiner	LISPEN - Laboratoire d'ingénierie des systčmes physiques et numériques

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PROPOSALS/LABS 2/2

File number	School	Title	Advisors	Lab
2021_069	Institut d'Optique Graduate School	Improving super-resolved localization microscopes (PALM) in deep and heterogeneous samples with co-designed optimal phase masks	François Goudail	Laboratoire Charles Fabry
2021_046	Arts et Métiers	Integrated Virtual Simulation and Visualization of Manufacturing Processes using Numerical Simulation and Augmented Reality	Jose Outeiro, Jean-Rémy Chardonnet	LABOMAP - Laboratoire Bourguignon des matériaux et procédés
2021_045	Arts et Métiers	Development and optimization of tool design/geometry for drilling aerospace alloys using LCO2 and other environmentally friendly metalworking fluids	Jose Outeiro, Michael Deligant, Frédéric Rossi	LABOMAP - Laboratoire Bourguignon des matériaux et procédés
2021_082	Arts et Métiers	Sustainability assessment and multi-physical/multi-scale modelling of surface integrity in machining of Inconel 718 superalloy using advanced cutting tools materials	José Outeiro, Hélčne Birembaux, Aurélien Besnard	LABOMAP - Laboratoire Bourguignon des matériaux et procédés
2021_021	Arts et Métiers	Surface integrity of Ti-6Al-4V alloy components produced by SLM and machining processes: multiphysics simulations and experimental validation	Jose Outeiro, Abdelhadi Moufki	LABOMAP - Laboratoire Bourguignon des matériaux et procédés
2021_018	Arts et Métiers	Improvement of surface properties by PVD-Thermochemistry hybrid treatment on metal substrates obtained by conventional manufacturing processes and by powder metallurgy	Corinne Nouveau, Dominique Cotton	LABOMAP - Laboratoire Bourguignon des matériaux et procédés

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PARISTECH – CSC
PHD PROGRAM

Head of the lab : Pr. B. Lemaire-Semail

Key facts / figures / L2EP

124 members/
36 teacher-researchers
43 PhD candidates
15 Master, 16 post-docs

2018-2019:
95 journals, 168 International Congress, 2 patents, 3 books, 20 PhD Thesis

Industrial Partners:
Valeo, EdF, Thales, RTE, Siemens, PSA

Academic Partners: Universities Saitama, Harbin, Shandong, Beijing, Madrid, Valence, Seville, Aalto, Aalborg, Quebec, Mac Gill, Toronto, Akron, Florianopolis, Cordoba, Cluj, Sofia, Bruxelles, Lausanne, Alger, Sfax, Modène, Turin, Eindhoven

Lab's or staff's recent Awards
- H2020 EU project leader – PANDA (2018-2022)- MULTITOUCH (2019-2023)
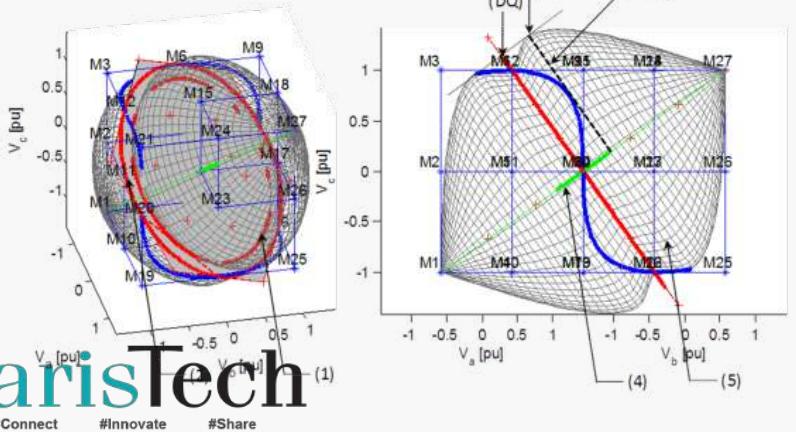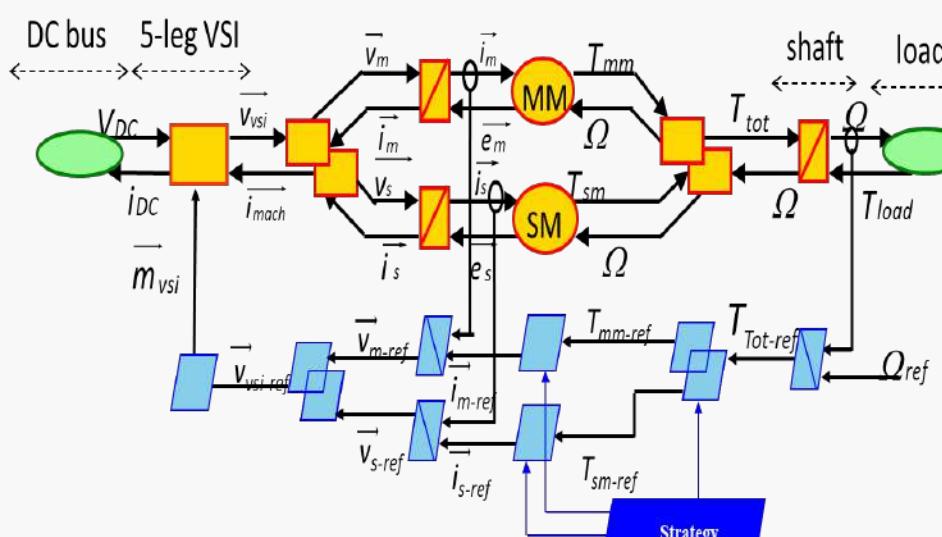
Numerical Tools and Method Team

Development of models for the optimal design and the study of electromagnetic systems in their environment

Stéphane Clénet
(researchgate.net/profile/Stephane_Clenet)
(117 Journals/136 International Congress)

Real device

Mathematical model

Optimisation

Numerical model

Quantities of Interest

https://code-carmel.univ-lille.fr/
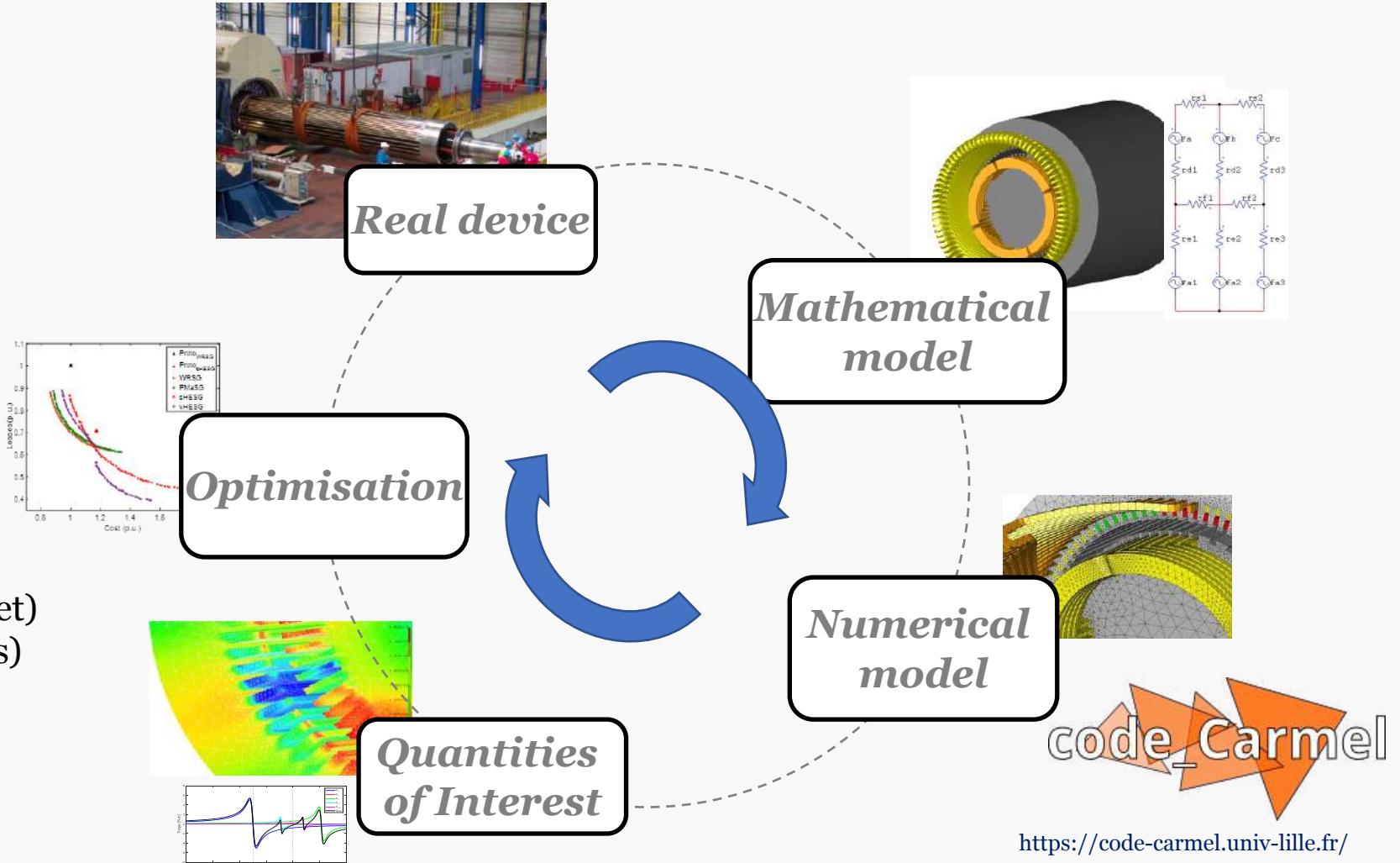
POWER SYSTEM TEAM

2 scientific skills

- ✓ **Transmission system and power electronics**
- ✓ **Smart grids**

Test of grid-connected hardware
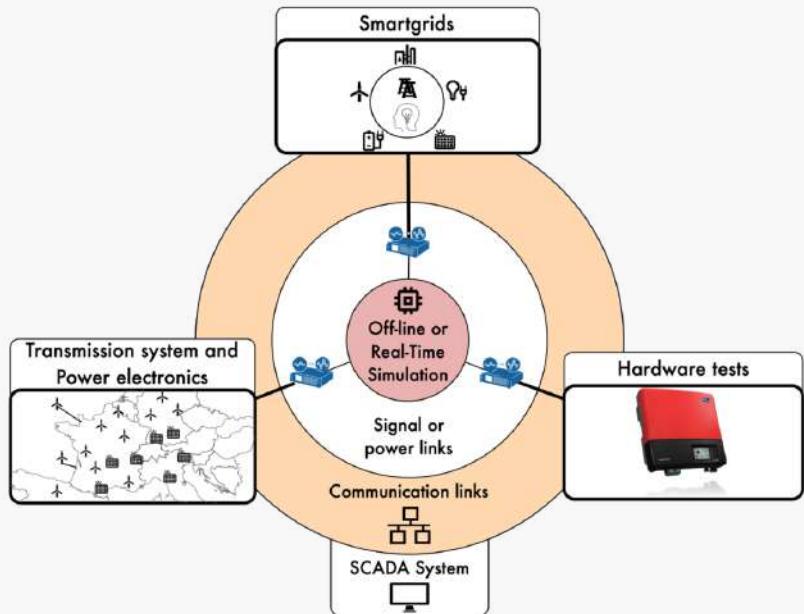
Dynamic simulation of large transmission grid incorporating modular Multilevel converters with internal storage system

Francois Gruson (orcid.org/0000-0003-0335-1116)
Xavier Kestelyn (orcid.org/0000-0002-8192-0743)
(46 journals/83 International Congress)
(3 Patents/ 4 book chapters/ 1 book)
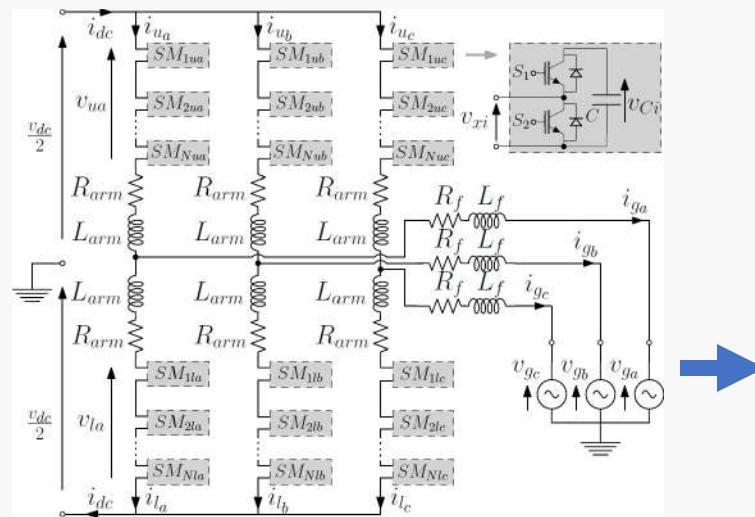
EPMLab Platform

From Theory to experiment

https://www.epmlab.eu/
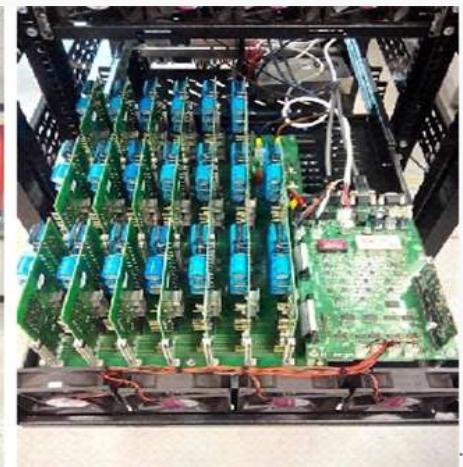
Sensorless Control for Integrated Multiphase Drives using Artificial Intelligence Potentiality

Supervisors : Ngac Ky Nguyen (ENSAM) and Jinlin Gong (Shandong University)

Scientific context:

Integrated Drives (Electrical machine with Power Electronic Converter INSIDE) are emerging thanks to the new high temperature and high frequency power components.

One major **challenge** is to **optimize** the volume and to **increase** the **fault-tolerance** of the Drive .

Mechanical position sensor is becoming not only a **hard space constraint** and also a supplementary **faulty source**

5-phase Inverter
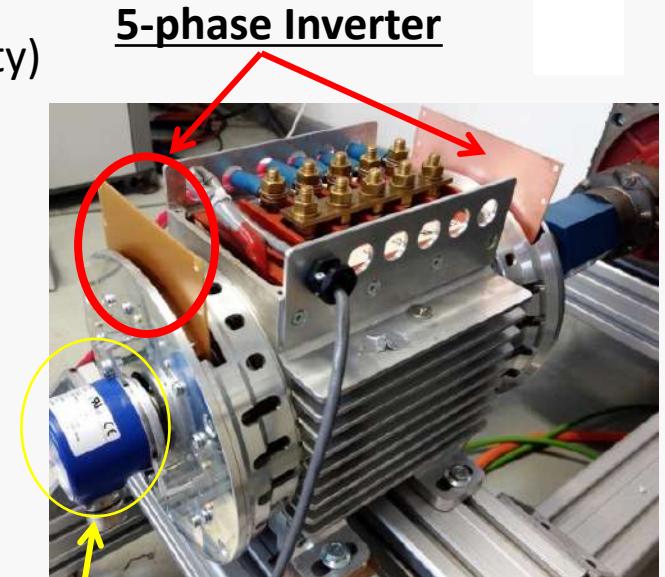
Position Sensor

5-phase CE2I prototype
Credit Source: L2EP

Objective of the PhD Thesis

- Using information given by **10 low cost position sensors** (Hall effect sensors) installed in the drive and **measured currents** could lead to a **good estimation** of the rotor position to **explore**
- **Big set of data** (10 sensors and 5 or 7 measured currents), **Artificial Intelligence** could be an interesting solution

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ParisTech – CSC PhD Program

Arts et Métiers
Sciences et Technologies

Laboratoire d'Ingénierie des Systèmes Physiques Et Numériques (LISPEN Laboratory)

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China Scholarship Council

lispen

Laboratoire d'Ingénierie des Systèmes Physiques Et Numériques

Research domain(s): Multi-physics, multi-scale and virtual dynamical systems for industry

Robotics, HRI, industrial engineering
Nonlinear dynamics and smart systems

Team leader

Richard Béarée

System engineering and digital model

Team leader

Lionel Roucoules

Virtual Immersion technologies and uses

Team leader

Frédéric Merienne

Laboratoire d'Ingénierie des Systèmes Physiques Et Numériques

Research domain(s): Multi-physics, multi-scale and virtual dynamical systems for industry

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Virtual Immersion technologies and uses

Team leader

Frédéric Merienne

LABORATOIRE D'INGÉNIERIE DES SYSTÈMES PHYSIQUES ET NUMÉRIQUES

RESEARCH INFRASTRUCTURES

Scalable 4.0 factory
(Lille)

Institut image
(Chalon-sur- Saône)

(Aix en Provence)

LABORATOIRE D'INGÉNIERIE DES SYSTÈMES PHYSIQUES ET NUMÉRIQUES

RESEARCH INFRASTRUCTURES

Lille

Scalable 4.0 factory
(Lille)

Institut image
(Chalon-sur- Saône)

(Aix en Provence)

Laboratoire d'Ingénierie des Systèmes Physiques Et Numériques
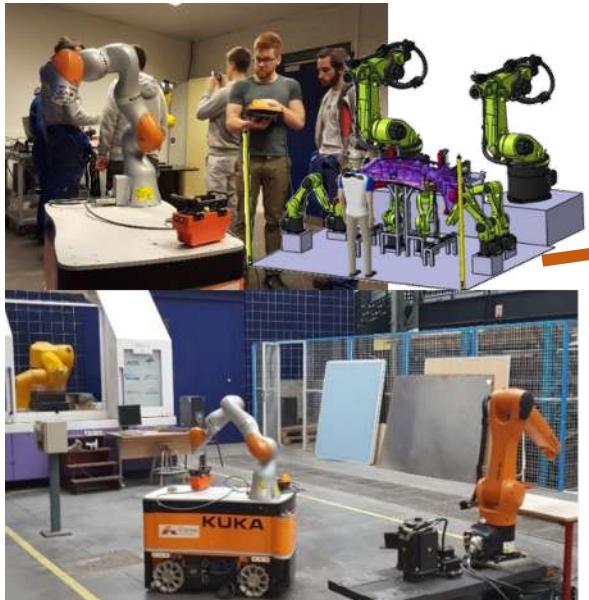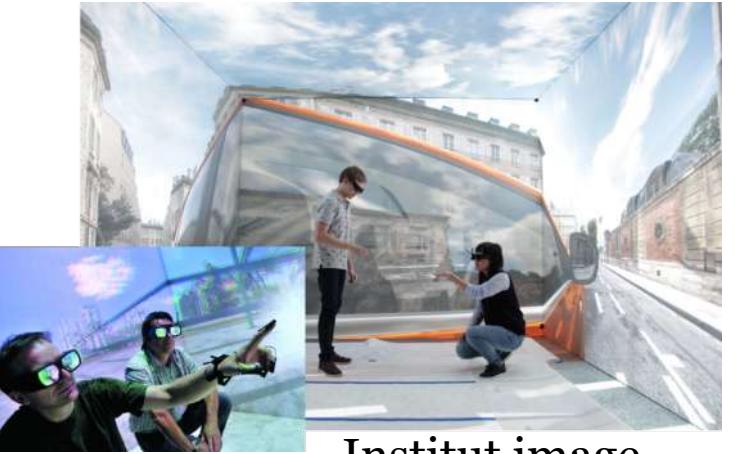
Key facts / figures

Number of researchers / teachers : 26
Number of doctoral students : 32 including
25% of international doctoral students
Number of post-docs : 4

Number of publications > 600
Number of international co-publications >40

Number of filed patents > 20

Prestigious partnerships with academic
laboratories (universities, research
organizations), companies (logos)

Lab's or staff's' recent Awards

- H2020 EU project leader – Colrobot 2015-2019
- Safran innovation award 2018

Laboratoire d'Ingénierie des Systèmes Physiques Et Numériques

Sample typical research projects :
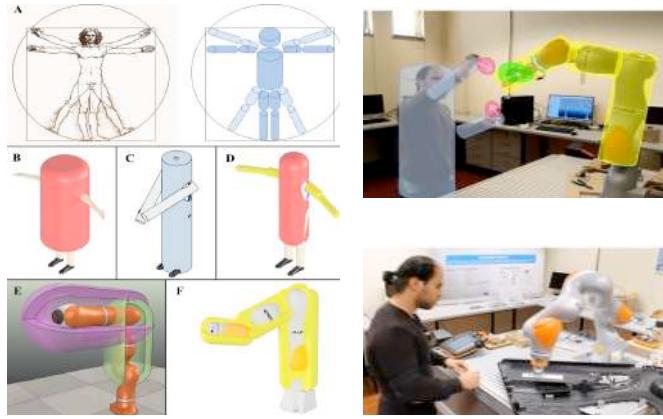
Mohammad Safeea's Joint PhD supervision with Univ. Of Coimbra (Portugal)

« *Safe Collaborative Robotic Manipulators* » 2017-2020

7 papers in top10 Robotic's journals;
4 communications in int. conf. (ICRA, IROS), 6 book chapters

Yuyang Wang – PhD granted by CSC

« *Smart navigation in virtual environment* »
2018-2021

1 paper (IEEE Access)
3 Communications in int. conf. (IEEE VR, ICITS)
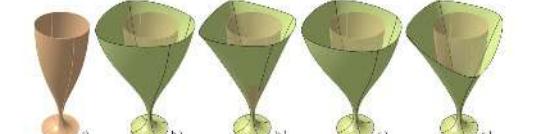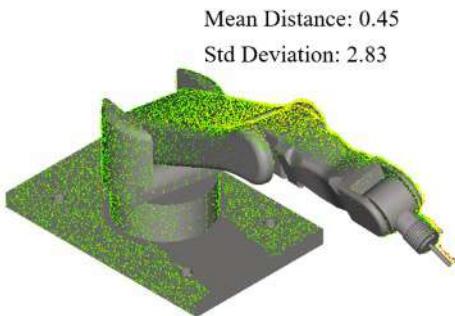
Hao HU – PhD granted by CSC

« *Over-constraints detection and resolution in geometric equation systems* »
2014-2017

1 paper (Computer Aided Design)

Sijie HU – PhD granted by CSC

« *Deep learning-based identification and fitting of CAD models from point clouds* »

2019 -

# Laboratoire d'Ingénierie des Systèmes Physiques Et Numériques

Nonlinear Dynamics & Vibrations / Smart Systems

◄ *Nonlinear automotive vibration absorbers*
2 PhDs +2 ongoing PhDs (2016-);
5 patents

Smart systems (vibration damping, energy harvesting, piezoelectric M/NEMS) ►
4 PhDs + 2 ongoing PhD (2015-)
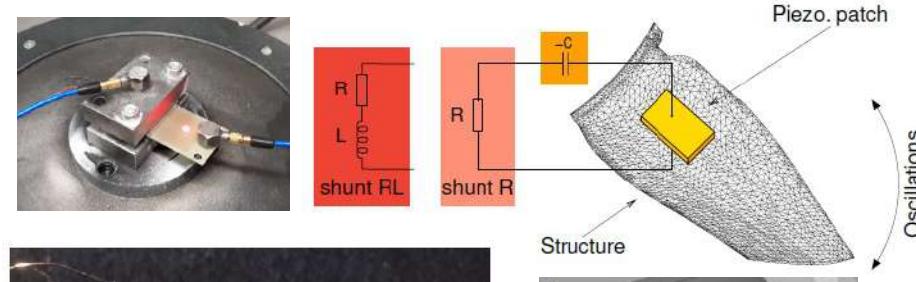
◄ *Highly flexible structures (nonlinear dynamics, stability)*
1 PhD +1 ongoing PhD (2020-)

* 10 papers per year in top 10 structural dynamics journals
* Experiments, theory, simulations

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