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PARISTECH – CSC PHD PROGRAM

- November 19, 2020 -





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WEBINAR GUESTS

AgroParisTech: Alexandre Péry, VP Research
AgroParisTech – URD ABI: Morad Chadni

Arts et Métiers Sciences et Technologies – LCFC: Ali Siadat
Arts et Métiers Sciences et Technologies – LaboMap: José Outeiro, Gérard Poulachon, Corinne Nouveau
Arts et Métiers Sciences et Technologies – L2EP: Ngac Ky Nguyen
Arts et Métiers Sciences et Technologies – LISPEN Lab: Richard Béarée, Jean-Philippe Pernot
Arts et Métiers Sciences et Technologies – L2M Bordeaux: Thierry Palin-Luc
Arts et Métiers Sciences et Technologies – LAMPA: Saber El Arem
Arts et Métiers Sciences et Technologies – Laboratoire de Mécanique des Fluides de Lille: Francesco Romano
Arts et Métiers – LEM3 Lab (SMART Research Group): Fodil Meraghni, Francis Praud
Arts et Métiers – MSMP: Dorian Depriester, Lorène Héraud
Arts et Métiers Sciences et Technologies – LIFSE: Smaine Kouidri
Arts et Métiers Sciences et Technologies – LISPEN: Pierre Garambois

Chimie ParisTech – PSL: Ilaria Ciofini, VP Research
Chimie ParisTech – PSL – IRCP: Thierry Pauporté
Chimie ParisTech – PSL – I-CLeHS: Carlo Adamo, Fanny d'Orlyé, Phannarath Phansavath, Frédéric Labat

Ecole des Ponts ParisTech – HM&Co : Auguste Gires, Pierre-Antoine Versini
Ecole des Ponts ParisTech – Laboratoire d'Hydraulique Saint-Venant: Sébastien Boyaval

ESPCI Paris – PSL: Costantino Creton, VP Research
ESPCI Paris – PSL – Gulliver Lab: Olivier Dauchot
ESPCI Paris – PSL – Institut Langevin: Xiaoping Jia, Claude Boccara
ESPCI Paris – PSL – LPEM: Stéphane Holé

MINES ParisTech – PSL – CEMEF: Tatiana Budtova, Charbel Moussa, Rudy Valette, Sijtze Buwalda
MINES ParisTech – PSL – PERSEE: Andrea Michiorri

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1. ParisTech introduction

IDENTITY

Identity
ParisTech is a consortium of prestigious **graduate engineering schools** that trains the country's future scientific and technical experts and executives.

Mission
Train leaders that can break down scientific and technological barriers to tackle major challenges, in particular global warming and sustainable development.

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Vision
Be the primary network of graduate schools in the fields of engineering, science and technology, both in France and worldwide.

Values
- Excellence
- Openness as a lever for growth
- Innovation
- Solidarity

Promise
Thanks to the excellence and complementary nature of their areas of teaching and research, the ParisTech schools form an outstanding network that provides tomorrow's top engineers with unique transdisciplinary opportunities and an ideal foundation for careers both in France and abroad.

Values
- Excellence: engineering, selective entry
- Openness as a lever for growth: international focus, diversity, sustainable development
- Innovation: research, entrepreneurship training, innovative teaching
- Solidarity: student support, flexible pathways and options, small class sizes, alumni networks

PARISTECH SCHOOLS

7

« Grandes Écoles »
In Engineering & Science

3

Campuses
Paris, Saclay, Marne-la-Vallée

AgroParisTech

Arts et Métiers Sciences et Technologies

Chimie Paris ParisTech | PSL

École des Ponts ParisTech

ESPCI PARIS | PSL
EDUCATION SCIENCE INNOVATION

INSTITUT d'OPTIQUE GRADUATE SCHOOL ParisTech

université PARIS-SACLAY

MINES ParisTech | PSL

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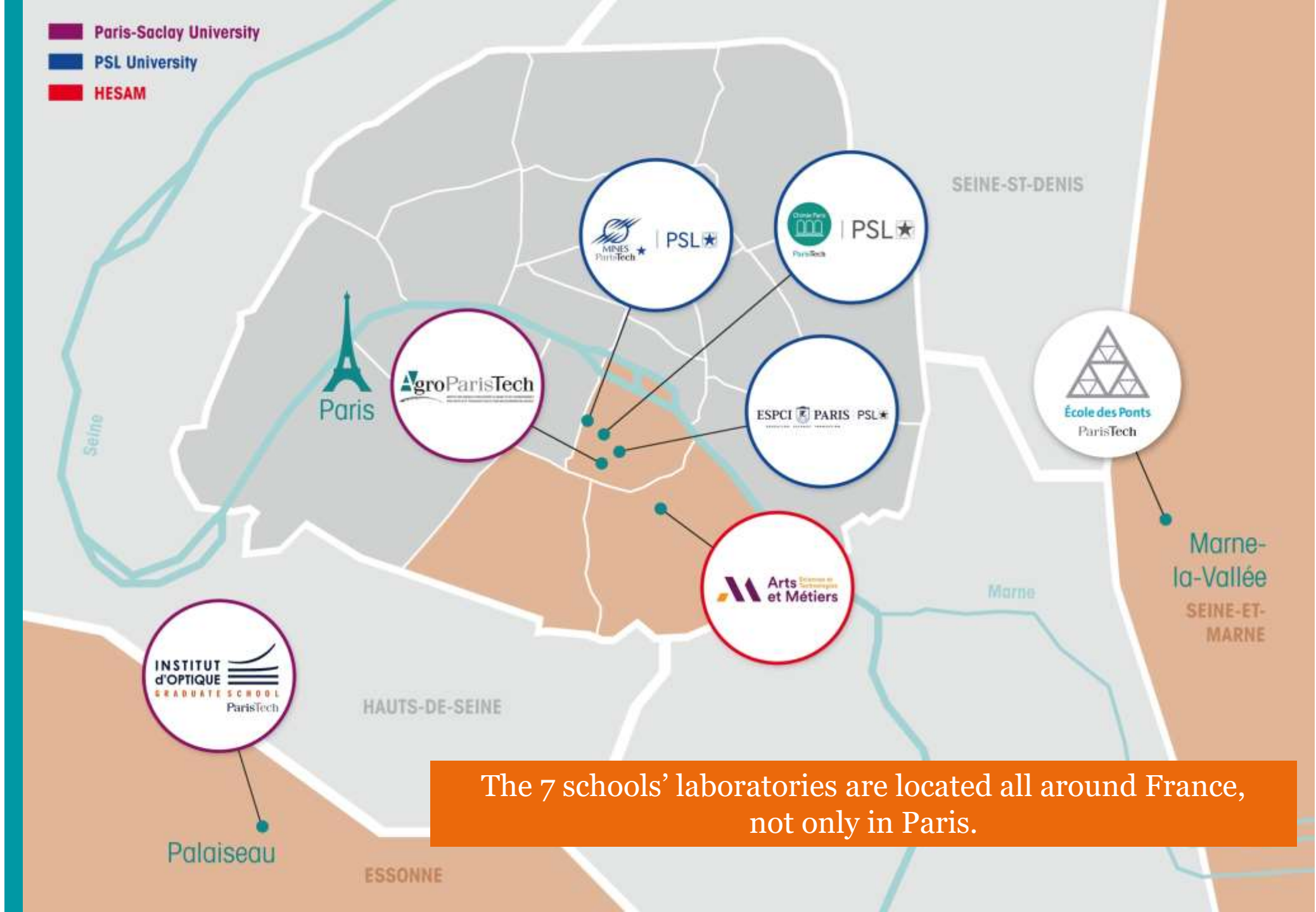
7

GRADUATE SCHOOLS IN PARIS

3

CAMPUSES



The 7 schools' laboratories are located all around France, not only in Paris.

KEY NUMBERS

12 000
students

1 500
PhD candidates

1 500
professors

120
partner companies

90 000
alumni

68 international agreements

56 teaching and research chairs

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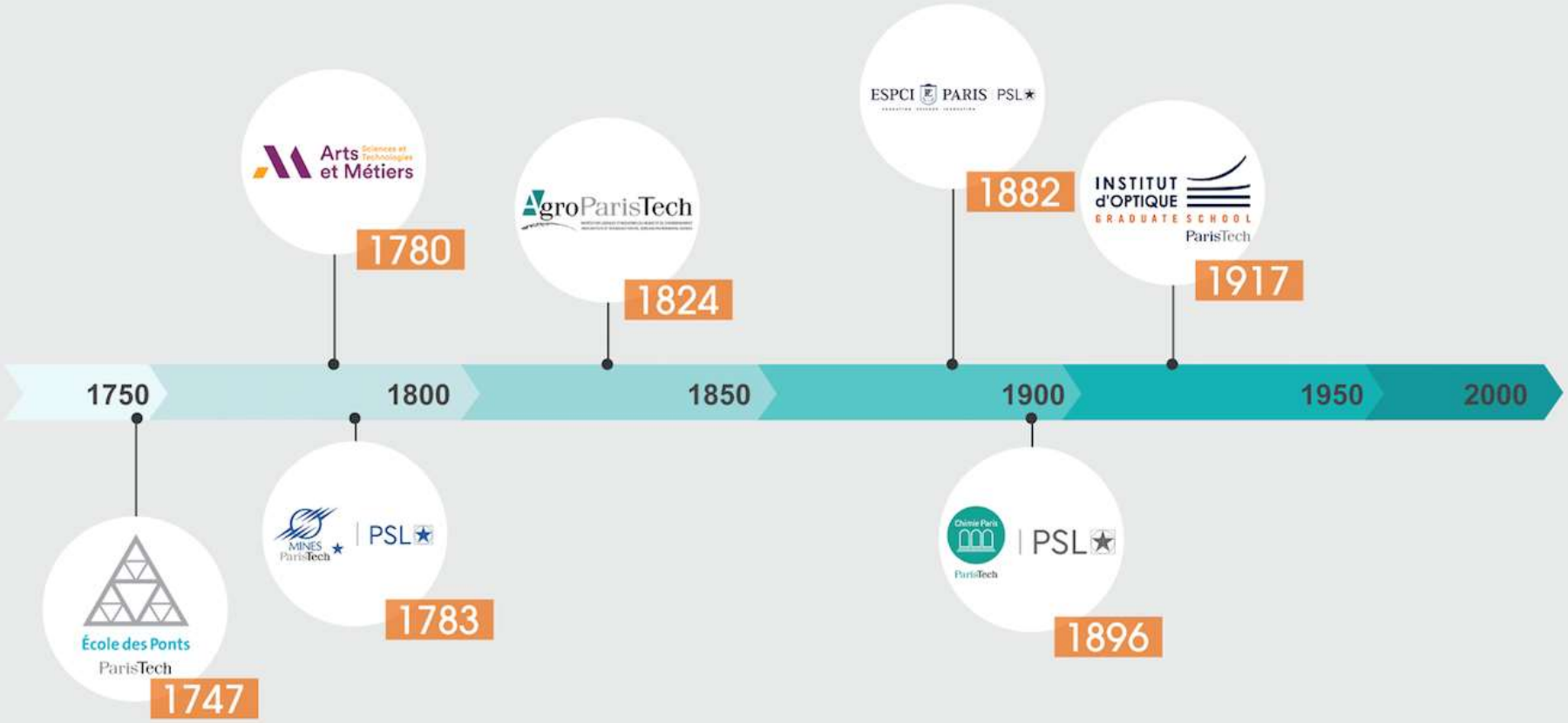
PARISTECH PARTNER UNIVERSITIES IN CHINA

- **Beijing**: Tsinghua University, Peking University, China Agricultural University
- **Hangzhou**: Zhejiang University
- **Hefei**: University of Science and Technology of China
- **Nanjing**: Nanjing University, SouthEast University, Nanjing Agricultural University
- **Shanghai:** Shanghai Jiao Tong University, Fudan University, Tongji University
- **Wuhan**: Wuhan University, Huazhong University of Science and Technology

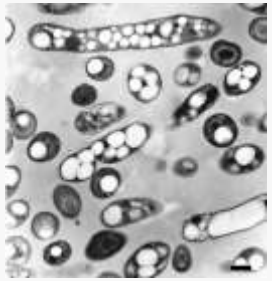
Good to know:
The ParisTech – CSC PhD program is opened to all Chinese students, and not only to Chinese students from ParisTech partner universities.

HISTORY


Arts et Métiers
1780
AgroParisTech
1824
ESPCI PARIS PSL
1882
INSTITUT d'OPTIQUE GRADUATE SCHOOL ParisTech
1917
1750
1800
1850
1900
1950
2000
MINES ParisTech | PSL
1783
École des Ponts ParisTech
1747
Chimie Paris ParisTech | PSL
1896

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

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PERMAMENT CONNECTIONS WITH COMPANIES

PARISTECH ALUMNI - SUCCESSFUL START-UPS

alan	Health insurance online raised 23 millions euros in 2018
TALENTSOFT	European leader in Cloud-based management and learning software
Bla Bla Car	Valued at USD$1.6 billion
DEEZER	100 million Euros raised
Ynsect	High quality natural ingredients for aquaculture and pet nutrition
DAMAE MEDICAL	Diagnosis for skin cancer
Expliseat	Ultra-light (4kg) Titanium Seats for Aircrafts
acute3D	Acquired by Bentley Technologies
ECAY	Daylighting System with Fiber Optic
SUPERSONIC imagine	Medical Imaging – Inventor of Aixplorer with the capacity of acquiring images 200 times faster than conventional ultrasound system

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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

You are a Chinese student in France

- Currently student in Master 2
- Holding a Master degree since less than 1 year
- *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.*

STUDYING IN ONE OF THE 32 PARTNER COUNTRIES OF THE CSC

WORKING

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

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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.*

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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

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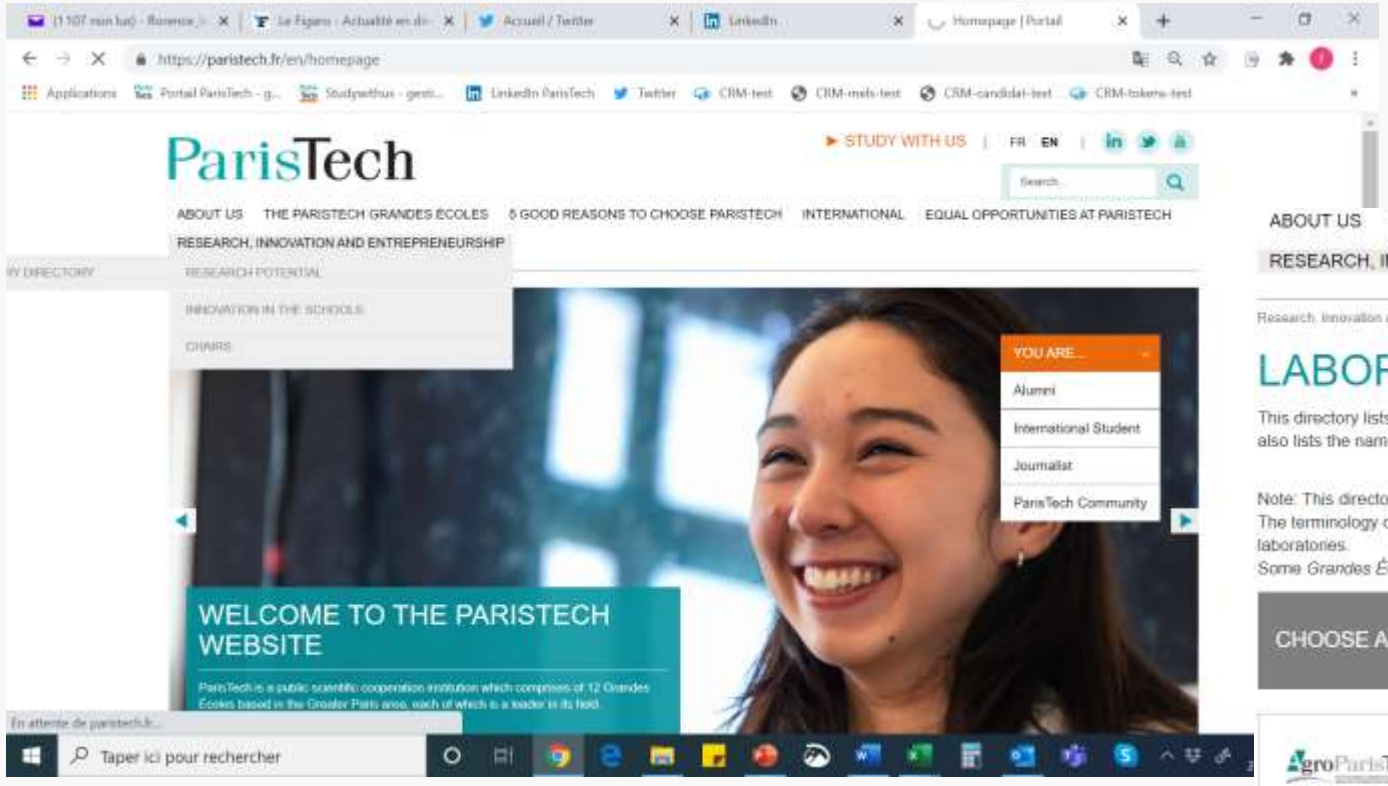
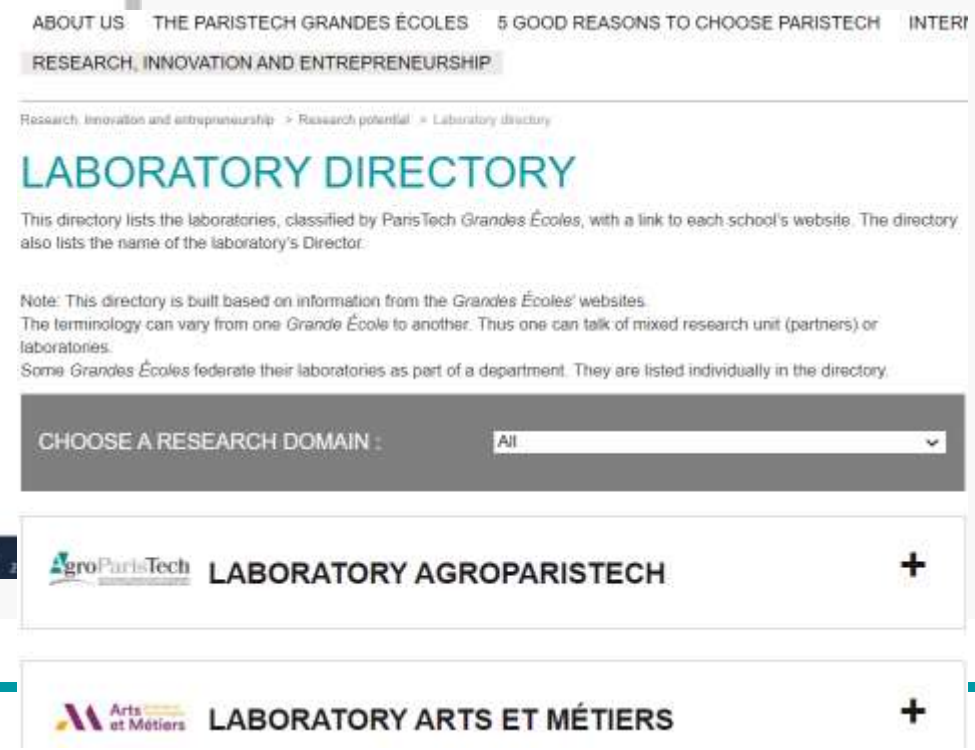
WHERE TO FIND RELEVANT INFORMATION?

PARISTECH WEBSITES

https://www.paristech.fr/en/homepage



To learn more about the ParisTech – CSC PhD program, about the ParisTech labs, etc.



2020-2021 CAMPAIGN

7 SCHOOLS

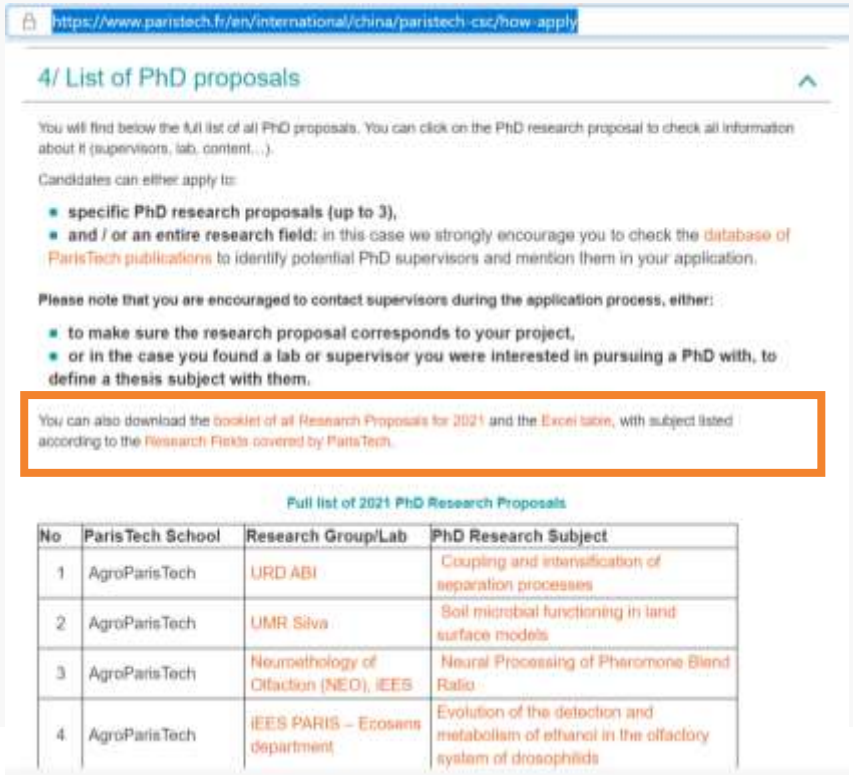
116 PHD PROPOSALS

in

12 FIELDS OF ENGINEERING

LABS LOCATED IN +20 CITIES IN FRANCE

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



WHERE TO GET RELEVANT INFORMATION?

PARISTECH SOCIAL MEDIA ACCOUNTS

For videos, information on research and innovation in ParisTech schools…

GLOBAL ACCOUNTS

LinkedIn

Twitter

YouTube

CHINESE ACCOUNTS

LinkedIn

Wechat

Twitter

Weibo

Bilibili

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INTERNATIONAL ADMISSION PROCESS

19 October 2020: Publication of the PhD research proposals

October 19, 2020 – December 13, 2020: Application

December 25, 2020: Invitation to the interview

January 6 – 22, 2021: Interview with ParisTech

Late January – February 2021: Interview with the PhD supervisor(s)

Admission letter

March 2021: CSC scholarship application

APPLICATION

Step 1- Publication of the PhD research proposals on ParisTech website on October 19, 2020

Step 2- Application : Send your application to china@paristech.fr from October 19, 2020 to December 13, 2020

LIST OF REQUIRED DOCUMENTS FOR APPLICATION	
Application form	2 completed and signed recommendation forms
Student ranking certificates	Academic transcripts (at bachelor and master level).
An English summary of your master thesis	A personal statement – motivation letter (1-2 pages)
A research plan (one page)	Any evidence of French or English proficiency
Any further document proving your academic or scientific achievement / excellence (ex. university prize, published work, previously awarded scholarship)	A scan of your passport or resident ID card

Step 4- Selection based on the application files and if selected, invitation to an interview (December 25, 2020)

Step 5- Online interviews from January 6 to 22, 2021

Step 6- Interview with the potential PhD supervisor(s) from end of January to end of February 2021

Step 7- Conditional admission letter provided to the selected applicants by the PhD supervisors (conditions: obtention of master degree and CSC scholarship) (early March 2021)

Step 8- Application for the CSC scholarship by the student (Mid-March to the end of March)

Step 9- Results of the CSC process (May-June 2021)

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

TUITION FEES

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	

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**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 2021 – June 2021, 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 2021.

STUDYING AT PARISTECH

INTERNATIONAL STUDENTS SERVICES

- 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

ParisTech

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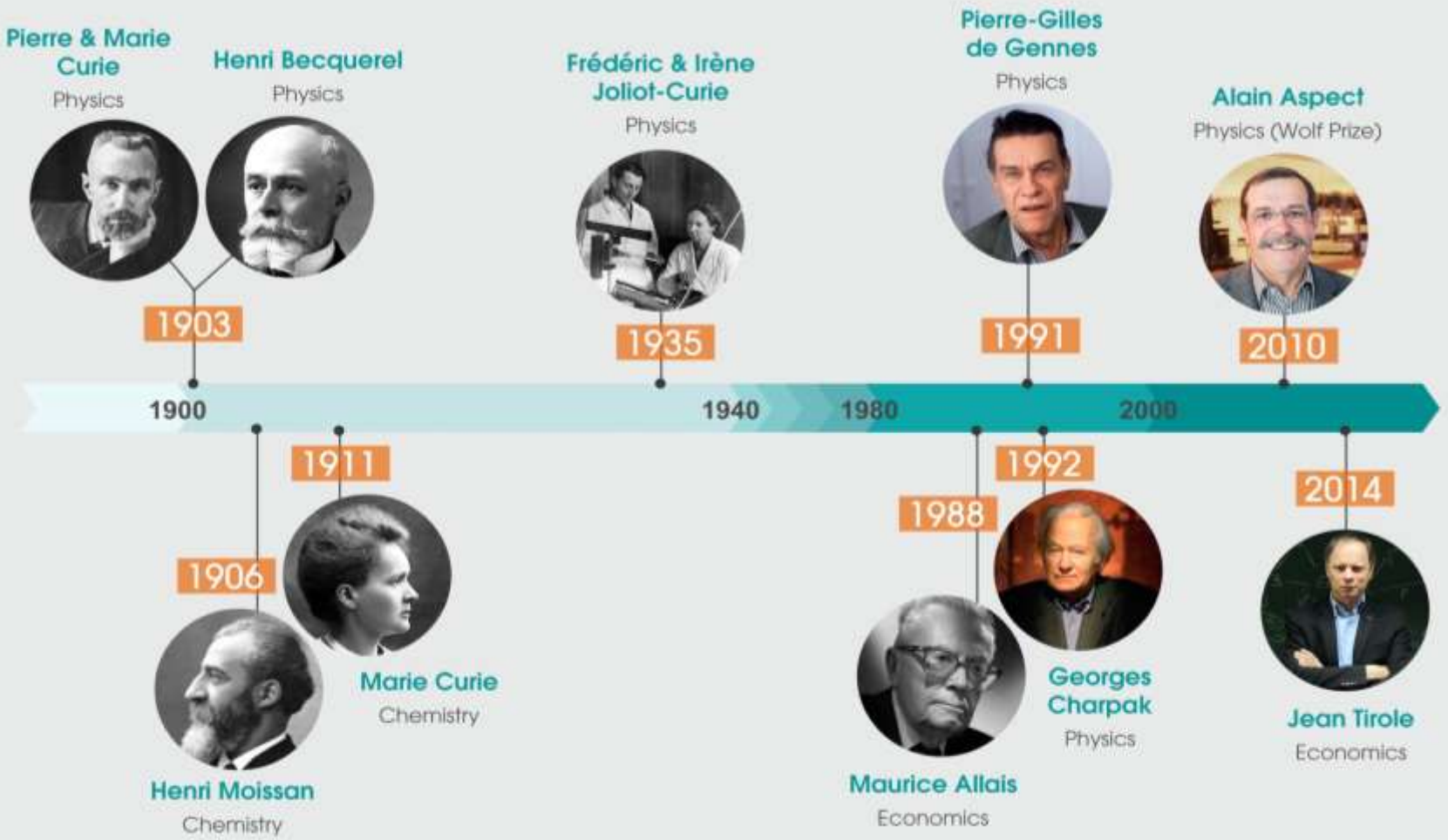
A LONG TRADITION OF SCIENTIFIC EXCELLENCE

NOBEL PRIZES



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RANKINGS

From 2020, in the international rankings

- *AgroParisTech and Institut d'Optique belong to* ***University Paris-Saclay (UPS)***
- *Chimie ParisTech, ESPCI Paris and MINES ParisTech belong to* ***University Paris Sciences et Lettres (PSL)***
- ***Ecole des Ponts ParisTech*** *(Ponts PT) and* ***Arts et Métiers Sciences and Technologies*** *(A&M) are ranked on their own*

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Shanghai Ranking (ARWU) 2020

University Paris Saclay: 14th **University PSL: 36th**

THE 2021

PSL: 46th
Ecole des Ponts ParisTech: 251-3000

QS 2021

PSL: 52th
Ecole des Ponts ParisTech: 242th
Université Paris-Saclay: 305th

Shanghai Ranking (ARWU) 2020 – by subject

Physics
#10 PSL

Mathematics
#301-400 Ecole des Ponts PT

Chemistry
#101-150 PSL

Earth sciences
#201-300 Ecole des Ponts PT
#51-75 Paris-Saclay

Atmospheric science
#76-100 Ecole des Ponts PT
#76-100 Paris-Saclay

Chemical Eng.
#201-300 PSL
#201-300 Paris-Saclay

Civil Eng.
#201-300 Ecole des Ponts PT

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

Ecology
#101-500 Paris-Saclay

Materials Sc. & Eng.
#101-150 PSL

Nanoscience & Nanotechnology
#101-150 PSL

Energy Sc & Eng
#201-300 PSL

Mechanical Eng.
#151-200 A&M S&T
51-75 PSL

Electrical and Electronic eng.
#401-500 A&M S&T

Water resources
#101-150 Paris-Saclay

Automation & Control
#151-200 A&M S&T

Metallurgical Eng.
#37 PSL
#76-100 A&M S&T

Medical Technology
#101-150 PSL

Food S&T
#51-75 Paris-Saclay

Biotechnology
#35 Paris-Saclay

Remote sensing
#76-100 Paris-Saclay

Economics
#51-75 PSL
#201-300 Ponts PT

Agricultural Sc.
#12 Paris-Saclay

Biological sciences
#76-100 Paris-Saclay

Human Biological Sciences
#76-100 Paris-Saclay

Veterinary Sciences
#76-100 Paris-Saclay

PARTNER NATIONAL RESEARCH INSTITUTES

IFSTTAR

ParisTech

INRAE

Inserm

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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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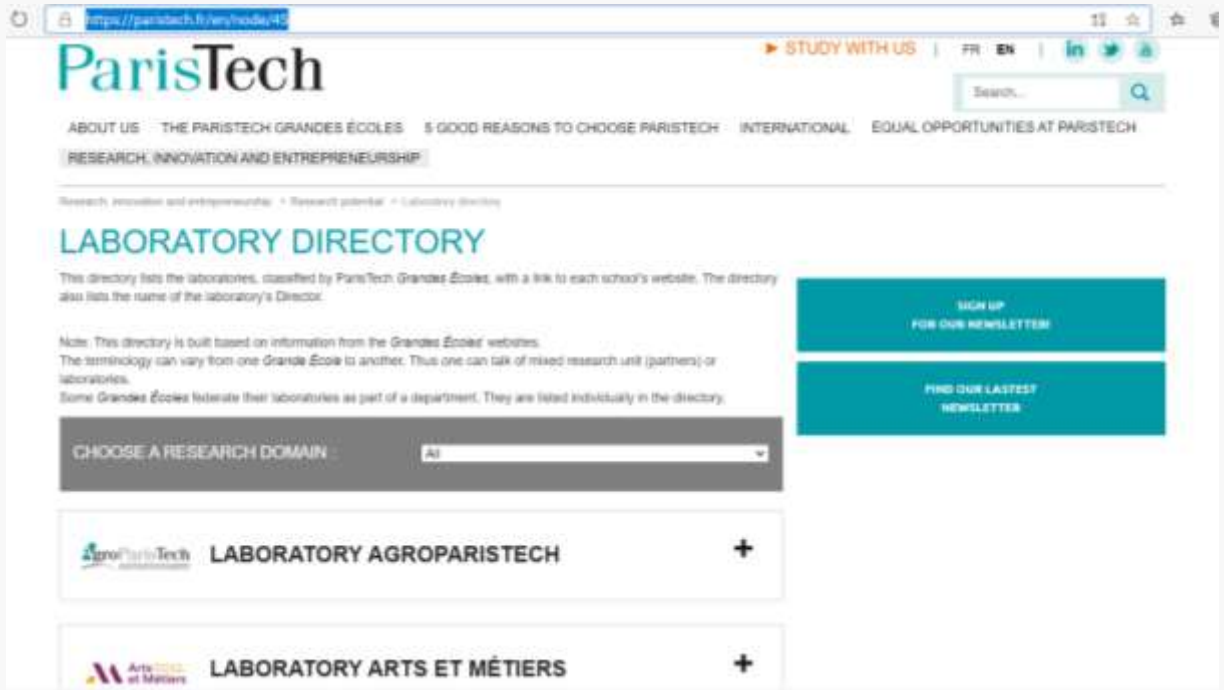
PARISTECH SCHOOLS' LABS

Learn more about the labs in each school:



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CHEMISTRY, PHYSICO-CHEMISTRY, MECHANICAL ENGINEERING

AgroParisTech

SayFood (Paris-Saclay Food and Bioproduct Engineering)

ÉcoSys

Chimie ParisTech - PSL

i-CLeHS

IRCP Institut de Recherche de Chimie Paris

ESPCI Paris - PSL

UMR 7083 Gulliver

CBI Chimie Biologie Innovation

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

leesu laboratoire eau environnement systèmes urbains *

* *Environmental chemistry*

DESIGN, INDUSTRIALIZATION

ARTS ET MÉTIERS

Laboratoire Conception Produits Innovation

LCFC

LAMPA
Laboratoire Angevin de Mécanique, Procédés et innovAtion

I2M BORDEAUX INSTITUT DE MÉCANIQUE ET D'INGÉNIERIE

Arts et Métiers Sciences et Technologies / lispen

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

LPEM

Chimie ParisTech - PSL

i-CLeHS

IRCP Institut de Recherche de Chimie Paris

IPVF

Arts et Métiers

L2EP Laboratoire d'électrotechnique et d'électronique de puissance de Lille

I2M Bordeaux Institut de Mécanique et d'Ingénierie

IRENAV

LIFSE Laboratoire Ingénierie des Fluides Systèmes Énergétiques

DynFluid Fluid Dynamics Laboratory

Laboratoire de Mécanique des Fluides de Lille Kampé de Fériet

MINES ParisTech - PSL

Centre efficacité énergétique des systèmes (CES)

CMA Centre de Mathématiques Appliquées

Centre of Thermodynamics of Processes (CTP)

CENTRE DE RECHERCHE SUR LES RISQUES ET LES CRISES

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)

TERRITOIRE ENVIRONNEMENT TELEDETECTION INFORMATION SPATIALE
tetis

URD
Agro Biotechnologies Industrielles
by AgroParisTech

Ecologie des Forêts de Guyane
Silva UMR

ESPCI PARIS – PSL

Physique et Mécanique des Milieux Hétérogènes
UMR 7636

ARTS ET MÉTIERS

LIFSE Laboratoire Ingénierie des Fluides Systèmes Énergétiques

I2M BORDEAUX INSTITUT DE MÉCANIQUE ET D'INGÉNIERIE

IRENAV

ECOLE DES PONTS PARISTECH

cerea

leesu
laboratoire eau environnement systèmes urbains

HM&C HYDROLOGY METEOROLOGY and COMPLEXITY

LMD

MINES PARISTECH - PSL

Centre de Géosciences (GEOSCIENCES)

MINES ParisTech | PSL | ISIGE

INFORMATION AND COMMUNICATION S&T

ARTS ET MÉTIERS

Arts et Métiers Sciences et Technologies / lispen

MINES PARISTECH – PSL

Centre for Mathematical Morphology (CMM)

Centre de recherche en informatique (CRI)

INSTITUT D'OPTIQUE

LP2N Laboratoire Photonique Numérique & Nanosciences

ECOLE DES PONTS PARISTECH

Gaspard Monge Laboratoire d'informatique

LIFE AND HEALTH S&T

AgroParisTech

SayFood (Paris-Saclay Food and Bioproduct Engineering)

umr BIOGER
Biologie et gestion des risques en agriculture

Laboratoire de Physiologie de la Nutrition et du Comportement Alimentaire

UMR MoSAR

Ecologie Systématique Evolution

Génétique Quantitative et Évolution Le Moulon

ijpb

MINES ParisTech – PSL

MINES ParisTech

CBIO – Centre for Computational Biology

Chimie ParisTech - PSL

i-CLeHS

Arts et Métiers

Laboratoire LIFSE
Ingénierie des Fluides Systèmes Énergétiques

ESPCI Paris – PSL

Institut Langevin
ONDES ET IMAGES

Plasticité du Cerveau

SMBP

Physics for Medicine PARIS
INVENT THE FUTURE OF MEDICAL TECHNOLOGIES

Ecole des Ponts ParisTech

leesu
laboratoire eau environnement systèmes urbains

*

* *Microbiology, Ecotoxicology*

LIFE SCIENCE AND ENGINEERING FOR AGRICULTURE, FOOD AND ENVIRONMENT

ECOLE DES PONTS PARISTECH

leesu laboratoire eau environnement systemes urbains *

* 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)

CIRED

ijpb

umr BIOGER Biologie et gestion des risques en agriculture

G-eau

MIA Paris

Ecologie des Forêts de Guyane

Micalis Microbiologie de l'Alimentation au service de la Santé

Laboratoire de Physiologie de la Nutrition et du Comportement Alimentaire

Ecologie Systématique Evolution

MATERIAL SCIENCES, MECHANICS AND FLUIDS

ARTS ET MÉTIERS

MSMP Mechanics, Surfaces and Materials Processing

AM² Transatlantic Partnership for Industry of the Future

iMM

DynFluid Fluid Dynamics Laboratory

LAMPA Laboratoire Angevin de Mécanique, Procédés et innovAtion

LaBoMaP

LEM3 Laboratoire d'Étude des Microstructures et de Mécanique des Matériaux

Institut de Biomécanique Humaine Georges Charpak

I2M Institut de Mécanique et d'Ingénierie Bordeaux

LIFSE Laboratoire Ingénierie des Fluides Systèmes Énergétiques

Laboratoire de Mécanique des Fluides de Lille Kampé de Fériet

ECOLE DES PONTS PARISTECH

Navier

LABORATORY FOR HYDRAULICS SAINT-VENANT

CHIMIE PARISTECH – PSL

IRCP Institut de Recherche de Chimie Paris

IPVF

MINES PARISTECH – PSL

Cemef CNRS UMR 7635

CENTRE DES MATERIAUX PIERRE-MARIE FOURT

ESPCI PARIS – PSL

UMR 7083 Griver

SIMM

Physique et Mécanique des Milieux Hétérogènes UMR 7636

Institute of Porous Materials (IMAP)

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MATHEMATICS AND APPLICATIONS

AgroParisTech

MIA Paris

MINES ParisTech – PSL

Centre Automatique et systèmes (CAS)

Centre for Mathematical Morphology (CMM)

CBIO – Centre for Computational Biology

ESPCI Paris – PSL

UMR 7083 Gulliver

ÉQUIPE DE STATISTIQUE APPLIQUÉE

Ecole des Ponts ParisTech

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

PHYSICS, OPTICS

ESPCI Paris – PSL

Institut Langevin
ONDES ET IMAGES

LPEM

UMR 7083
Gulliver

Physique et Mécanique
des Milieux Hétérogènes
UMR 7636

CBI
CHIMIE BIOLOGIE INNOVATION

Sciences et Ingénierie de la Matière Molle
SIMM

Institut d'Optique

LABORATOIRE CHARLES FABRY

LABORATOIRE HUBERT CURIEN
UMR • CNRS • 5516 • SAINT-ETIENNE

LP2N
Laboratoire Photonique
Numérique & Nanosciences

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URBAN PLANNING, TRANSPORT

ECOLE DES PONTS PARISTECH

CIRED

LVMT Laboratoire Ville Mobilité Transport

LATTS | LABORATOIRE TECHNIQUES TERRITOIRES ET SOCIÉTÉS

leesu
laboratoire eau environnement systèmes urbains

Research at AgroParisTech

Alexandre péry

ParisTech
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PARISTECH – CSC PHD PROGRAM

4 PhD proposals **4** Fields of research **3** Research units

RESEARCH UNITS / INSTITUTES

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

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 AT AGROPARISTECH

RESEARCH INFRASTRUCTURES

Experimental farm, Grignon

Experimental pilot plant, Massy

Name

Urban agriculture, Paris

Name

ParisTech
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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

Number of publications : 300 per year

15 patents

Prestigious partnerships with

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

INRA lifetime achievement award, PhD prizes etc.

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Research at Arts et métiers Institute of Technology

Fodil MERAGHNI

ParisTech
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PARISTECH – CSC PHD PROGRAM

54 PhD proposals **5** Fields of research **15** Research units

A SINGLE INSTITUTION WITH EIGHT CAMPUSES AND THREE INSTITUTES

Arts et Métiers campuses

Institutes

Arts et Métiers Institute of Technology

THE ARTS ET MÉTIERS GROUP
IN FIGURES

11
SITES across France specialising in education and research

220
PHD STUDENTS
in our "Engineering Sciences" doctoral school

1
BACHELOR'S DEGREE OF TECHNOLOGY

6000
STUDENTS
across all courses

15
LABORATORIES
and research teams

11
ENGINEERING PROGRAMMES
1 Grande École engineering programme
10 Apprenticeship engineering programmes

1100
PERSONNEL
lecturers, technicians & administrative staff

7
MILLION in revenue
LIFELONG SKILLS DEVELOPMENT

+20
National research master's programmes

15
million in revenue generated through contracts with industry

2000
AUDITORS
in lifelong skills development

17
MASTÈRES SPECIALISÉS © programmes

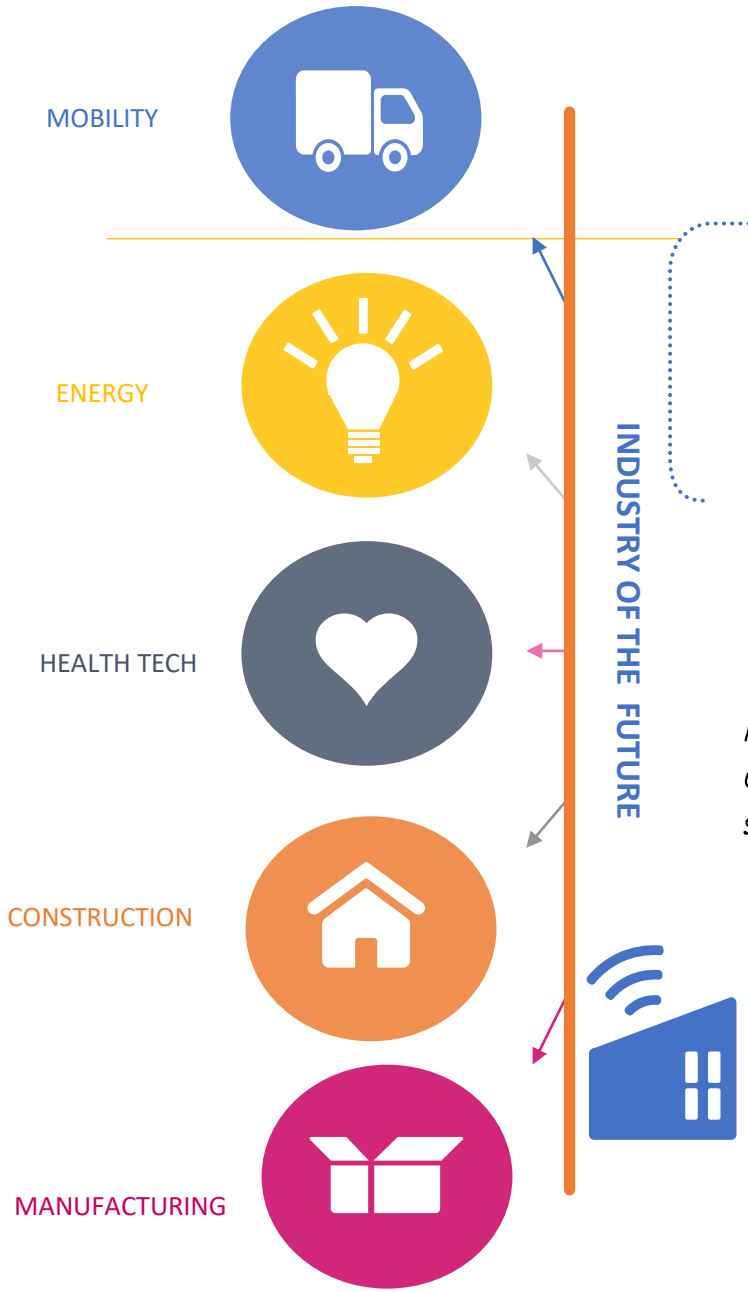
Arts et Métiers Institute of Technology

RESEARCH AND INNOVATION

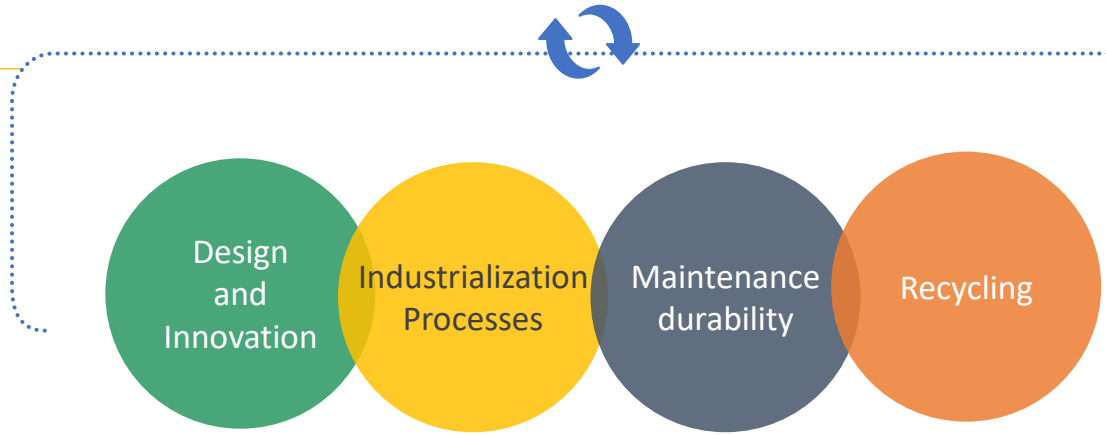
5 STRATEGIC FIELDS

INSTITUT CARNOT ARTS

Excellence Label for research transfer to industry



RESEARCH ON THE FULL LIFE CYCLE



Modelling and control of complex systems

Electrical & Energy engineering

Innovation Processes

Robotics

Design

Solid & Fluid Mecanics

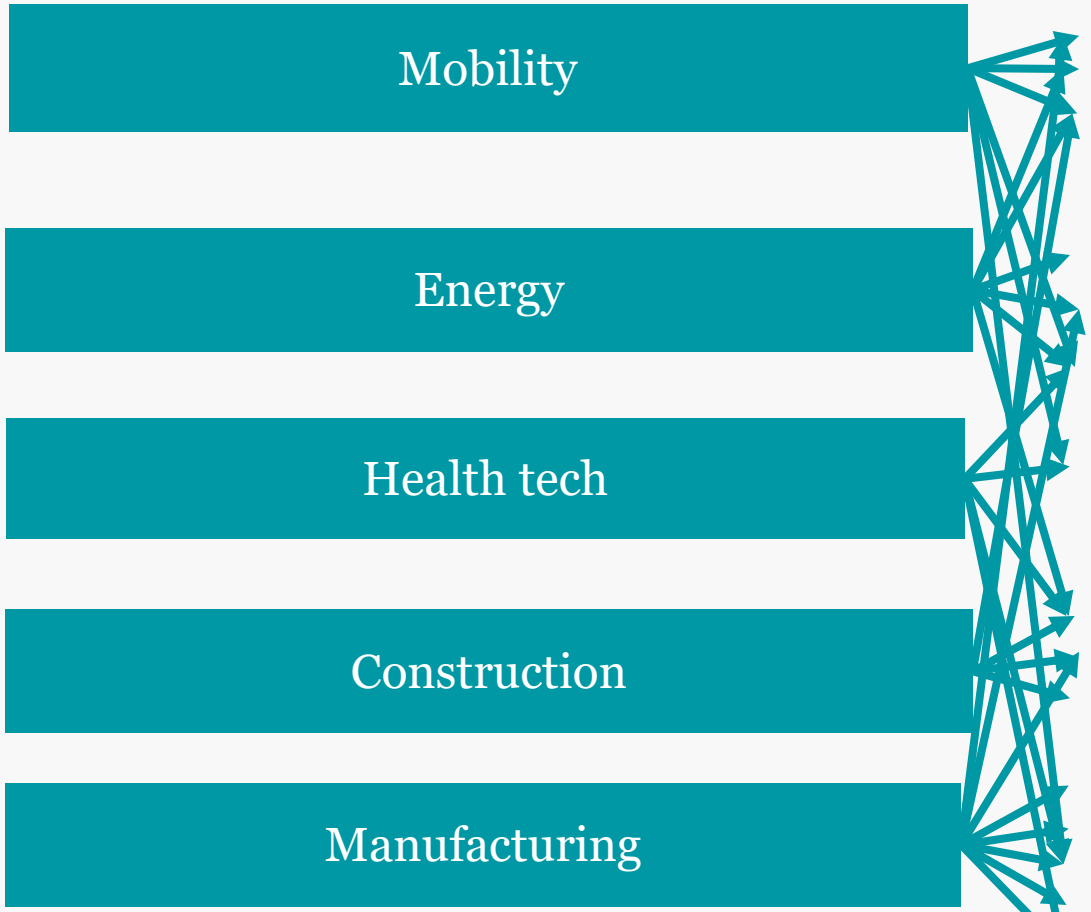
Material Science

Manufacturing

Multi-Physics

RESEARCH UNITS / INSTITUTES

Research domains at Arts et Métiers Sciences et Technologies:



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…

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

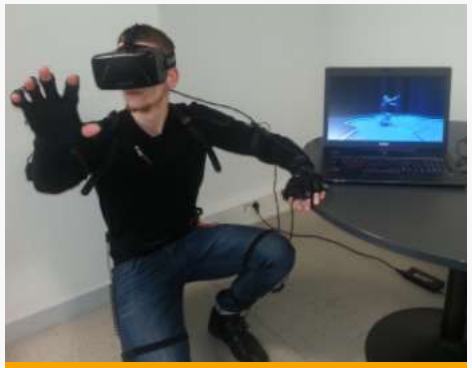
Institut de biomécanique humaine Georges Charpak (Paris) - neuro-musculoskeletal modeling, sport, disability

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

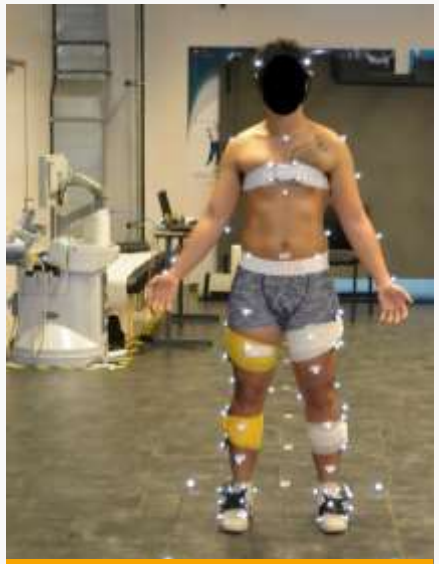
LCFC (Metz) – design, manufacturing, control
LCPI (Paris, Chambéry) – prototyping by virtual reality, creativity, usage analysis, eco-design
LISPEN (Lille, Chalon, Aix-en-Provence): system engineering, modeling, Human-Machine Interaction
MSMP (Lille, Chalon, Aix-en-Provence): mechanics, surfaces and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

RESEARCH AT ARTS ET MÉTIERS

KEY FACTS / FIGURES

228 teacher-researchers + 149 teachers
220 PhD candidates

532 publications in 2019 including
187 international co-publications

17 patents

6 Research Chairs

Prestigious partnerships and with:

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

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Arts et Metiers Partnerships in China

In 2018, Arts et Métiers and Beihang University celebrated 30 years of collaboration

IN BEIJING
Beihang University
Tsinghua University

IN SHANGHAI
Tongji University
Shanghai Jiao Tong University

IN NANJING
Nanjing University of Aeronautics and Astronautics
Southeast University

IN HARBIN
Harbin Institute of Technology

IN XI'AN
Xi'an Jiaotong University

IN CHONGQING
Chongqing University

Research at Chimie ParisTech - PSL

Ilaria Ciofini

ParisTech
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PARISTECH – CSC PHD PROGRAM

19 PhD proposals **3** Fields of research **3** Labs

RESEARCH AT CHIMIE PARISTECH – PSL

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 AT CHIMIE PARISTECH – PSL

RESEARCH INFRASTRUCTURES IN PARIS CITY CENTER

New Aglae (Louvre)

NMR/Mass/HPC facilities

Characterization (spectroscopy, microscopy)

Chemistry

Optics

ParisTech
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RESEARCH AT CHIMIE PARISTECH – PSL

KEY FACTS / FIGURES

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

300 publication a year

7 patents a year

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

and many others…

4 ERC (1 Starting, 2 Consolidator, 1 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

Auguste Gires

ParisTech
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PARISTECH – CSC PHD PROGRAM

École des Ponts ParisTech

6 PhD proposals

3 Fields of research

4 Research units

CERMICS École des Ponts ParisTech

HMCO HYDROLOGY METEOROLOGY and COMPLEXITY

LABORATOIRE D'HYDRAULIQUE SAINT-VENANT

leesu laboratoire eau environnement systemes urbains

RESEARCH UNITS / INSTITUTES

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

RESEARCH UNITS / INSTITUTES

RESEARCH INFRASTRUCTURES

Fresnel

Build'In

EDF'lab Chatou

X- band radar

Platform TARANIS

Blue-Green Wave

Multi-Hydro, RadX@HMo

ParisTech
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STAR RESEARCHERS AT ECOLE DES PONTS PARISTECH

Philippe JEHIEL (PjSE), ERC

2017 Fall Meeting Honors Tribute Show

Daniel SCHERTZER (HM&Co), EGU Lewis Fry Richardson medallist h-index 36 (WoS) or 50 – GoogleScholar

Céline GUIVARCH, member of IPCC

Pierre DELAGE (Navier), Member of the Academy of Agriculture

Damien VIOLEAU Arthur Thomas Ippen Award 2015

RESEARCH UNITS / INSTITUTES

KEY FACTS / FIGURES

461 researchers / teacher-researchers
486 PhD candidates including 48% of international PhD candidates
71 post-docs

812 international publications in 2019
Including 43% international co-publications

10M€ contracts with companies

50% of research sponsored by industry

... and much more

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

RESEARCH AT ESPCI PARIS - PSL

COSTANTINO CRETON

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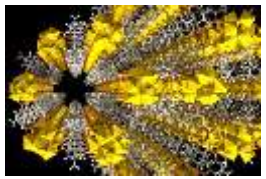
ParisTech – CSC PhD Program

ESPCI PARIS | PSL

20 PhD proposals **7** Fields of research **7** Research units

CBI Chimie Biologie Innovation

UMR 7083 Gulliver



Institut Langevin
ONDES ET IMAGES

Physique et Mécanique
des Milieux Hétérogènes
UMR 7636

SIMM

Find the video on ParisTech China Bilibili account!

RESEARCH UNITS / INSTITUTES

Research domains at ESPCI Paris – PSL:

Biology

- **Brain Plasticity Lab** – neurosciences
- **SBMP**– proteomics
- **Physics for Medicine** – wave physics for medicine

Chemistry

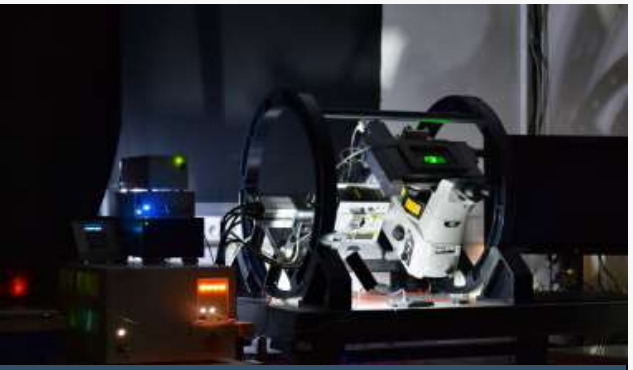
- **Chemistry of Molecules and Materials** – chemistry of molecules and materials
- **Soft Matter Science and Engineering, Institute of Porous Materials (IPM)** – soft matter, materials science & complex fluids
- **CBI** – microfluidics for physical chemistry and pharmaceutics

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

RESEARCH UNITS / INSTITUTES

RESEARCH INFRASTRUCTURES



Confocal Microscopy

3D Printing

Microfluidic

SOME KEY RESEARCHERS ESPCI PARIS - PSL

MATHIAS FINK
ULTRASOUNDS (ERC)

MICKAEL TANTER
IMAGERY FOR MEDICINE (ERC)

CHRISTIAN SERRE
METAL ORGANIC FRAMEWORKS

ANKE LINDNER
COMPLEX FLUIDS (ERC)

ANDREW GRIFFITHS
MICROFLUIDICS FOR PHARMA (ERC)

TERESA LOPEZ-LEON
CNRS BRONZE MEDAL

Name

Name

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RESEARCH UNITS / INSTITUTES

KEY FACTS / FIGURES

522 researchers / teacher-researchers
267 PhD candidates

Prestigious partnerships with academic laboratories and companies

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

30 patents per year
3 startups created each year

6 Nobel Prizes, 15 ERC grants, CNRS Bronze Medal, UNESCO-L'Oréal For Women in Science awardees Young Researchers

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Research at Institut d'Optique Graduate School

Pierre BALADI

ParisTech
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PARISTECH – CSC PHD PROGRAM

5 PhD proposals **1** Fields of research **2** Research units

RESEARCH UNITS / INSTITUTES

Research domains at Institut d'Optique Graduate School:

Laboratoire Charles Fabry (LCF)

Joint research unit between Institut d'Optique Graduate School and the CNRS, in partnership with Paris-Saclay University. The lab research covers a broad spectrum of topics in optics and photonics and their applications.

- Biophotonics group
- Quantum Gases group
- Imaging and Information group
- Laser group
- Nanophotonics group
- Quantum Optics
- XUV optics group
- Nonlinear photonics

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. Its research focuses on complex systems integrating optics and computing.

- Bordeaux Nanophotonics Group
- Light in Complex Nanostructures group
- "Cold Atoms in Bordeaux" (CAB) group
- BioImaging & OptoFluidics group
- Nano-BioMicroscopy team (NabLab)
- Computer graphics and Optics group
- Computational Imaging and Display
- Sytèmes photoniques

Laboratoire Hubert Curien(LHC)

The Hubert Curien laboratory is a joint research unit (UMR 5516) of the Jean Monnet University, Saint-Etienne, the National Research Centre "CNRS" and the Institut d'Optique Graduate School. Our research activities are organized according to two scientific departments: ***Optics, photonics and surface*** *and* ***Computer Science, Security, Image****.*

- Micro & Nano structuring (head: Yves Jourlin)
- Laser-matter interaction (head: Razvan Stoïan)
- Image science & computer vision (head: Thierry Fournel)
- Data intelligence (head: Amaury Habrard)
- Connected intelligence (head: Olivier Boissier)
- Secure Embedded Systems & Hardware Architectures (head: Lilian Bossuet)

RESEARCH UNITS / INSTITUTES

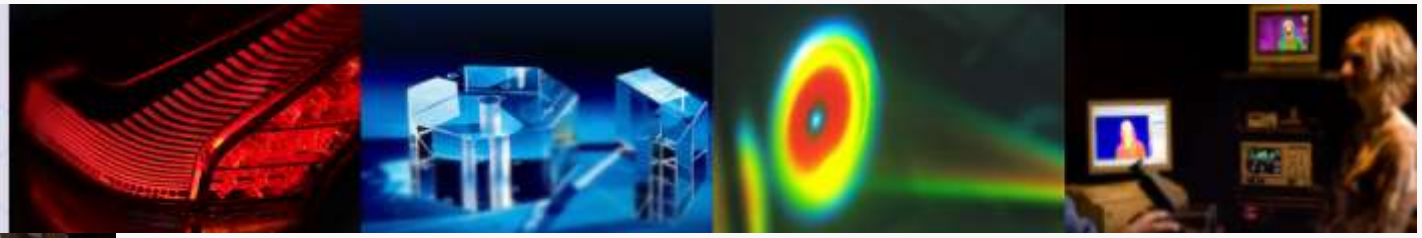
RESEARCHERS AT INSTITUT D'OPTIQUE GRADUATE SCHOOL

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

PHILIPPE GRANGIER
Winner of the SFO Léon Brillouin Grand Prix (2013)
Jean-Ricard Prize from the French Physics Society (2008)
Lazare Carnot Prize from the French Academy of Sciences (2005)
CNRS Silver medal (2002)

JEAN-JACQUES GREFFET
OSA fellow
Recipient of the Servant prize of the French Academy of Science

KEVIN VYNCK
CNRS Bronze medal (2019)



RESEARCH UNITS / INSTITUTES

KEY FACTS / FIGURES

66 teaching researchers & researching, 30 researchers
89 PhD candidates

1 scientific paper & 2 communications / day
IOGS researchers cited 30 times /day

Prestigious partnerships

Laval University, Sherbrooke University, Durham, NIST, UC Berkeley, Princeton University, Max Planck Institutes of Garching and Erlangen, the universities of Hanover, Innsbruck, Delft, Joensuu, Modena, Southampton, Durham, Peking University, Nankai University in Tianjin.

5 ERC, international gold medal Niels Bohr of the Danish Academy of Engineers and the UNESCO Niels Bohr medal, Balzan Prize and the Ives Medal distinction/Jarus Quinn Prize from the Optical Society of America, Tommassoni Award from the University of Rome for Alain Aspect, Léon Brillouin Award from the Société Française d'Optique (SFO) for Philippe Grangier, Servant Award from the French Academy of Sciences for Jean-Jacques Greffet, European Frequency and Time Forum Award for Giorgio Santarelli.

RESEARCH AT MINES PARISTECH - PSL

TATIANA BUDTOVA

ParisTech
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PARISTECH – CSC PHD PROGRAM

7 PhD proposals **4** Fields of research **4** Research units

Centre de recherche en informatique

Mathématiques et systèmes

- **Founded in 1783**
- 240 professors, ~1000 students, ~ 400 PhD candidates
- **5 sites**: Paris, Evry, Fontainebleau, Palaiseau and Sophia Antipolis
- **18 research centres 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 UNITS / INSTITUTES

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)

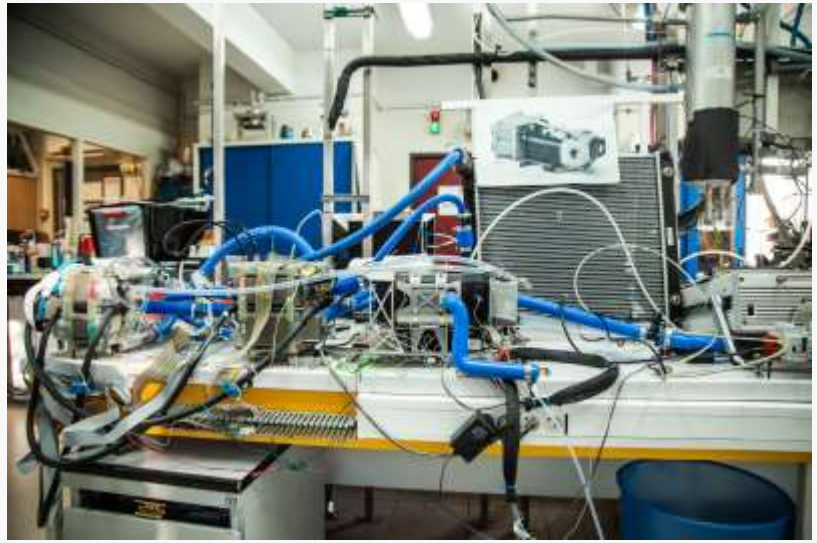
Earth sciences and environment
- Centre for Geosciences (GEOSCIENCES)
- Higher Institute for Environmental Engineering and Management (ISIGE)

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)

RESEARCH UNITS / INSTITUTES



RESEARCHER AT MINES PARISTECH – PSL
RECENT AWARD / GRANT RECIPIENTS

TATIANA BUDTOVA
CNRS SILVER MEDAL 2020

ZAKI LEGHTAS
ERC STARTING GRANT 2019

Name

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RESEARCH UNITS / INSTITUTES

KEY FACTS / FIGURES

100 PhDs awarded annually (25 % of women, 30 % of foreigners (48 nationalities), 50 % engineers)
232 teaching researchers (15% recruited abroad)

400 scientific publications rank A / year

311 patents & softwares in 2019

2 Nobel prizes
Maurice ALLAIS - Economics - 1988
Georges CHARPAK – Physics – 1992
2 ERC

Prestigious partnerships with academic laboratories, companies:

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

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

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Contacts

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PARISTECH OFFICE IN CHINA

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6. Labs and PhD proposals

PHD PROPOSALS - AGROPARISTECH

No	ParisTech Research field	Subfield	Title	Advisor(s) Name	Advisor(s) Email	Research/Lab group
1	Energy, Processes	Process engineering	Coupling and intensification of separation processes	Irina IOANNOU	irina.ioannou@agroparistech.fr	URD ABI
2	Environment Science and Technology, Sustainable Development, Geosciences	Biogeochemistry	Soil microbial functioning in land surface models	Matthias Cuntz, Delphine Derrien	matthias.cuntz@inrae.fr; delphine.derrien@inrae.fr	UMR Silva
3	Life Science and Engineering for Agriculture, Food and the Environment	Sensory Ecology	Neural Processing of Pheromone Blend Ratio	Abhishek CHATTERJEE, Philippe LUCAS	abhishekchttrj@gmail.com; philippe.lucas@inrae.fr	Neuroethology of Olfaction (NEO), iEES
4	Biology, Biophysics and Bio Chemistry	Ecology – neurophysiology - evolution	Evolution of the detection and metabolism of ethanol in the olfactory system of drosophilids	MAÏBECHE Martine / CHERTEMPS Thomas	martine.maibeche@sorbonne-universite.fr	iEES PARIS – Ecosens department

PARISTECH – CSC PHD PROGRAM

ParisTech
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AgroParisTech

INSTITUTE OF ECOLOGY AND ENVIRONMENTAL SCIENCES OF PARIS

SENSORY ECOLOGY DEPARTMENT

ParisTech
#Connect #Innovate #Share

Two teams working on insect chemical ecology, from mechanisms of chemosignal detection and integration to behaviors, with perspectives in neurobiology and biocontrol of insect pests

TEAM CHEMORECEPTION AND ADAPTATION

Olfactory and Gustatory Receptors

Genomic, evolution, adaptation

Group leader

Emmanuelle JACQUIN-JOLY

Camille MESLIN

Nicolas MONTAGNE

Enzymes in olfaction and detoxication

Esterase, Cyt P450…

Group leader

Martine MAIBECHE

Thomas CHERTEMPS

Impact of pollutants and temperature

Heavy metals, insecticides, endocrine disruptors…

Group leader

David SIAUSSAT

Manuel MASSOT

ParisTech
#Connect #Innovate #Share

Two teams working on insect chemical ecology, from mechanisms of chemosignal detection and integration to behaviors, with perspectives in neurobiology and biocontrol of insect pests

TEAM NEUROETHOLOGY OF OLFACTION

Olfactory transduction and coding

Neural coding, central processing, sensors

Group leader

Philippe LUCAS

Associated researchers

Abhishek CHATTERJEE

Neuroethology and cognitive ecology

Perception, orientation, learning

Group leader

Michel RENOU

Associated researchers

Matthieu DACHER

Sensory plasticity, sexual maturation

Endocrine regulation, hormone signaling

Group leader

Stéphane DEBERNARD

Associated researchers

Line DUPORTETS

ParisTech
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RESEARCH INFRASTRUCTURES ON TWO SITES IN PARIS AREA

INRAE (Versailles)

Campus Pierre et Marie Curie (Paris)

Electrophysiology

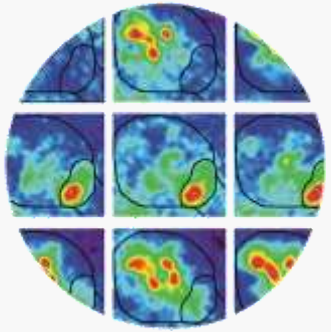
Physico-chemistry

Omics

Robotics

Behavior

Imaging



Name

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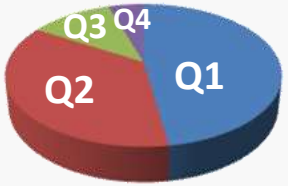
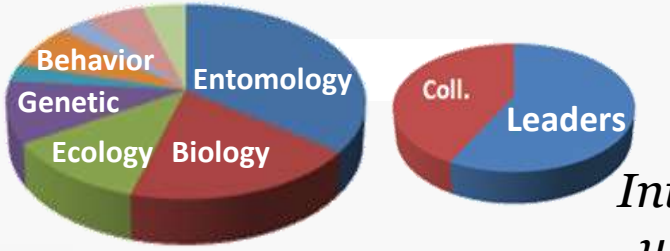
INSTITUTE OF ECOLOGY AND ENVIRONMENTAL SCIENCES OF PARIS
SENSORY ECOLOGY DEPARTMENT

KEY FACTS

6 researchers / 7 teacher-researchers
2 PhDs
3 Post-docs

>20 publications/year
in international peer-reviewed journals
>60% with international partners





nature COMMUNICATIONS

PNAS

eLIFE

Science Robotics

[redacted]

4 patents in plant protection
1 patent in bio-inspired robotics

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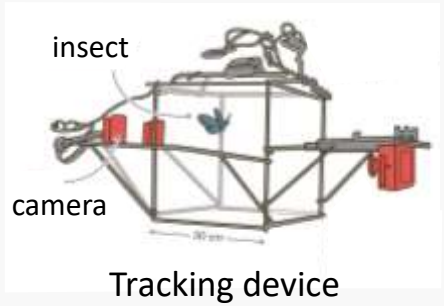
Prestigious partnerships

long term collaboration with Sweden

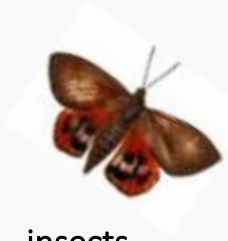
International lab with IPP-CAAS

E. Jacquin-Joly
Guest Professor at IPP-CAAS

4 research axes



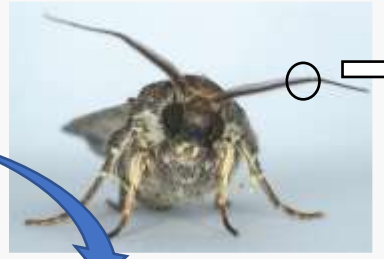
Tracking device

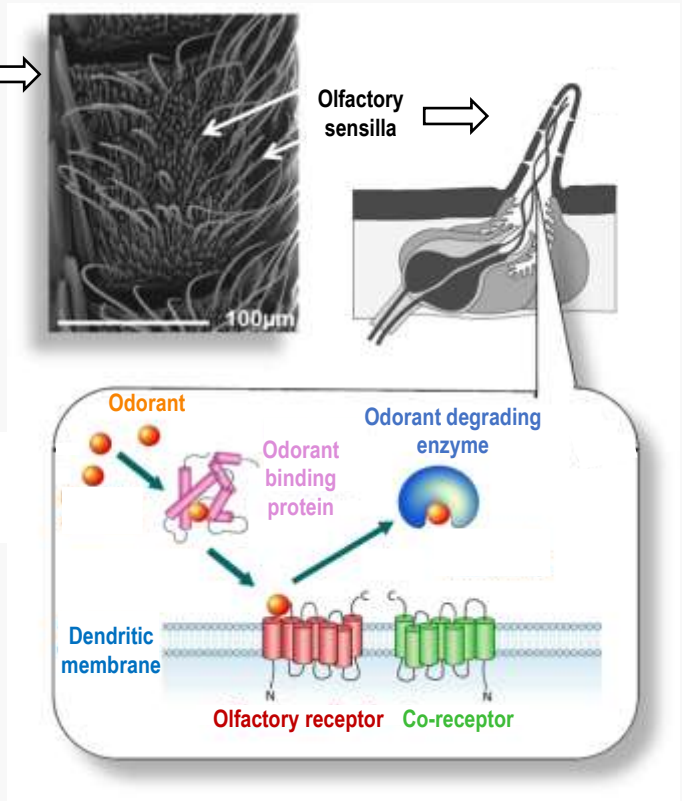


insects

plants

Axis 1
CHEMICAL SIGNALS





Axis 2
MECHANISMS

Axis 3
PLASTICITY
ADAPTATION / EVOLUTION

Axis 4
BIOCONTROL SOLUTIONS
ROBOTICS, SENSORS

Behaviors

Specialization, host plant…

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PHD PROPOSALS – ARTS ET MÉTIERS 1/5

No	ParisTech Research field	Subfield	Title	Advisor(s) Name	Advisor(s) Email	Research/Lab group
5	Materials Science, Mechanics, Fluids	Mechanical Engineering	Large strain characterization and modeling for sheet metal forming	Tudor Balan	tudor.balan@ensam.eu	LCFC – Laboratoire Conception Fabrication Commande
6	Materials Science, Mechanics, Fluids	Mech. Engineering / Automatic control	Trajectory shaping for vibration reduction of a class of non-linear non-minimum phase systems	Olivier Thomas, Richard Béarée	olivier.thomas@ensam.eu; richard.bearee@ensam.eu	LISPEN
7	Materials Science, Mechanics, Fluids	Mechanical/Material/Process Engineering	Improving formability of lightweight metallic materials using process chaining: Incremental Forming and Friction Stir Welding	Philippe DAL SANTO, Tudor BALAN, Sandra CHEVRET, Idriss TIBA	Philippe.dalsanto@ensam.eu; tudor.balan@ensam; sandra.chevret@ensam.eu; idriss.tiba@ensam.eu	LCFC / LAMPA
8	Materials Science, Mechanics, Fluids	Materials Science and Manufacturing	Effect of process parameters on the functional capability of High Temperature Shape Memory Alloys fabricated by laser additive manufacturing	Mohamed El Mansori, Nan Kang, Mourad El Hadrouz	mohamed.elmansori@ensam.eu; nan.kang@nwpu.edu.cn; mourad.elhadrouz@ensam.eu	MSMP - Mechanics Surfaces and Materials Processing
9	Materials Science, Mechanics, Fluids	Materials Science and Manufacturing	4D printing of net-shape part made of Ni-Ti shape memory alloys fabricated by laser additive manufacturing	Mohamed El Mansori, Nan Kang, Mourad El Hadrouz	mohamed.elmansori@ensam.eu; nan.kang@nwpu.edu.cn; mourad.elhadrouz@ensam.eu	MSMP - Mechanics Surfaces and Materials Processing
10	Materials Science, Mechanics, Fluids	Mechanical engineering	Toward a multiscale finite element modeling of the machining behavior of biocomposites	Mohamed EL MANSORI, Faissal CHEGDANI, Mourad EL HADROUZ	mohamed.elmansori@ensam.eu ; faissal.chegdani@ensam.eu ; mourad.elhadrouz@ensam.eu	Mechanics, Surfaces, and Materials Processing (MSMP – EA7350)
11	Materials Science, Mechanics, Fluids	Mechanical engineering	Multiscale machinability analysis of biocomposites under the laser cutting process	Mohamed EL MANSORI, Faissal CHEGDANI	mohamed.elmansori@ensam.eu ; faissal.chegdani@ensam.eu	Mechanics, Surfaces, and Materials Processing (MSMP – EA7350)
12	Materials Science, Mechanics, Fluids	Mechanics of Materials, Phase Field Fracture, Shape Memory Alloys	Phase field fracture modelling of shape memory alloy actuators for aerospace applications	Fodil MERAGHNI, Francis PRAUD, Boris PIOTROWSKI	fodil.meraghni@ensam.eu; francis.praud@ensam.eu; boris.piotrowski@ensam.eu	SMART research group / LEM3 UMR CNRS 7239
13	Energy, Processes	Thermodynamics, fluid mechanics, heat transfer	Life cycle assessment of hydrogen production and utilization in industry and mobility	Michael DELIGANT and Christelle PERILHON	michael.deligant@ensam.eu; christelle.perilhon@lecnam.net	Lifse
14	Energy, Processes	Thermodynamics, fluid mechanics, heat transfer	Heat transfer intensification for next generation thermal energy systems	Michael DELIGANT and Mathieu SPECKLIN	michael.deligant@ensam.eu; mathieu.specklin@lecnam.net	Lifse
15	Materials Science, Mechanics, Fluids		Modeling of metal nanoparticles embedded in viscoelastic media using fluid-structure interaction approach	Adil El Baroudi, Jean-Yves Le Pommellec, Amine Ammar	adil.elbaroudi@ensam.eu; jeanyves.lepommellec@ensam.eu; amine.ammar@ensam.eu	LAMPA

PHD PROPOSALS – ARTS ET MÉTIERS 2/5

No	ParisTech Research field	Subfield	Title	Advisor(s) Name	Advisor(s) Email	Research/Lab group
16	Design, Industrialization | Information and Communication Sciences and Technologies | Mathematics and their applications		Deep learning and multimodal declarative modeling for fast sketching of draft CAD models in the creative design phases	Jean-Philippe PERNOT, Arnaud POLETTE, Romain PINQUIE	jean-philippe.pernot@ensam.eu; arnaud.polette@ensam.eu; romain.pinquie@grenoble-inp.fr	Laboratory LISPEN
17	Materials Science, Mechanics, Fluids	Mechanical engineering, Computational mechanics, Mechanics of Materials	Experimental and numerical investigation of non-local damage in polymer based composites accounting for hygro-thermo-mechanical couplings	Fodil Meraghni, George Chatzigeorgiou, Adil Benaarbia	fodil.meraghni@ensam.eu; adil.benaarbia@ensam.eu; georges.chatzigeorgiou@ensam.eu	SMART Research group / LEM3 UMR CNRS 7239
18	Energy, Processes	Electrical Engineering	Model Order Reduction for Uncertainty Quantification in Computational Electromagnetics	Stéphane Clénet	stephane.clenet@ensam.eu	L2EP
19	Energy, Processes	Electrical Engineering	Sensorless Control for Integrated Multiphase Drives applied to Transportation Systems Using Artificial Intelligence Potentiality	Eric Semail, Ngac Ky Nguyen	eric.semail@ensam.eu; ngacky.nguyen@ensam.eu	Laboratory of Electrical Engineering and Power Electronics (L2EP)
20	Materials Science, Mechanics, Fluids	Materials Science & Engineering	Improvement of surface properties by PVD-Thermochemistry hybrid treatment on metal substrates obtained by conventional manufacturing processes and by powder metallurgy	NOUVEAU Corinne	corinne.nouveau@ensam.eu	Materials and Surface Engineering Team / Laboratoire Bourguignon des Matériaux et Procédés (LaBoMaP)
21	Energy, Processes	Materials Science and Mechanical Engineering	Multiscale stress/strain analysis of polycrystalline silicon for photovoltaic applications	Laurent BARRALLIER	laurent.barrallier@ensam.eu	MMS Team - MSMP Lab
22	Materials Science, Mechanics, Fluids	Mechanical Engineering	Study of the performance of recycled CO2 as cryogenic assistance in machining process: experimentation and numerical simulation	Hélène. BIREMBAUX, Gérard POULACHON, Frédéric ROSSI	helene.birembaux@ensam.eu; gerard.poulachon@ensam.eu; frederic.rossi@ensam.eu	LaBoMaP, UBFC
23	Information and Communication Sciences and Technologies	Design Engineering / 3D Modeling	Geometric simplification of digital CAD mock-up using substitution and envelope generation techniques exploiting explicit and implicit semantic information	Philippe VERON	Philippe.veron@ensam.eu	Carnot ARTS institute / LISPEN Laboratory
24	Materials Science, Mechanics, Fluids	Mechanical Engineering	Reconstruction of heterogeneous surface residual-stresses in polycrystalline materials from X ray diffraction measurements	Chedly Braham, Léo Morin	chedly.braham@ensam.eu; leo.morin@ensam.eu	PIMM laboratory (Comet Group)
25	Materials Science, Mechanics, Fluids	Materials science and mechanics	Experimental and numerical development of a High-Entropy High-Temperature Shape Memory Alloy (HE-HTSMA)	Fodil MERAGHNI, Sophie BERVEILLER	fodil.meraghni@ensam.eu; sophie.berveiller@ensam.eu	SMART/LEM3

PHD PROPOSALS – ARTS ET MÉTIERS 3/5

No	ParisTech Research field	Subfield	Title	Advisor(s) Name	Advisor(s) Email	Research/Lab group
26	Information and Communication Sciences and Technologies	Industrial Engineering	Towards the definition of I4.0 KPIs	Ali SIADAT, Virginie GOEPP, Nathalie KLEMENT	ali.siadat@ensam.eu; virginie.goepp@insa-strasbourg.fr; Nathalie.klement@ensam.eu	LCFC, ICube, LISPEN
27	Energy, Processes	Fluid mechanics, Aeroacoustics, Turbomachinery	Study of the aeroacoustic behavior of counter rotating subsonic axial flow fans	S. Kouidri, F. Ravelet, S. Khelladi	Smaine.kouidri@ensam.eu; florent.ravelet@ensam.eu; Sofiane.khelladi@ensam.eu	LIFSE
28	Materials Science, Mechanics, Fluids	Non-destructive analysis, residual stresses, fatigue damage, X-ray	Development of non-destructive characterization method using X ray diffraction line profile analysis and synthetic materials	Lorène Héraud	Lorene.heraud@ensam.eu	MMS/MSMP
29	Materials Science, Mechanics, Fluids	Mechanical Engineering	Very-high-cycle fatigue strength of metals under multiaxial stress state	PALIN-LUC Thierry, HONG Youshi, QIAN Guian	thierry.palin-luc@ensam.eu; hongys@imech.ac.cn; qianguian@imech.ac.cn	Institute of Mechanics and Mechanical Engineering (I2M), UMR CNRS 5295 and Institute of mechanics, Chinese academy of sciences (China)
30	Materials Science, Mechanics, Fluids | Life and Health Science and Technology	Fluid mechanics, Biomechanics, Biofluidics	Modeling the control parameters of pulsed flow through a Drug elucting stent	Smaine Kouidri, Mathieu Specklin	Smaine.kouidri@ensam.eu; Mathieu.specklin@ensam.eu	LIFSE
31	Materials Science, Mechanics, Fluids	Mechanical Engineering / Energy Engineering	Numerical Simulation of Droplet Impingement for Chip Cooling Process	Antoine Dazin, Francesco Romanò	antoine.dazin@ensam.eu; francesco.romano@ensam.eu	Laboratoire de Mécanique des Fluides de Lille (LMFL)
32	Materials Science, Mechanics, Fluids	Applied Mechanics	Influence of rheological and frictional slip properties on fault mechanics and localization phenomena	Saber EL AREM, Amine Ammar	saber.elarem@ensam.eu; amine.ammar@ensam.eu	LAMPA
33	Materials Science, Mechanics, Fluids	Mechanics of Materials	Phase field modeling of damage and fracture in polycrystalline materials under thermomechanical loading	Saber EL AREM, Amine Ammar	saber.elarem@ensam.eu; amine.ammar@ensam.eu	LAMPA
34	Materials Science, Mechanics, Fluids	Applied Mechanics	A systematic approach for cracked rotating shaft analysis	Saber EL AREM, Amine Ammar	saber.elarem@ensam.eu; amine.ammar@ensam.eu	LAMPA
35	Materials Science, Mechanics, Fluids	Mechanical Engineering	Optimizing flow control actuators by data-driven reduced-order models	Francesco Romanò, Joseph Pierric, Antoine Dazin	francesco.romano@ensam.eu; pierric.joseph@ensam.eu; antoine.dazin@ensam.eu	Laboratoire de Mécanique des Fluides de Lille (LMFL)
36	Design, Industrialization	Industrial Engineering	Ergonomic and Cognitive Decision Support System to manage daily a Reconfigurable Manufacturing System with Collaborative Robotics	Ali Siadat, Richard Béarée, Nathalie Klement	ali.siadat@ensam.eu; Richard.bearee@ensam.eu; Nathalie.klement@ensam.eu	LCFC, LISPEN

PHD PROPOSALS – ARTS ET MÉTIERS 4/5

No	ParisTech Research field	Subfield	Title	Advisor(s) Name	Advisor(s) Email	Research/Lab group
37	Materials Science, Mechanics, Fluids	Mechanical Engineering / Biomedical Engineering	Numerical and Experimental Study of Liquid Plugs in Human Lungs	Francesco Romanò, Amir Bahrani, Michaël Baudoin	antoine.dazin@ensam.eu; francesco.romano@ensam.eu	Laboratoire de Mécanique des Fluides de Lille (LMFL)
38	Materials Science, Mechanics, Fluids	Mechanical Engineering	Numerical modeling of solidification and high-pressure die casting process	Giovanni RADILLA	giovanni.radilla@ensam.eu; youssef.souhar@ensam.eu	MSMP (EA7350), IJL (UMR7198), Access RWTH Aachen
39	Energy, Processes	Energetics, Optimization, Life cycle, Microgrids, Multi-energy	Impact of the life cycle of multi-energy micro-grid systems on their energy efficiency	Pierre GARAMBOIS, Dr. Lionel ROUCOULES	pierre.garambois@ensam.eu, lionel.roucoules@ensam.eu	LISPEN
40	Design, Industrialization	Industrial Engineering	Reconfigurable Process Control for Reconfigurable Production/Manufacturing Systems	Ali SIADAT, Jean-Yves DANTAN, Lazhar HOMRI	ali.siadat@ensam.eu; jean-yves.dantan@ensam.eu; lazhar.homri@ensam.eu	LCFC
41	Design, Industrialization	Mechanical Engineering	Supervised learning for tolerance allocation	Jean-Yves DANTAN, Lazhar HOMRI	jean-yves.dantan@ensam.eu	LCFC
42	Energy, Processes	Electrical Engineering	Dynamic simulation of large transmission grid incorporating modular Multilevel converters with internal storage system	Kestelyn Xavier, François Gruson	xavier.kestelyn@ensam.eu; francois.gruson@ensam.eu	Laboratory of Electrical Engineering and Power electronics (L2EP)
43	Design, Industrialization	Industrial Engineering	Risk management of engineering products driven by artificial intelligence	Ali SIADAT, Alain ETIENNE, Jelena PETRONIJEVIC	ali.siadat@ensam.eu; alain.etienne@ensam.eu; jelena.petronijevic@ensam.eu	Laboratoire de Conception, Fabrication, Commande (LCFC)
44	Design, Industrialization	Industry 4.0/Smart factory	Cloud manufacturing	K BENFRIHA, A AOUSSAT	Khaled.benfriha@ensam.eu	LCPI
45	Design, Industrialization	Numerical optimization algorithms	Design optimization using manufacturing processes	K BENFRIHA, A AOUSSAT	Khaled.benfriha@ensam.eu	LCPI
46	Information and Communication Sciences and Technologies	Computer Science, Virtual reality	Intuitive 3D Interactions for Mobile Mixed Reality – Application to the factrory of the future	Fakhreddine Ababsa	Fakhreddine.Ababsa@ensam.eu	LISPEN / Institut Image
47	Information and Communication Sciences and Technologies	Robotics, Augmented Reality	Human–Robot Collaboration in Integrated Manufacturing using Augmented Reality	Fakhreddine Ababsa	Fakhreddine.Ababsa@ensam.eu	Institut Image / LISPEN

PHD PROPOSALS – ARTS ET MÉTIERS 5/5

No	ParisTech Research field	Subfield	Title	Advisor(s) Name	Advisor(s) Email	Research/Lab group
48	Materials Science, Mechanics, Fluids	Applied Physics, Mech. Eng.	VACUITY: innoVative mAgnetron Cathode for modUlarly deposITion sYstem	A. Besnard, C. Nouveau	aurelien.besnard@ensam.eu; corinne.nouveau@ensam.eu	LaBoMaP
49	Materials Science, Mechanics, Fluids	Mechanical engineering, numerical simulation	Measurement of residual stresses in materials: FEM-based simulation of X-ray diffraction	Dorian Depriester, Laurent Barralier	dorian.depriester@ensam.eu; laurent.barrallier@ensam.eu	MMS/MSMP (EA7350)
50	Energy, Processes	Applied Physics	Efficiency enhancement of the compressed air energy storage (CAES) process	Michaël Pereira, Mathieu Specklin	michael.pereira@ensam.eu, mathieu.specklin@ensam.eu	LIFSE
51	Materials Science, Mechanics, Fluids	Mechanical Engineering	Surface integrity of Ti-6Al-4V alloy components produced by SLM and machining processes: multiphysics simulations and experimental validation	José Outeiro, Abdelhadi Moufki	jose.outeiro@ensam.eu; abdelhadi.moufki@univ-lorraine.fr	LABOMAP and LEM3
52	Information and Communication Sciences and Technologies	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	frederic.segonds@ensam.eu; ruding.lou@ensam.eu	LCPI / LISPEN
53	Materials Science, Mechanics, Fluids	Mechanical/Material/Process Engineering	Optimization of Robotic Friction Stir Welding through monitoring	Tudor BALAN, Sandra CHEVRET, Laurent LANGLOIS	tudor.balan@ensam; sandra.chevret@ensam.eu; laurent.langlois@ensam.eu	LCFC
54	Design, Industrialization	Robotic manufacturing, Grinding, Finishing process, Forged workpieces	Automation of a flexible and agile finishing process of forged workpieces with industrial robots	Régis BIGOT, Cyrille BAUDOUIN, Sandra CHEVRET	regis.bigot@ensam; cyrille.baudouin@ensam.eu; sandra.chevret@ensam.eu	LCFC
55	Materials Science, Mechanics, Fluids	Mech. Engineering, Applied mathematics, Environmental sciences	Simulation of biomass pyrolysis and combustion in fixed-bed reactors	Azita Ahmadi, Jean Lachaud	azita.ahmadi-senichault@u-bordeaux.fr; jean.lachaud@u-bordeaux.fr	Institute of Mechanical Engineering (I2M)
56	Materials Science, Mechanics, Fluids	Mechanical Engineering, computational mechanics	Prediction of plastic buckling for thin structures using advanced constitutive models	Farid ABED-MERAIM, Mohamed BEN BETTAIEB	Farid.AbedMeraim@ensam.eu; Mohamed.BenBettaieb@ensam.eu	Laboratoire d'Etude des Microstructures et de Mécanique des Matériaux (LEM3), UMR CNRS 7239
57	Materials Science, Mechanics, Fluids	Mechanical Engineering, computational mechanics	Improved numerical multiscale approaches for the prediction of the ductility limit of polycrystalline materials	Farid ABED-MERAIM, Mohamed BEN BETTAIEB	Farid.AbedMeraim@ensam.eu; Mohamed.BenBettaieb@ensam.eu	Laboratoire d'Etude des Microstructures et de Mécanique des Matériaux (LEM3), UMR CNRS 7240
58	Materials Science, Mechanics, Fluids	Mechanical Engineering, computational mechanics	Prediction of the bendability limits during sheet metal forming processes	Farid ABED-MERAIM, Mohamed BEN BETTAIEB	Farid.AbedMeraim@ensam.eu; Mohamed.BenBettaieb@ensam.eu	Laboratoire d'Etude des Microstructures et de Mécanique des Matériaux (LEM3), UMR CNRS 7241

PARISTECH – CSC PHD PROGRAM

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国家留学基金管理委员会 · CHINA SCHOLARSHIP COUNCIL ·

Arts et Métiers Sciences et Technologies

L2EP Laboratoire d'électrotechnique et d'électronique de puissance de Lille

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

Research domains: Electrical Engineering, Control, Electrical Grid

Electrical Grid Teams (Power electronics and Power in the Loop)

Team leader

B. Robyns

Control Team (Graphical and Vectorial Formalisms / Transportation)

Team leader

A. Bouscayrol

Numerical Tools and Method Team (Digital Twin and Reduced Order Modeling)

Team leader

M Tounzi

KEY FACTS / FIGURES

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 PEUGEOT CITROËN

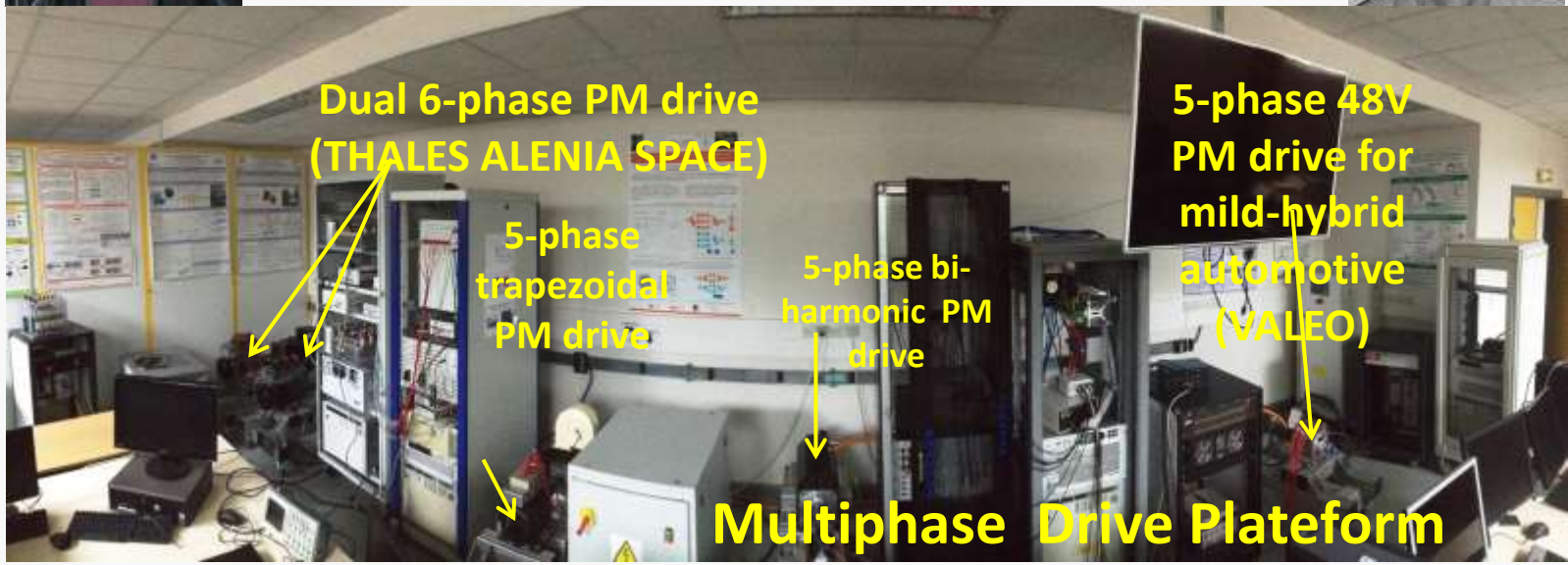
Academic Partners: Universities Saitama, Harbin, Shandong, Beijing, Madrid, Valencia, Sevilla, Aalto, Aalborg, Québec, Mac Gill, Toronto, Akron, Florianopolis, Cordoba, Cluj, Sofia, Bruxelles, Lausanne, Alger, Sfax, Modena, Torino, Eindhoven

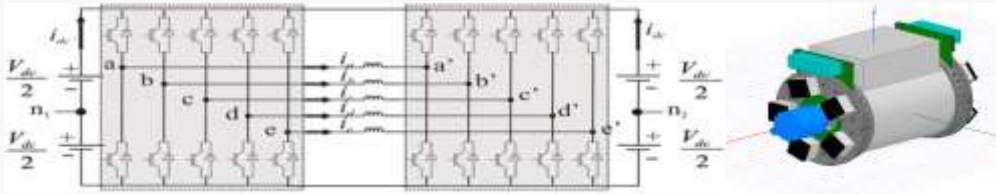
Lab's or staff's' recent Awards
- H2020 EU project leader – PANDA (2018-2022)- MULTITOUCH (2019-2023)

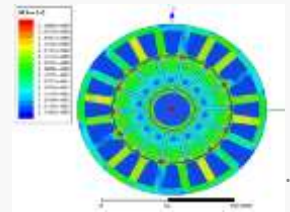
CONTROL TEAMS

DESIGN AND CONTROL OF FAULT TOLERANT MULTIPHASE DRIVES
VECTORIAL AND GRAPHICAL FORMALISMS

Ngac-Ky Nguyen (orcid.org/0000-0001-8376-6164)
Eric Semail (orcid.org/0000-0001-8565-1707)
(42 journals/93 International Congress)
(5 Patents/ 4 book chapters/ 1 book)



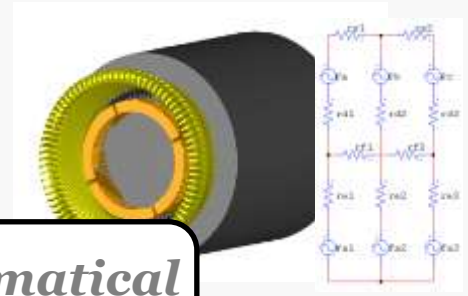


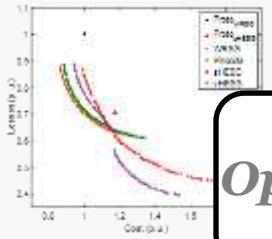


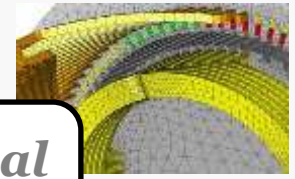
Numerical Tools and Method Team

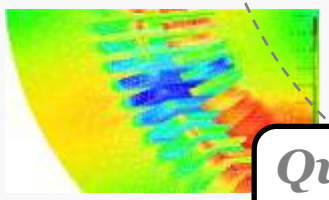
Development of models for the optimal design and the study of electromagnetic systems in their environment

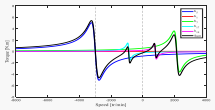
Stéphane Clénet
(researchgate.net/profile/Stephane_Clenet)
(117 Journals/136 International Congress)











Real device

Mathematical model

Optimisation

Numerical model

Quantities of Interest

code_Carmel

https://code-carmel.univ-lille.fr/

ParisTech
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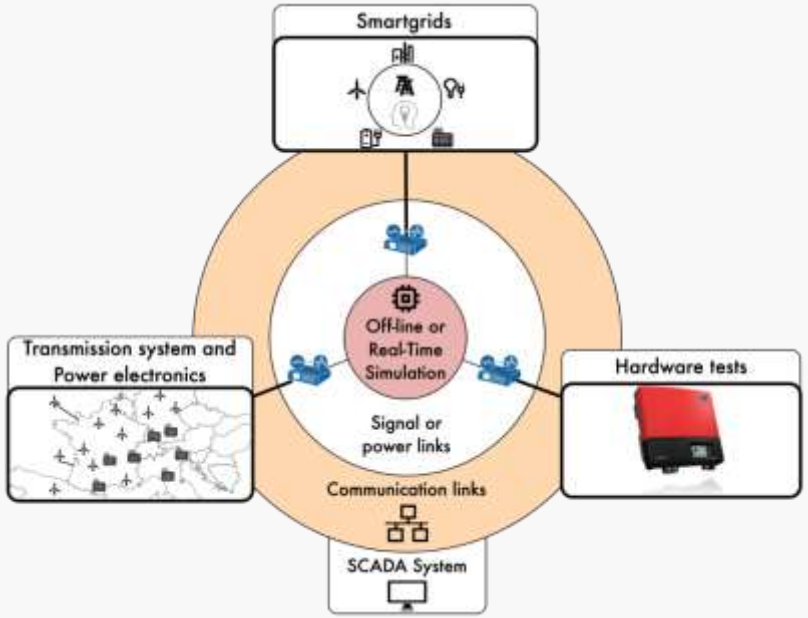
POWER SYSTEM TEAM

2 scientific skills

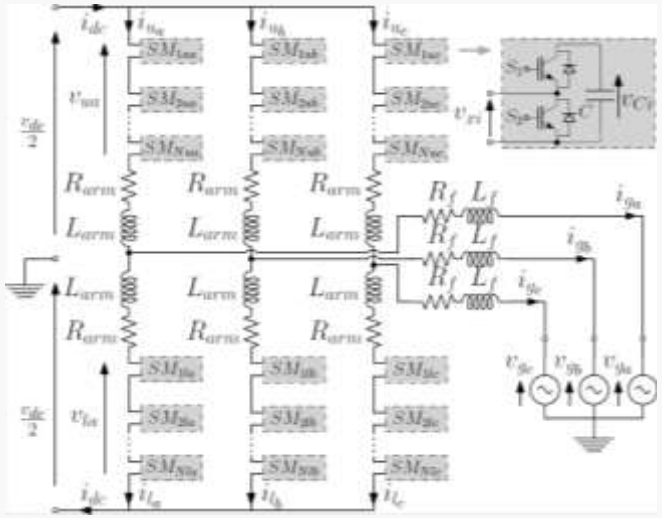
- ✓ **Transmission system and power electronics**
- ✓ **Smart grids**

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/

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Arts et Métiers Sciences et Technologies

LaBoMaP
LABORATOIRE BOURGUIGNON DES MATÉRIAUX ET PROCÉDÉS

Head of the lab: Pr. G. Poulachon

LaBoMaP : Laboratoire Bourguignon des Matériaux et Procédés

Research domains:

This lab is involved in scientific and partnership research in the field of manufacturing processes, especially machining process by work material removal and material science.

The **HSM (High Speed Machining) team** of LaBoMaP aims to study and to model the machining operations in various work materials, in particular difficult-to-cut materials, such as: titanium and nickel based alloys, hardened steels and composite materials

Team leader

Guillaume FROMENTIN
Full Professor

The **MSE (Materials and Surfaces Engineering)** aims to develop surface coatings and to characterize bulk materials

Team leader

Corinne NOUVEAU
Associate Professor, HDR

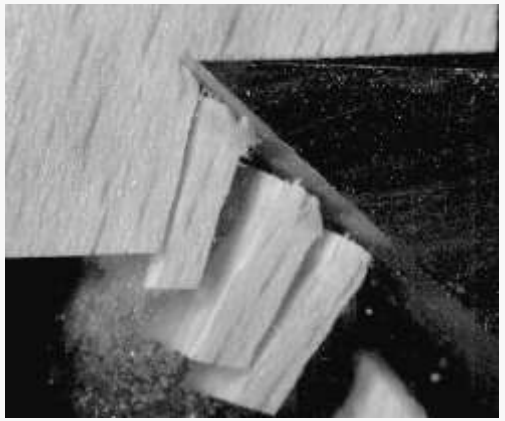
The **WMM (Wood Material and Machining)** aims to improve the use of local hardwood species. The high-level experimental platform allows the characterization and the modeling of wood-based products

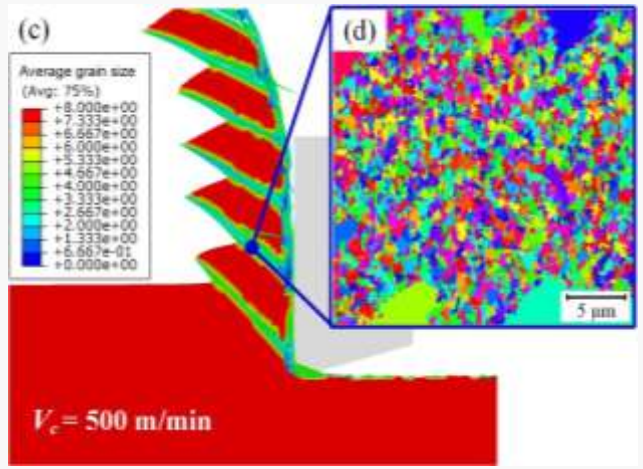
Team leader

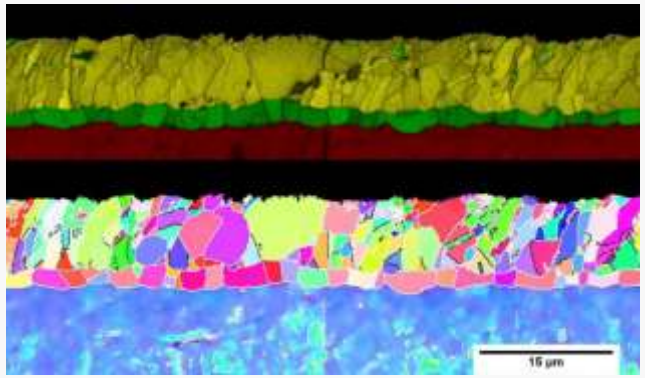
Louis DENAUD
Associate Professor, HDR

LaBoMaP : Laboratoire Bourguignon des Matériaux et Procédés

Research infrastructures







Key researchers

Prof. J.C. Outeiro
PhD, DSc (habil.), FCIRP
HSM Team, h-index: 23

Prof. Aurélien Besnard
MSE Team, h-index: 10

Key facts / figures

Number of researchers : 15
14 PhD students and 3 post-doc : 30 % of international students

Number of publications
53 papers in 2 years

Number of patents : 4 patents in 2 years

Prestigious partnerships with academic laboratories :
Xi'an Jiaotong University (China), IIT Bombay (India), University of Kentucky (USA), Karlsruhe Institute of Technology (Germany), RWTH Aachen University (Germany), Namur University (Belgium), University of Brescia (Italy), University de la Calabria (Italy), Technical University of Lisbon, University, Bourgogne-Franche-Comté, Sigma (France), ENISE (France),...

Main Companies:

RENAULT, SAFRAN, AIRBUS, Saint Jean Industries, PSA Groupe, ICS, evatec tools, SECO

Lab's or staff's' Awards:
Nomination Fellow Member of the International Academy for Production Engineering (CIRP) : G. Poulachon & J.C. Outeiro

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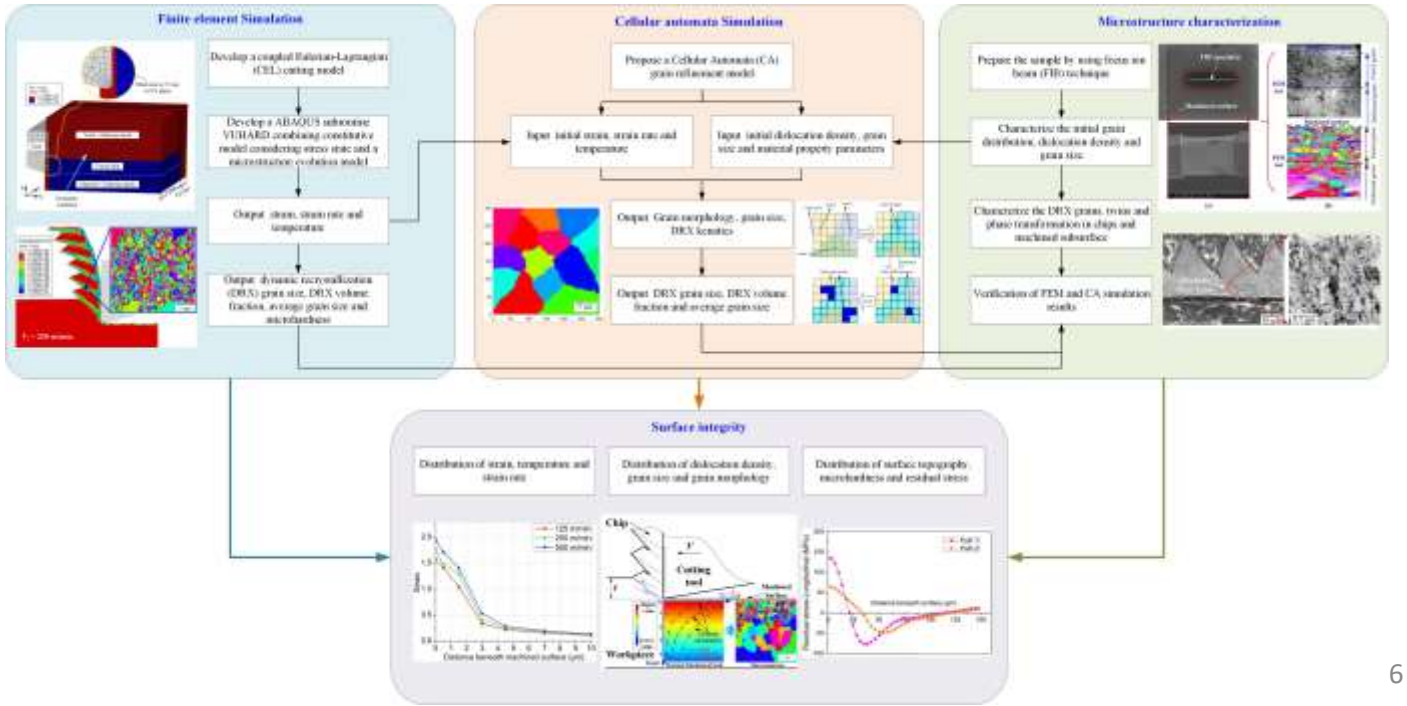
HSM/PhD: Dual degree PhD between *Arts et Métiers Institute of Technology* and *Xi'an Jiaotong University* (XJTU) (in progress)

Modelling of the microstructure evolution of the machined surface during high speed machining

During high-speed machining (HSM), the strong thermal-mechanical coupled phenomena can lead to the microstructure evolution in the cutting zone. The transmission electron microscope (TEM) and precession electron diffraction (PED) are applied to characterize the microstructure evolution in both chip and machined surface. A multiscale model is developed to investigate the grain refinement induced by dynamic recrystallization occurring in HSM of Ti6Al4V, through finite element (FE) and cellular automata (CA) methods to achieve a more comprehensive understanding of the microstructure evolution and its effect on mechanical behavior during HSM.

Publications:

1. X. Xu, J.C. Outeiro, J. Zhang, B. Xu, W. Zhao, "Machining Simulation of Ti6Al4V using Coupled Eulerian-Lagrangian Approach and an Improved Constitutive Model", International Journal of Mechanical Sciences (under review).
2. X. Xu, Jun Zhang, J.C. Outeiro, B. Xu, W. Zhao, Multiscale simulation of grain refinement induced by dynamic recrystallization of Ti6Al4V alloy during high speed machining, Journal of Materials Processing Technology, Vol. 286, 2020.
3. J. Zhang, X. Xu, J.C. Outeiro, H. Liu, W. Zhao, Simulation of Grain Refinement Induced by High Speed Machining of OFHC Copper using Cellular Automata method, ASME Journal of Manufacturing Science and Engineering, Vol. 142, 2020.



HSM/PhD (in progress)

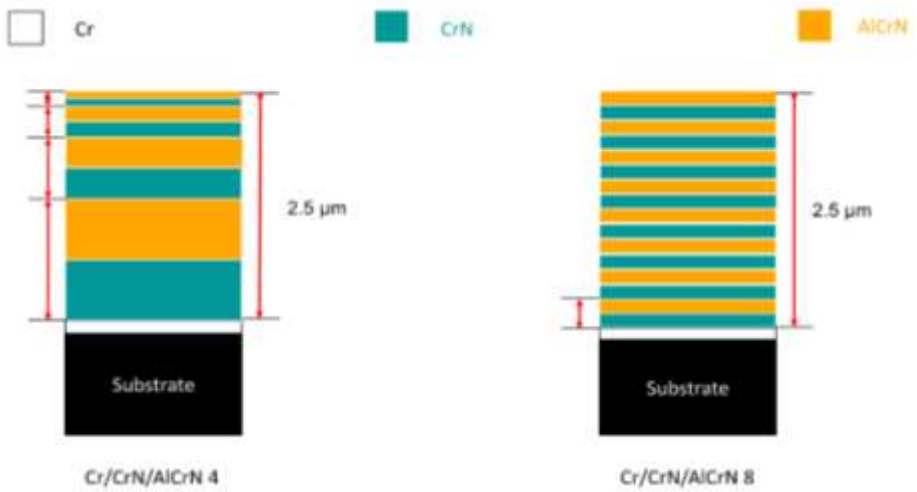
Development of New Coatings for Improved Performance of Cutting Tools in Cryogenic Assisted Machining of Aeronautic Alloys

The aim of this PhD thesis is to develop suitable multilayers PVD coatings for cryogenic assisted machining of Ti-based alloy.

Publications:

1. Y. Zhang, C. Nouveau, J.C. Outeiro, "Optimization of AlCrN monolayers and Cr/CrN/AlCrN multilayers coating for cryogenic assisted machining", Surface and Coatings Technology, 2020 (under review).

1. Y. Zhang, C. Nouveau, J.C. Outeiro, A. Besnard, B. Julliere, S. Dezecot, "Optimization of AlCrN monolayers and Cr/CrN/AlCrN multilayers for metal forming and machining applications", Plasma Thin Film International Union Meeting (PLATHINIUM), Antibes, French Riviera, September 23-27, 2019.



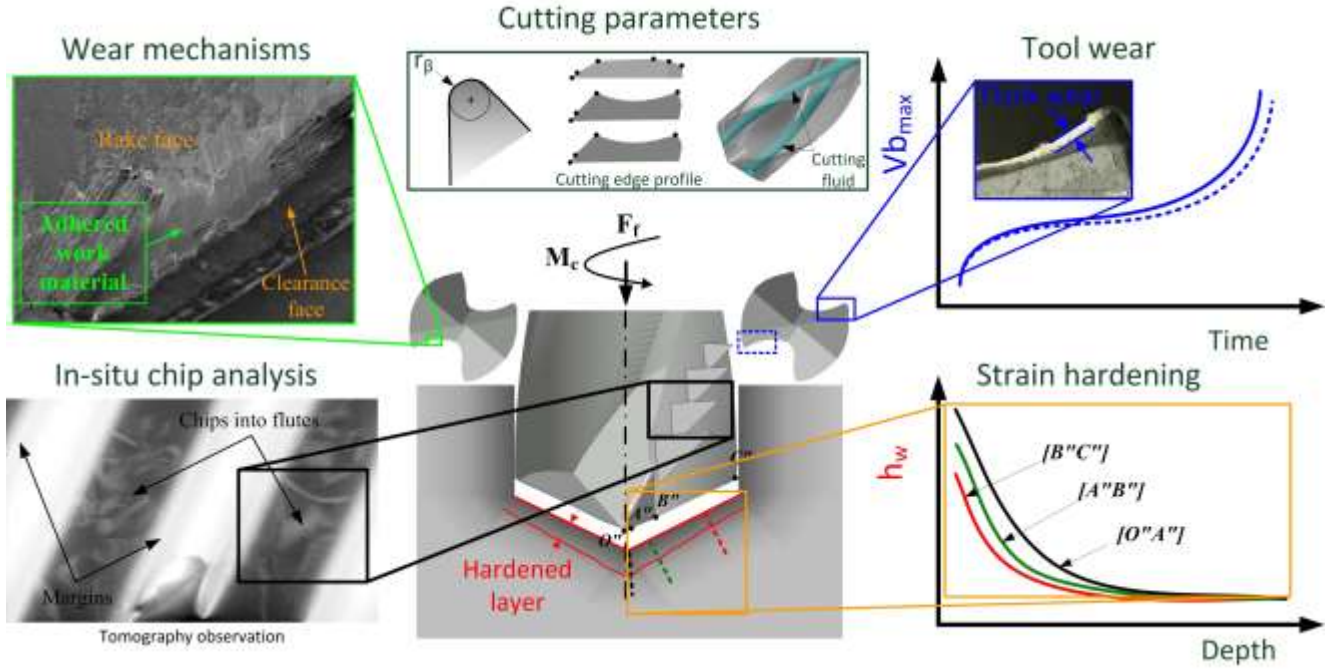
HSM/PhD

Mechanical and metallurgical analysis in drilling of refractory stainless steel

In the case of the turbocharger housings machining (milling, drilling and tapping operations) made of heat resistant austenitic stainless steel (HRASS), the tools life is greatly altered compared to standard steels of equivalent mechanical resistance. This PhD project aims to develop a new cutting geometry optimized for the HRASS drilling.

Publications:

1. Arif R., Fromentin G., Rossi F., et Marcon B. Investigations on drilling performance of high resistant austenitic stainless steel. Journal of Manufacturing Processes, 56:856 866, 2020.
2. Arif R., Fromentin G., Rossi F., et Marcon B. Investigations on strain hardening during cutting of heat resistant austenitic stainless steel. Journal of Manufacturing Science and Engineering, 124(5):1 14, 2020.
3. Arif R., Fromentin G., Rossi F., et Marcon B. Mechanical analysis of local cutting forces and transient state when drilling of heat-resistant austenitic stainless steel. The International Journal of Advanced Manufacturing Technology, 104(5 8):2247 2258, 2019.



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Arts et Métiers Sciences et Technologies

LABORATOIRE D'INGÉNIERIE DES SYSTÈMES PHYSIQUES ET NUMÉRIQUES

(LISPEN LABORATORY)

lispen

Research domains: Multi-physics, multi-scale and virtual dynamical systems for industry

System engineering and digital model

Team leader

Lionel Roucoules

Virtual Immersion technologies and uses

Team leader

Frédéric Merienne

Robotics, HRI, Nonlinear dynamics and vibrations, operational efficiency

Team leader

Richard Béarée

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RESEARCH INFRASTRUCTURES

Scalable 4.0 factory
(Lille)

Institut image
(Chalon-sur-Saône)

(Aix-en-Provence)

KEY FACTS / FIGURES

Number of teacher-researchers : 26
Number of PhD candidates : 32 including 25 % of international PhD candidates
Number of post-docs: 4

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

Number of filed patents > 20

Prestigious partnerships with companies

SAFRAN, U C, cea, UNIVERSIDADE DE COIMBRA, eurocopter an EADS Company, Valeo, RENAULT, SNCF

Lab's or staff's' recent Awards

- H2020 EU project leader – Colrobot 2015-2019
- Safran Innovation Award 2018

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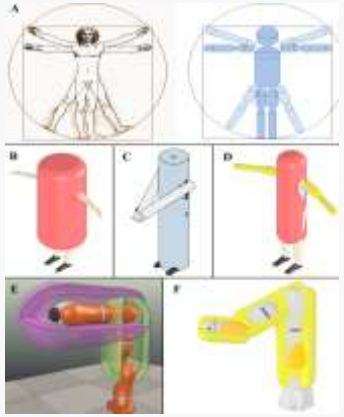
Sample typical research projects:



Mohammad Safeea's Joint PhD supervision with Univ. Of Coimbra (Portugal)

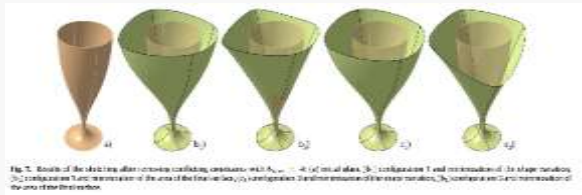
« *Safe Collaborative Robotic Manipulators* » 2017-2020

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

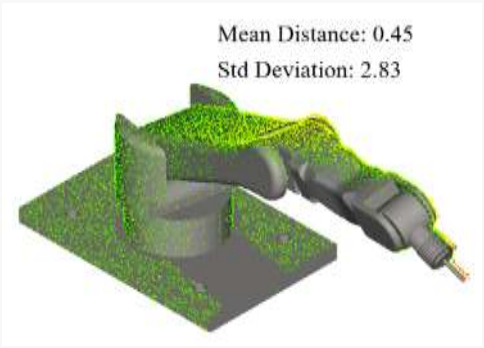
1 paper (IEEE Access)
3 Communications in int. conf. (IEEE VR, ICITS)



Hao HU – PhD granted by CSC

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

1 paper (Computer Aides Design)



Sijie HU (2019–) – PhD granted by CSC

« *Deep learning-based identification and fitting of CAD models from point clouds* »
2019 -

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Arts Sciences et Technologies et Métiers

LABORATOIRE DE MÉCANIQUE DES FLUIDES DE LILLE

ARTS ET MÉTIERS, CAMPUS OF LILLE

Laboratoire de Mécanique des Fluides de Lille Kampé de Fériet

LABORATOIRE DE MÉCANIQUE DES FLUIDES DE LILLE

Research domains: 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

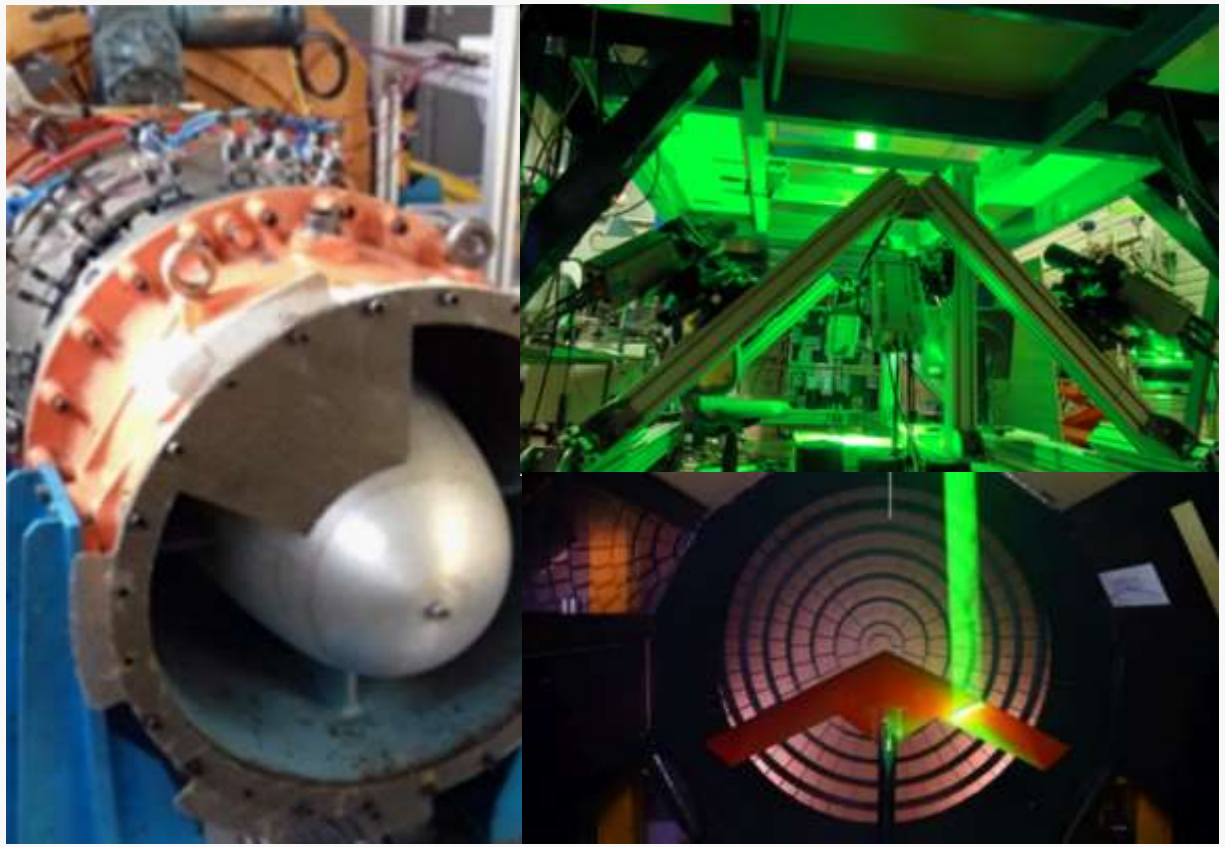
Team leader

Olivier RENIER

LABORATOIRE DE MÉCANIQUE DES FLUIDES DE LILLE

RESEARCH INFRASTRUCTURES

Rotating Flows, Turbulence, Flight Dynamics



KEY RESEARCHERS

CHRISTOS VASSILICOS /
h index 47

JEAN-PHILIPPE LAVAL /
h index 21

KEY FACTS / FIGURES

38 permanent people (researchers, research professors, engineers and technicians) and about 25 non-permanent researchers (PhD candidates and post-docs).

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

Prestigious partnerships with academic laboratories, companies

VIRGINIA TECH

SAFRAN

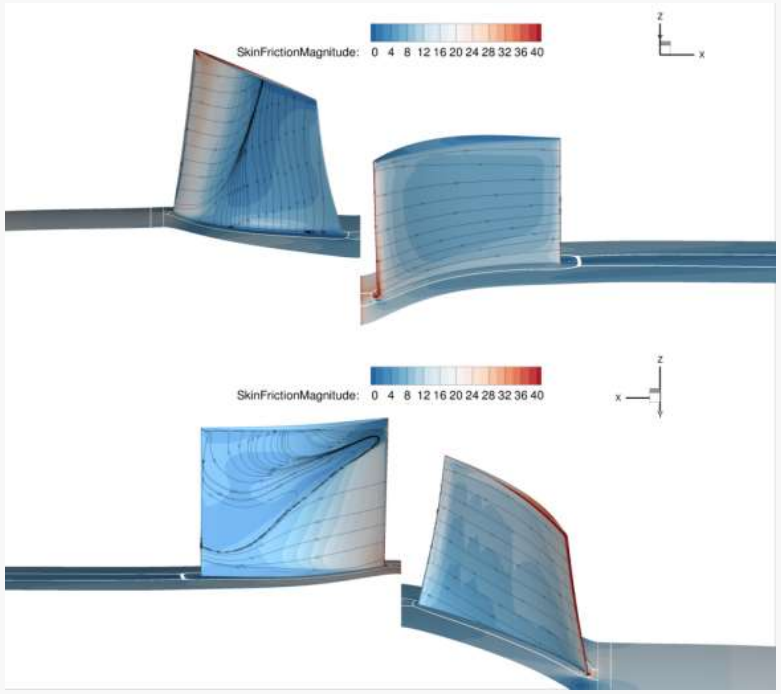
Imperial College London

ariane GROUP

EuHIT

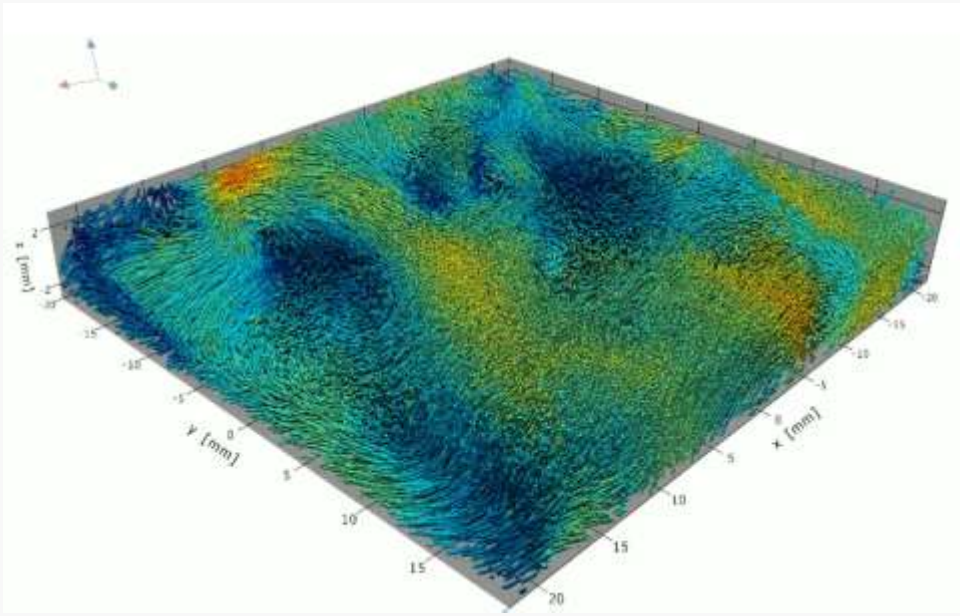
LMFL is a member of EUHIT : European Consortium that aims at integrating cutting-edge European facilities for turbulence research

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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Arts et Métiers Institute of Technology

LABORATOIRE DE CONCEPTION FABRICATION COMMANDE

LCFC Conception Fabrication Commande

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Research domain: Manufacturing of the Future

Integrated product & process design

Team leader

Pr. Jean-Yves DANTAN
101 documents ; h-index: 20

Advanced manufacturing technology

Team leader

Pr. Régis BIGOT
103 documents ; h-index: 15

Control and Command

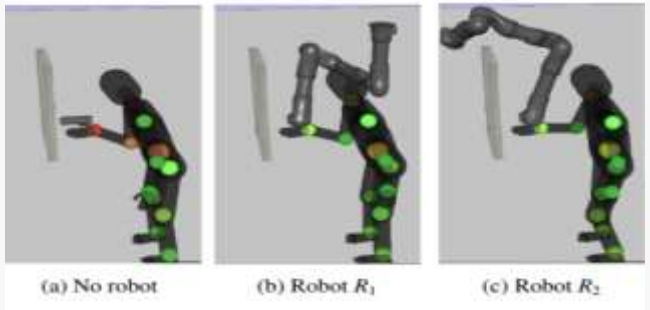
Team leader

Pr. Gabriel ABBA
85 documents ; h-index: 16

RESEARCH INFRASTRUCTURES

ABB 8700 manufacturing multi-process robot

Vulcain platform



Design of robotized production systems

KEY RESEARCHERS

PR. ALI SIADAT
128 Documents ; h-index: 17

DR. TUDOR BALAN
63 documents ; h-index: 14

KEY FACTS / FIGURES

Number of teacher-researchers : 24 including 5% of international members

Number of researcher: 4

Number of doctoral students: 24 including 67% of international doctoral students

Number of post-docs: 1

Number of publications: 28 in international journals in 2019

Number of international co-publications: 10 in 2019

Prestigious partnerships with academic laboratories, companies

KIT Karlsruhe Institute of Technology
University of Tehran
TECHNICAL UNIVERSITY
INSTITUT DE SOUDURE
MANOIR INDUSTRIES
Setforge
ACM
THALES
Valeo
RENAULT
thyssenkrupp

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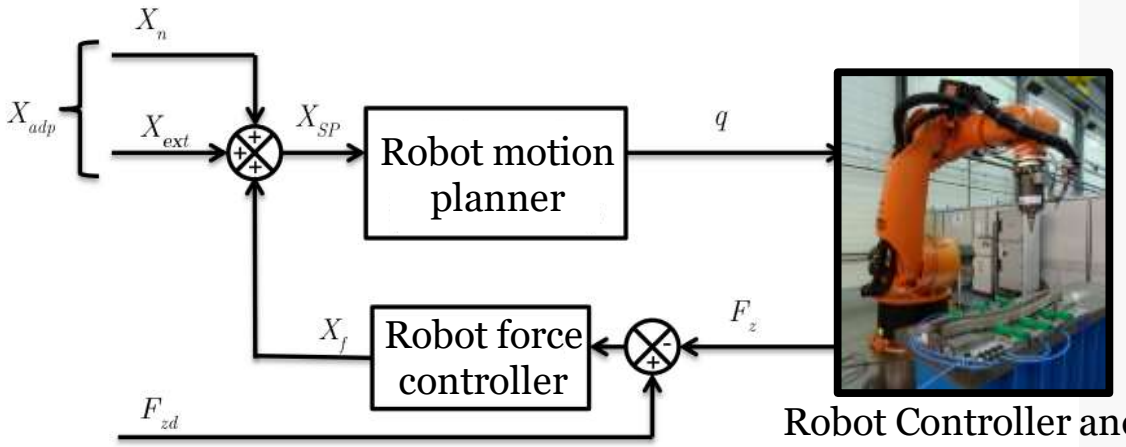
PATH CORRECTION OF AN INDUSTRIAL ROBOT USED FOR FRICTION STIR WELDING

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



Robot Controller and robot in interaction with the workpiece

4 Papers in *Industrial Robot : An International Journal*

1 Book chapter

13 international conferences with proceedings
4 international conferences presentation

Due to their lack of stiffness robots undergo elastic deformation under the effect of high process forces. This causes a welding tool path deviation which induces defects in the weld seam.

The research work accomplished was to predict the position and orientation deviations along the weld seam and based on this knowledge to enable a synthesis of a path programming approach adapted for robotic FSW.

This novel approach is based on approximations of the adapted path by Bézier or B-splines curves.

Experimental validations showed an average residual tool path deviation of 0.3 mm and weld seams without defects. *(initial tool path deviation: 2,8mm)*

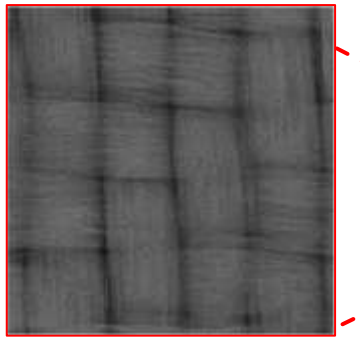
Experimental and numerical investigation of non-local damage in polymer based composites accounting for hygro-thermo-mechanical couplings

PhD supervisors:

Adil Benaarbia (adil.benaarbia@ensam.eu)
George Chatzigeorgiou (georges.chatzigeorgiou@ensam.eu)
Fodil Meraghni (fodil.meraghni@ensam.eu)

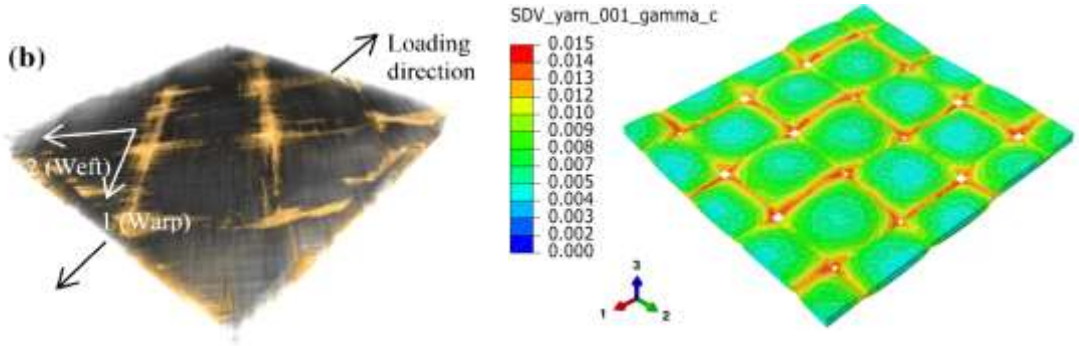
MICROSTRUCTURES
MÉCANIQUE
MATÉRIAUX

Project motivation



Micro-structure

Composite structure



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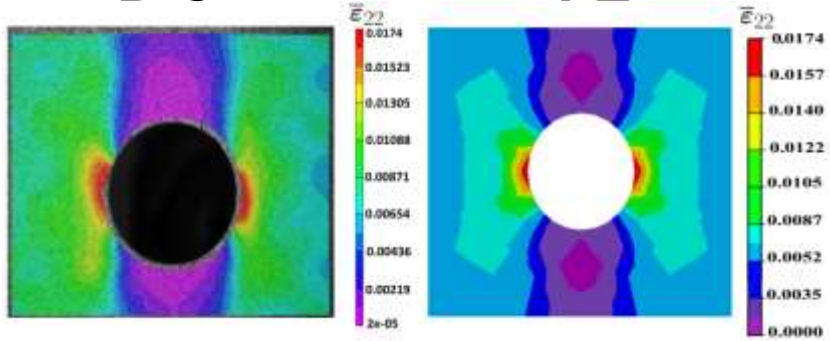


[PhD : E. Tikarrouchine, P. Pomarède]

Thermoplastic matrix ➡ VEVPD, T°, RH

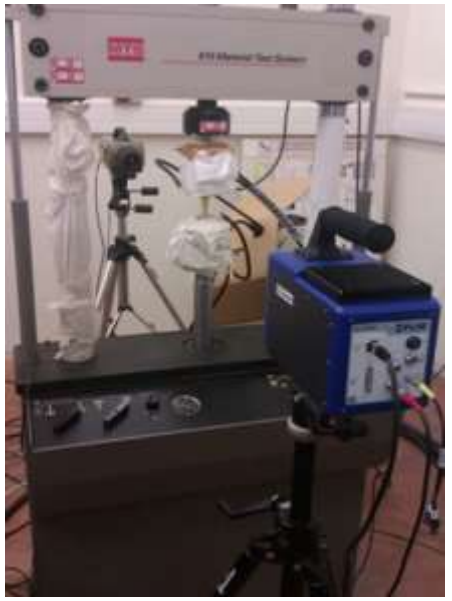
Architectural reinforcement ➡ woven…

- Microstructure effects
- Thermomechanical behaviour
- Water content effect

❱ Localization and damage modelling ⟶ **Non local approaches**

Task 1 : Experimental investigation (thermomechanical characterization):

Hydraulic testing machine	Uni-axial loading (monotonous, cyclic,...)
Infrared Thermography	Calorimetric fields (self-heating, dissipation)
Digital Image Correlation	Kinematic fields (strain, strain rate, acceleration,…)



[Benaarbia et al., 2014]

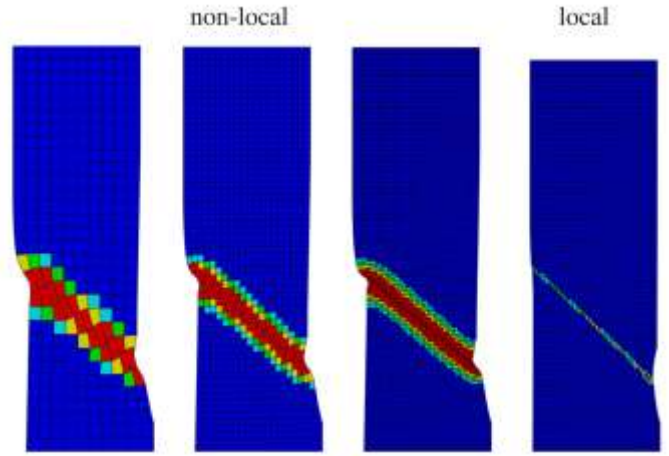
Task 2 : Predictive multi-scale numerical modelling:

Regulate the ill-posed character of the problem using a non local model (gradient enhanced : $\nabla\varepsilon, \nabla D$)

Microscopic scale

↕ Periodic homogenization

Macroscopic scale



[Seupel et al. 2018]

PHD PROPOSAL:
PHASE FIELD FRACTURE MODELLING OF SHAPE MEMORY ALLOY ACTUATORS FOR AEROSPACE APPLICATIONS

Advisors:

- ***Prof. Fodil MERAGHNI***
- ***Dr. Francis PRAUD***
- ***Dr. Boris PIOTROWSKI***

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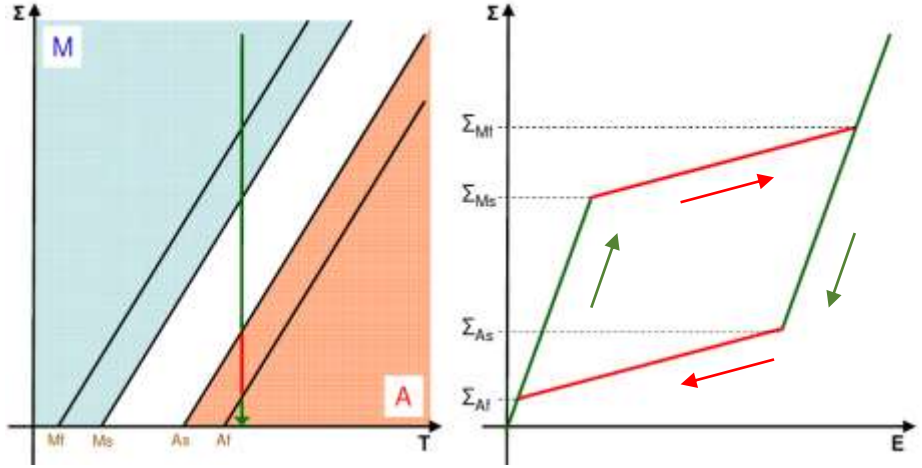
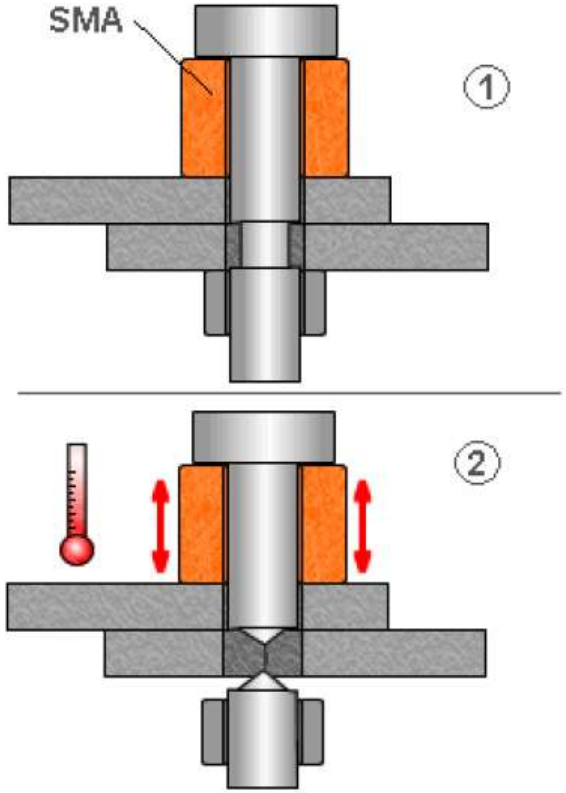
PHASE FIELD FRACTURE MODELLING OF SHAPE MEMORY ALLOY ACTUATORS FOR AEROSPACE APPLICATIONS

- **Shape Memory Alloys (SMAs) have a great potential in various engineering and aerospace applications:**
  - Actuators
  - energy absorption, and damping devices

- **This is achieved thanks to their unique thermo-mechanical behavior resulting from the austenite/martensite phase transformation:**





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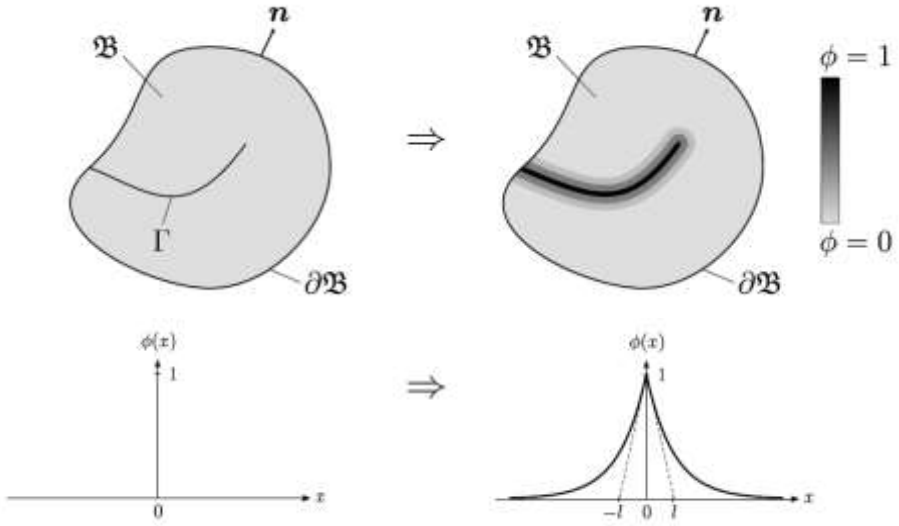
PHASE FIELD FRACTURE MODELLING OF SHAPE MEMORY ALLOY ACTUATORS FOR AEROSPACE APPLICATIONS

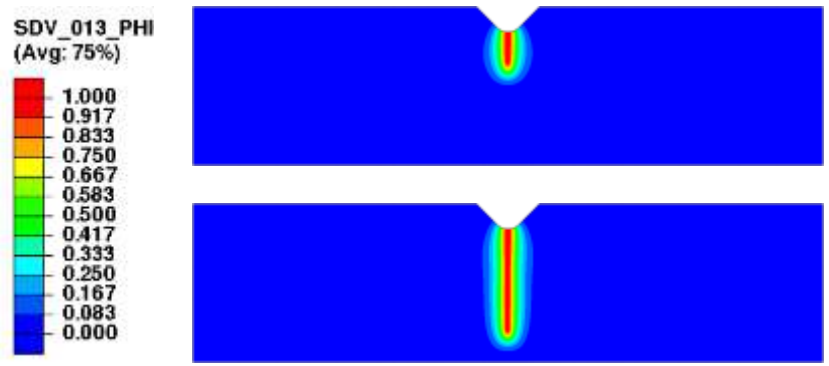
- **Under extreme thermomechanical loading, it becomes important to predict the response of SMAs upon fracture.**

- **To this end, the Phase Field Fracture (PFF) method can be extended to inelastic SMAs constitutive models.**

- **The PFF method is based on the variational approach to fracture, through the energy minimization principle and a diffuse representation of crack surfaces:**



Crack phase field, showing a crack propagation in a notched bar



Work of *F. Praud et al. 2020*

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MSMP/ ARTS ET MÉTIERS
MECHANICS, SURFACES AND MATERIALS PROCESSING

DIRECTOR: MOHAMED EL MANSORI

MSMP Mechanics, Surfaces and Materials Processing

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MECHANICS, SURFACES AND MATERIALS PROCESSING

Research domains: Future manufacturing processes, material science, mechanics

Mechanics, Materials and Surfaces (simulation of microstructures and the mechanical couplings induced by the processes)

Team leader

Laurent Barrallier

Multiphysical and multiscale approach to manufacturing processes (full scale manufacturing processes)

Team leader

Mohamed El Mansori

MECHANICS, SURFACES AND MATERIALS PROCESSING

KEY FACTS / FIGURES

Number of teacher-researchers : 25-30 (20% international)
Number of PhD candidates : 10 including 25 % of international PhD candidates
Number of ingeneers & administratives :10
Number of post-docs: 2

Number of publications > 200

Number of filed patents > 5

Prestigious partnerships with academic laboratories, companies:

SAFRAN
AIRBUS HELICOPTERS
eurocopter an EADS Company
RENAULT
Association INSTITUTS CARNOT
SIEMENS Ingenuity for life
eDF
l'Europe s'engage en France
TEXAS A&M UNIVERSITY at QATAR
PSA GROUPE

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Research domains MMS : Optimization of the microstructure to improve the performance of mechanical parts

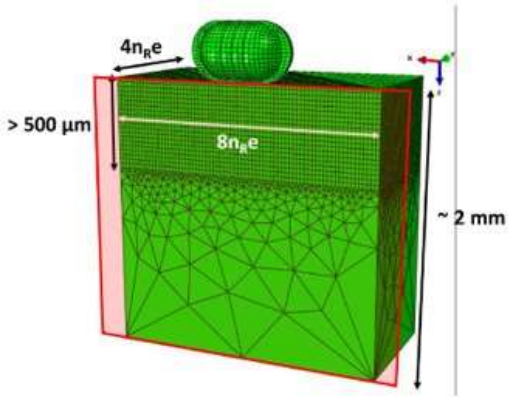
From the microstructure to the mechanical properties of materials

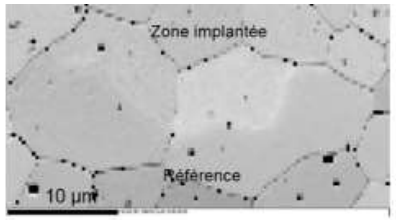
AXE 1 : Mechanics of the surfaces and materials with microstructure gradient

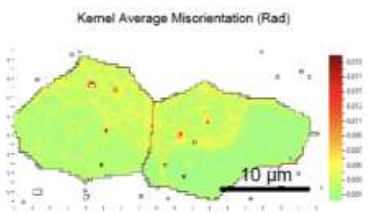
AXE 2 : Residual stresses generation and mechanical fields

AXE 3 : Thermochemical and mechanical surface treatments

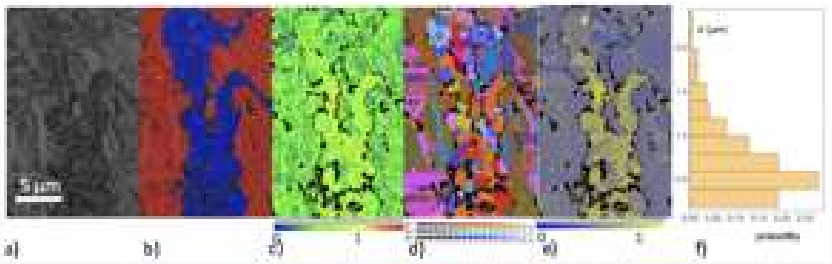
- Diffraction methods for the mechanical states analysis
- Full kinematic field measurements / mechanical tests, identification methods
- Digital materials

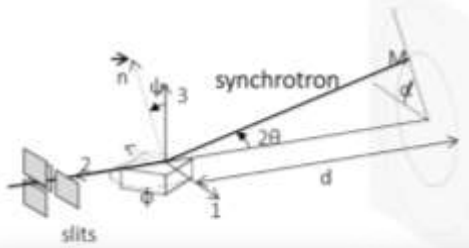






HREBSD





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)
- …

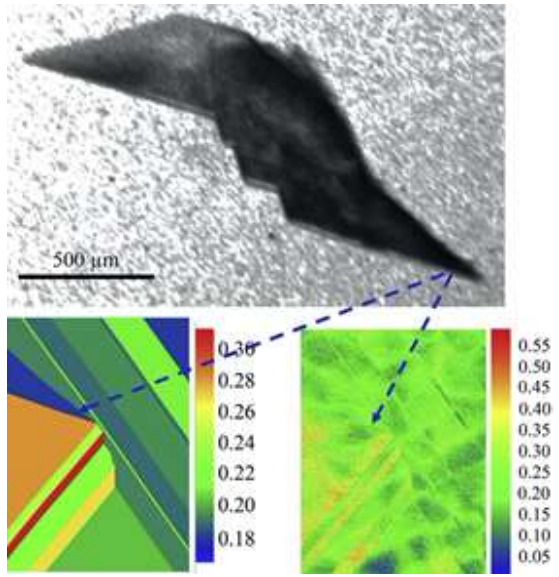
Gases reactive facilities | SEM | Mono impact | X-ray diffractometer | Dig.mat.

Some MMS PhD projects:

Development of non-destructive characterization method using X ray diffraction line profile analysis and synthetic materials

Subject 28

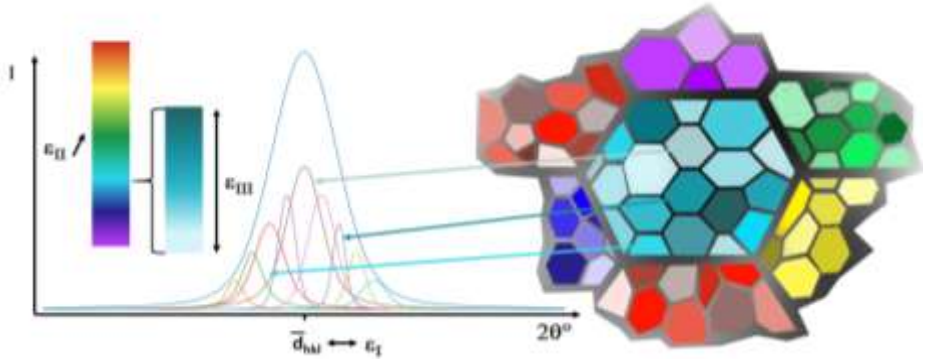
Dr. Lorène Héraud



Measurement of residual stresses in materials: FEM-based simulation of X-ray diffraction

Subject 49

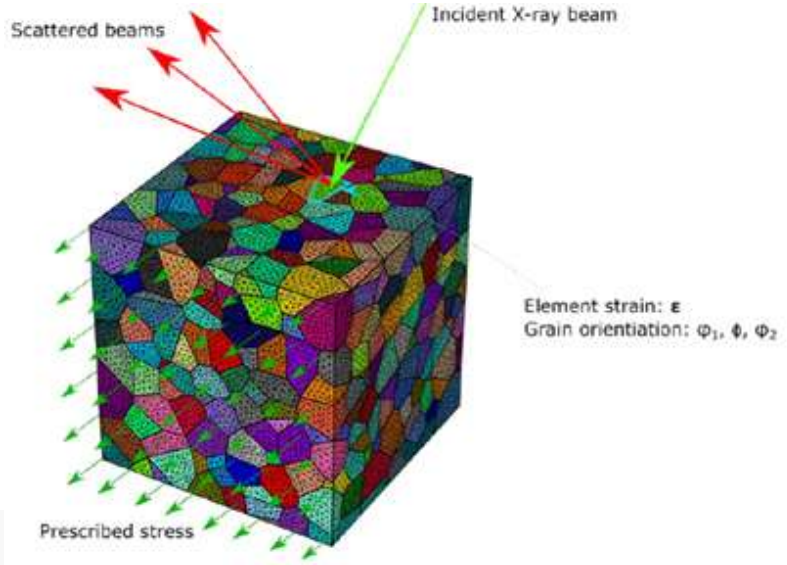
Dr. Dorian Depriester



Multiscale stress/strain analysis of polycrystalline silicon for photovoltaic applications

Subject 21

Pr. Laurent Barrallier



PARISTECH – CSC PHD PROGRAM

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Arts et Métiers Sciences et Technologies

I2M/ ARTS ET MÉTIERS

(JOINT UNIT RESEARCH WITH BORDEAUX UNIVERSITY, CNRS AND BORDEAUX INP)

INSTITUTE OF MECHANICS AND MECHANICAL ENGINEERING

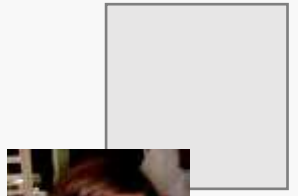
DIRECTOR: JEAN-CHRISTOPHE BATSALE

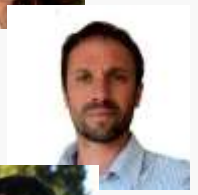
I2M BORDEAUX INSTITUT DE MÉCANIQUE ET D'INGÉNIERIE

I2M : Institute of Mechanics and Mechanical Engineering

Research domains:

Physical Acoustics	Team leader	Olivier Poncelet
Civil and Environmental Engineering	Team leader	Nadia Saiyouri
Durability of Materials, Assemblies and Structures	Team leader	Nicolas Saintier
Fluids and Transfert	Team leader	Wahbi Jomaa
Material Processes Interactions	Team leader	Mehdi Chérif
Mechanical Engineering and Design	Team leader	Nicolas Perry






KEY FACTS / FIGURES

Number of researchers : 132 (71 full time equiv.)
115 PhD students and 20 post-doc
(30 % of international students)

Number of publications
163 papers per year
(mean value over the last 5 years)

Number of patents : 5 patents
during the last 5 years

Prestigious partnerships with foreign Labs & Universities:
Bilbao University (Spain),
Monash Univ. & Queensland Univ. (Australia),
Tokyo Univ. & Tokyo Tech (Japan),
University of Laval (Canada)

Main Companies:

Lab's or staff's' Awards:
1 Bronze CNRS Medal
2 Prizes of the French Acad. Science

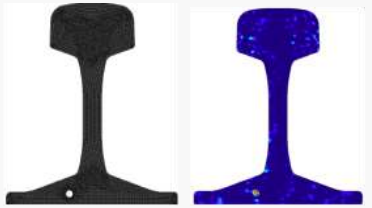
Physical Acoustics

(Dr Olivier PONCELET)

✓ Aim

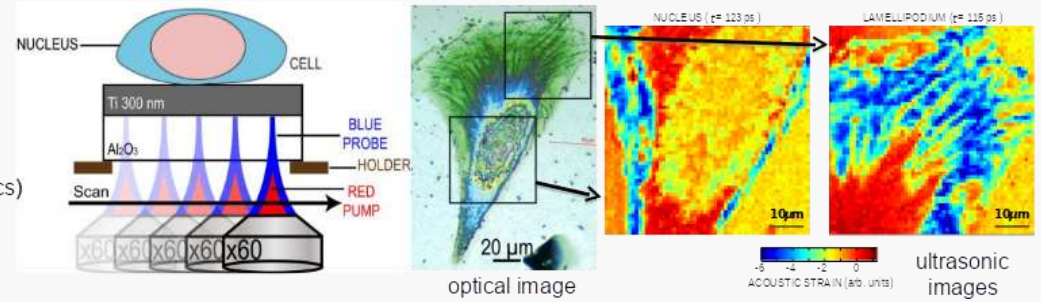
Research on elastic-waves propagation, generation and detection in inhomogeneous media (random, structured/periodic, resonant, with defects).

Applications to ultrasonic imaging from meter down to sub-micrometer scale.



Topological imaging of industrial structures
(detecting defects where echography is blind)

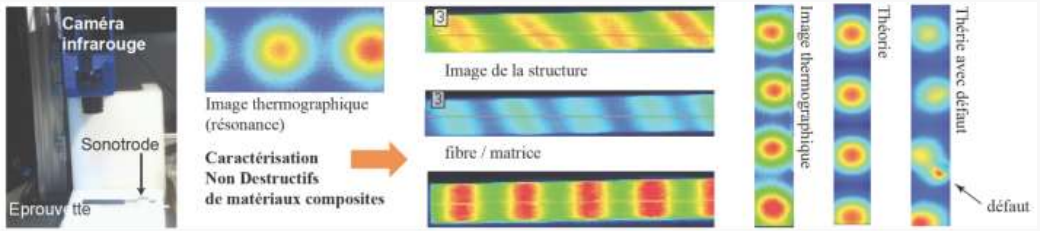
- **3 Groups**
  - Opto-acoustics
  - Functional Materials for Acoustics (Metamaterials)
  - Ultrasounds-Materials



Single cell imaging
(same resolution as optics)

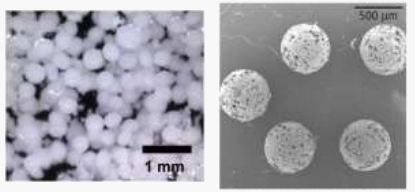
optical image

ultrasonic images

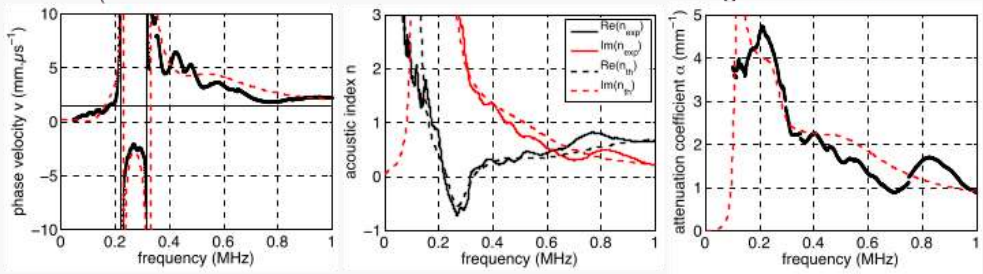


Sonothermography (imaging temperature induced by friction)

In 2015 : Metafluids for ultrasonics (first worldwide realization of a 3D metamaterial with negative acoustic



resonant macroporous-beads suspension



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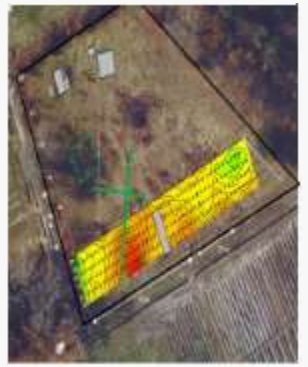
Civil and Environmental Engineering

(Prof. Nadia Saiyouri)

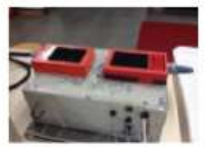
✓ Aim

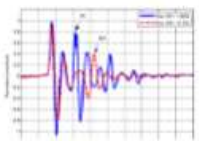
From the building to the site through the construction project or development of materials. For understanding, modeling and predict the behaviour of civil engineering objects (materials, components, structures, sites)

- **3 Groups**
  - Mechanics: Damage and associated phenomena
  - Geosciences: Interactions between soil, underground, water and environment
  - Modeling uncertainty: from measurment to decision with uncertainty, diagnostics, optimisation and reliability

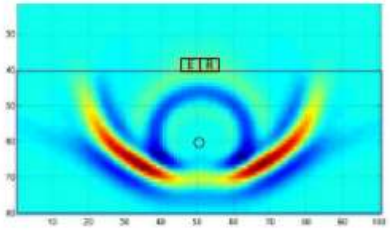


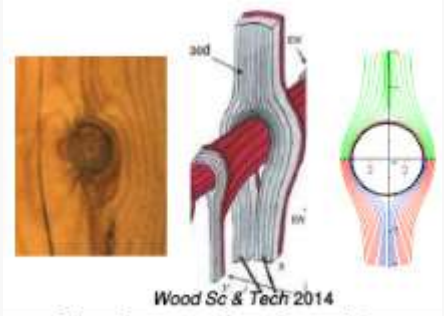
Time evolution of soil humidity



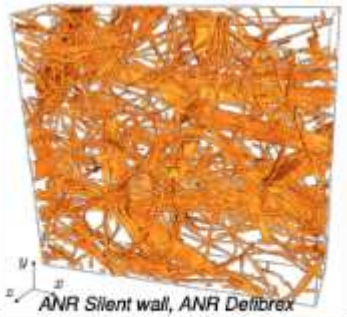


Radar Technique. Evaluation of humidity in concrete and wood





Morphomechanics of tree



Micromechanics of heterogeneous Materials (wood fibers)

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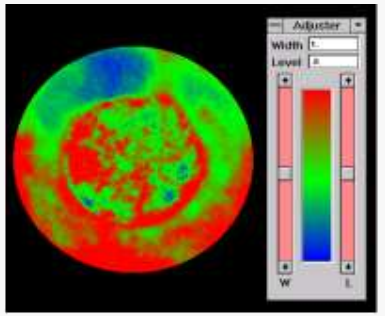
Fluids and Transferts

(Prof. Wahbi Jomaa)

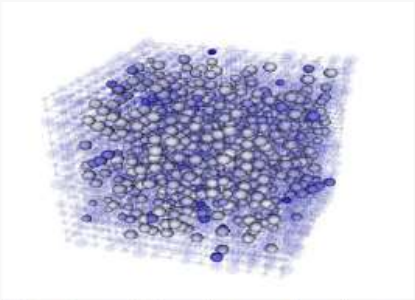
✓ Aim

Modelling Fluid flows and Heat and Mass transfer in heterogeneous media (diphasic flows, porous media, microfluidic devices…), by developping numerial methods, experiments and measurement devices.

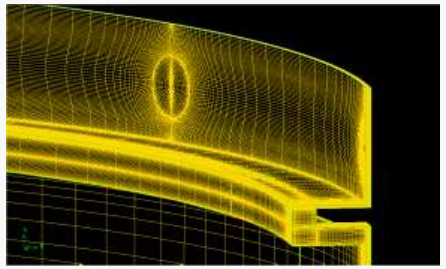
- **3 main topics:**
  - Numerical approaches in Fluid mechanics
  - Porous media
  - Transient heat transfer and characterisation



Saturation field measured by X-ray scanner during foam flow in the heterogeneous porous medium

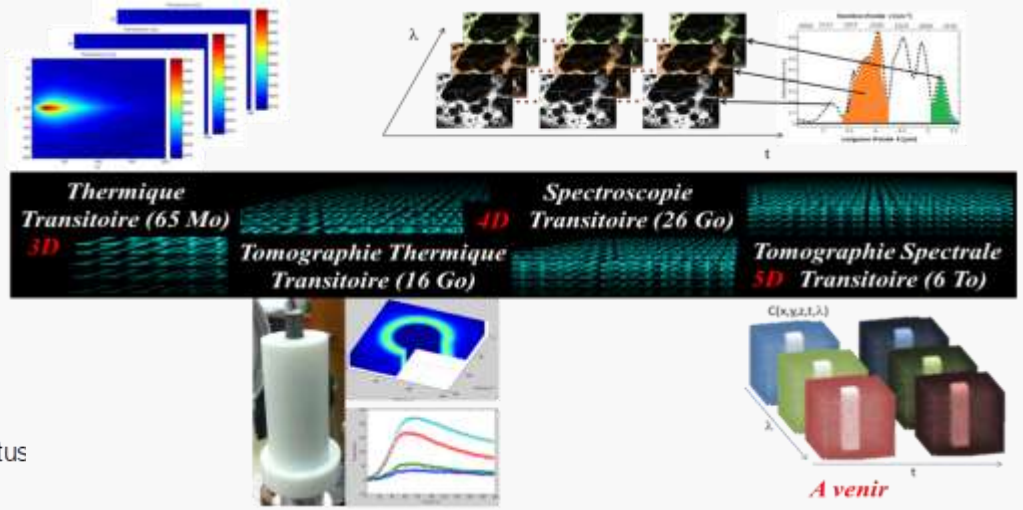


Diphasic capillary viscous flow in a pore network model



Numerical fluid flow

Patented low permeability measurement apparatus



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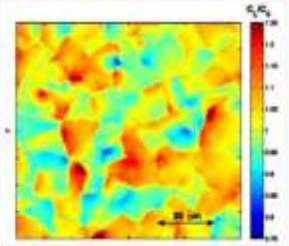
Durability of Materials, Assemblies and Structures

(Prof. Nicolas Saintier)



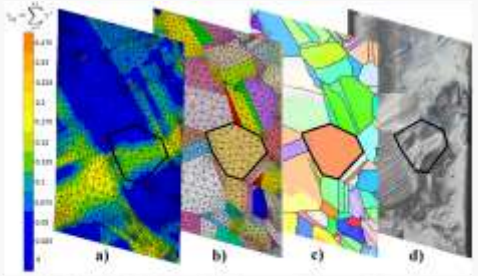
H concentration simuated within polycristals

✓ **Aim**

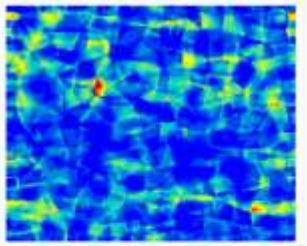
Study the mechanical properties of organic, metallic and composite materials and their evolution under loading and environment, from nano scale to the scale of structures, via micro and macro scales

- **4 Groups**
  - Dynamics
  - Mechanics, Corrosion, Hydrogen
  - Fatigue of Materials and Structures
  - Numerical Mechanics and Heterogeneous Materials

+ **1 Transverse subject**: Development of numerical tools

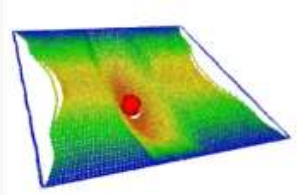


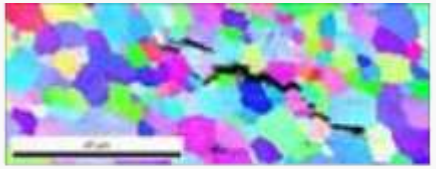
Plasticity within polycristals from experiments to FEA



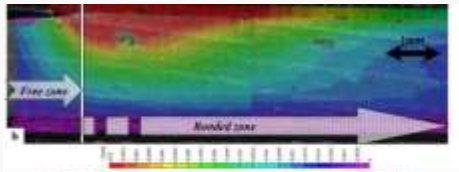
Cumulated plasticity on polycristalline aggregate

DEM simulation of an Impact on 3D interlock (dry fabric)

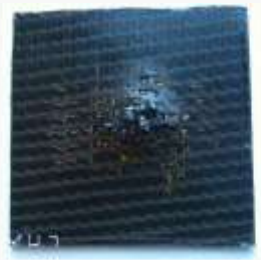




Intergranular cracking under stress corrosion



Vertical displacement field in an thick adhesive joint under cleavage loading



Impact on composite structure

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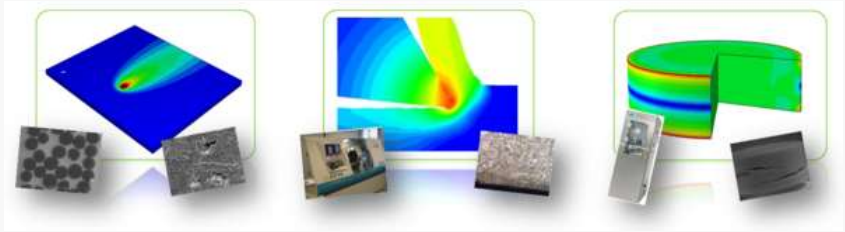
Material, Processes, Interactions

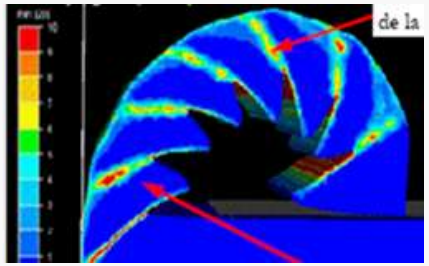
(Prof. Mehdi Chérif)

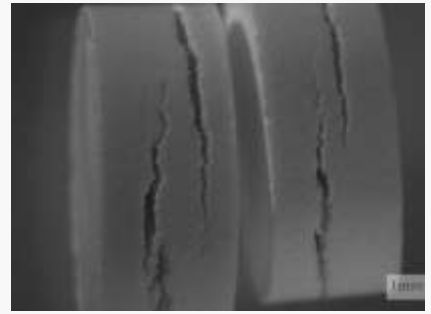
✓ Aim

Understand the physical and physico-chemical mechanisms involved in manufacturing processes based on both experimental (development of testing devices) and numerical (development of process models and simulations) methods.

- **3 Groups**
  - Machining Processes
  - Material implementation processes
  - Galenics – Mechanics of compacted pharmaceutical powders







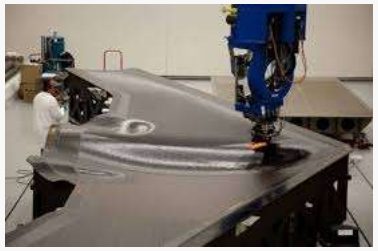
Mechanical Engineering and Design

(Prof. Nicolas Perry)

✓ Aim

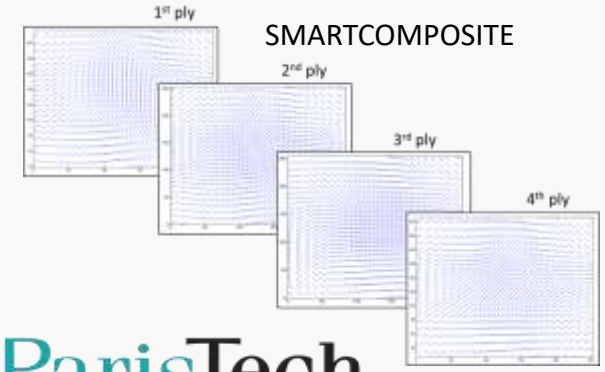
Study Risk reduction in design, Optimisation in design and Robust design

- **3 Groups**
  - Modeling for multiphysics simulation and integrated knowledge
  - Variability analysis and decision assistance in design
  - Studying the material behaviour for designing composite and architectured materials and structures



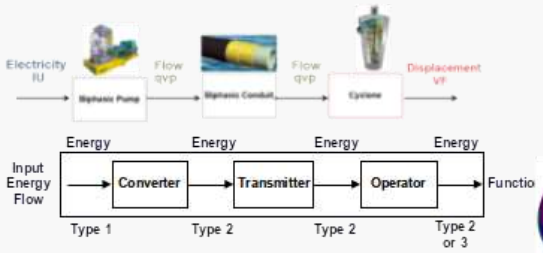
Automated Fiber Placement (AFP)

Design and transfer of innovative TMJ prosthesis

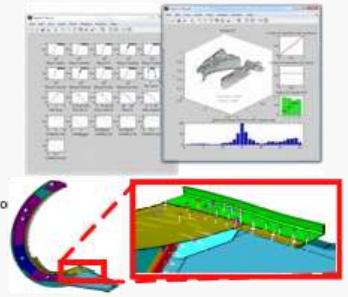


SMARTCOMPOSITE

Design Methodology

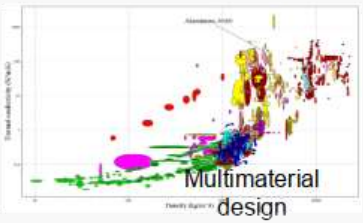


Innovation & Design method based on physical phenomena analysis



Decision making and Robust Design

Tolerancing with real behavior



Multimaterial design

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Laboratoire Conception Produits Innovation

The CPI laboratory works on several lines of research including:
Functional development for Industry 4.0

Dr Khaled Benfriha
Responsible for the new platform 4.0 dedicated to education and scientific research

PHD PROPOSALS – CHIMIE PARISTECH 1/2

No	ParisTech Research field	Subfield	Title	Advisor(s) Name	Advisor(s) Email	Research/Lab group
59	Chemistry, Physical Chemistry and Chemical Engineering	Life and Health Science and Technology	Design and development by continuous flow chemistry of new functionalized peptide nanoobjects for tumor diagnosis and therapy, with quantitative bioimaging monitoring	A. VARENNE, B.-T. DOAN	anne.varenne@chimieparistech.psl.eu; bich-thuy.doan@chimieparistech.psl.eu	SEISAD team, iCLeHS (Chimie ParisTech PSL / CNRS 2027)
60	Chemistry, Physical Chemistry and Chemical Engineering	Organic Chemistry	New iron complexes for enantioselective hydrogen transfer catalysis	Virginie VIDAL, Guillaume LEFEVRE	virginie.vidal@chimieparistech.psl.eu; guillaume.lefevre@chimieparistech.psl.eu	Institute of Chemistry for Life and Health Sciences (i-CLeHS), CSB2D Team
61	Chemistry, Physical Chemistry and Chemical Engineering	Theoretical Chemistry	Development and application of density based indexes for the diagnostic and description of excited states	Ilaria Ciofini, Carlo Adamo	ilaria.ciofini@chimieparistech.psl.eu; carlo.adamo@chimieparistech.psl.eu	Institute of Chemistry for Life and Health Sciences (i-CLeHS), CTM group
62	Chemistry, Physical Chemistry and Chemical Engineering	Chemistry	Better understanding TiO2 photocatalysis by Density Functional Theory approaches	Frédéric Labat	frederic.labat@chimieparistech.psl.eu	Institute of Chemistry for Life and Health Sciences (i-CLeHS), Theoretical Chemistry and Modeling Group
63	Chemistry, Physical Chemistry and Chemical Engineering	Chemistry	2D/3D Perovskites for Stable and High-Efficiency Solar Cells	Thierry PAUPORTÉ	thierry.pauporte@chimieparistech.psl.eu	Institut de Rechreche de ChimieParis (UMR8247)
64	Chemistry, Physical Chemistry and Chemical Engineering	Chemistry	In silico design of unescapable influenza therapies	Aurélie PERRIER	aurelie.perrier@chimieparistech.psl.eu	Institute of Chemistry for Life and Health Sciences (i-CLeHS), CTM group
65	Chemistry, Physical Chemistry and Chemical Engineering	Chemistry	Photocatalysis in Living Cells with Earth Abundant Metals for Cancer Therapy	Gilles GASSER	gilles.gasser@chimieparistech.psl.eu	Institute of Chemistry for Life and Health Sciences (i-CLeHS)
66	Chemistry, Physical Chemistry and Chemical Engineering	Organic Chemistry	Asymmetric Catalysis toward BioRelevant Architecturally Novel Natural and Unnatural Products	Virginie VIDAL	virginie.vidal@chimieparistech.psl.eu	Institute of Chemistry for Life and Health Sciences (i-CLeHS), CSB2D Team
67	Chemistry, Physical Chemistry and Chemical Engineering	Organic Chemistry	Total synthesis of tulearin A and analogues	Phannarath Phansavath	phannarath.phansavath@chimieparistech.psl.eu	Institute of Chemistry for Life & Health Sciences (i-CLeHS), CSB2D team (Catalysis, synthesis of biomolecules and sustainable chemistry)
68	Chemistry, Physical Chemistry and Chemical Engineering		Synthesis of innovative nanomaterials for hydrogen production by water splitting process and the study of its efficiency by the rotating Ring Disk Electrode method.	Abdelhafed Taleb	abdelhafed.taleb@chimieparistech.psl.eu	IRCP-UMR 8247
69	Chemistry, Physical Chemistry and Chemical Engineering		Design of new electrode materials based on nanoparticles for electrochemical nanosensing applications with environmental interest.	Abdelhafed Taleb	abdelhafed.taleb@chimieparistech.psl.eu	IRCP-UMR 8247

PHD PROPOSALS – CHIMIE PARISTECH 2/2

No	ParisTech Research field	Subfield	Title	Advisor(s) Name	Advisor(s) Email	Research/Lab group
70	Chemistry, Physical Chemistry and Chemical Engineering | Life Science and Engineering for Agriculture, Food and the Environment	Electrochemistry, Bio analytical chemistry	Hydrogel Matrix Grafted electrochemical Aptasensors for the Detection of emerging pollutants	Cyrine Slim, Sophie Griveau, Fethi Bedioui	Cyrine.slim@chimieparistech.psl.eu; sophie.griveau@chimieparistech.psl.eu	Institute of Chemistry for Life and Health Sciences (i-CLeHS)
71	Chemistry, Physical Chemistry and Chemical Engineering	Chemistry and Materials Science	Synthesis of Biobased Polyurethanes from Renewable Resources: A New Tandem Approach to Polypeptide Analogues	Christophe Thomas	christophe.thomas@chimieparistech.psl.eu	Organometallic Chemistry and Polymerization Catalysis
72	Chemistry, Physical Chemistry and Chemical Engineering	Chemistry	Smart multi-catalytic systems for the production of biocompatible polymers	Régis Gauvin, Christophe Thomas	regis.gauvin@chimieparistech.psl.eu; christophe.thomas@chimieparistech.psl.eu	Organometallic Chemistry and Polymerization Catalysis
73	Chemistry, Physical Chemistry and Chemical Engineering	Chemistry and Materials Science	Synthesis of Biodegradable Polymers from Renewable Resources	Régis Gauvin, Christophe Thomas	regis.gauvin@chimieparistech.psl.eu; christophe.thomas@chimieparistech.psl.eu	Organometallic Chemistry and Polymerization Catalysis
74	Chemistry, Physical Chemistry and Chemical Engineering	Chemistry and Materials Science	Vectorizing nanoparticles using biocompatible and biodegradable polymer coating mediated by surface organometallic chemistry	Régis Gauvin, Christophe Thomas	regis.gauvin@chimieparistech.psl.eu; christophe.thomas@chimieparistech.psl.eu	Organometallic Chemistry and Polymerization Catalysis
75	Chemistry, Physical Chemistry and Chemical Engineering	Surface Science, Molecular Modeling	Organic molecules for the corrosion inhibition of Al alloys: theoretical and experimental model approach	Dominique COSTA (Dimitri Mercier, Sandrine Zanna, Philippe Marcus co-advisors)	dominique.costa@chimieparistech.psl.eu	PSC/IRCP
76	Chemistry, Physical Chemistry and Chemical Engineering	Chemistry	Development of new iodine(III) compounds for antibiotic applications	Kevin Cariou	kevin.cariou@chimieparistech.psl.eu	Institute of Chemistry for Life and Health Sciences (i-CLeHS)
77	Chemistry, Physical Chemistry and Chemical Engineering	Analytical and Physical Chemistry, Materials	In situ analytical approaches to understand environmental stability of materials for energy	Polina VOLOVITCH	polina.volovitch@chimieparistech.psl.eu	IRCP or IPVF

I-CLEHS LABORATORY: SEISAD TEAM

KEY THEMATICS

Synthesis of functionalized (bio)molecules using microwaves, plasma gas & continuous flow in liquid milli- and micro-reactors

Analytical electrochemistry, biosensors

Synthesis and physico-chemical characterization of nanoplatforms for theranostic

Lab-on-a-chip (mTAS)

Imaging and diagnosis

2 PHD PROPOSALS FOR THE PARISTECH – CSC PHD PROGRAM

PhD proposal 59 **DESIGN OF NEW FUNCTIONALIZED PEPTIDE NANO-OBJECTS FOR TUMOR DIAGNOSIS AND THERAPY, WITH QUANTITATIVE BIOIMAGING MONITORING**

A. Varenne, BT. Doan
C. Lescot, F. D'Orlyé, L. Trapiella

PhD proposal 70 **HYDROGEL MATRIX GRAFTED ELECTROCHEMICAL APATSENSORS FOR THE DETECTION OF EMERGING POLLUTANTS**

C. Slim, S. Griveau, F. Bedioui

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PhD proposal 59: DESIGN OF NEW FUNCTIONALIZED PEPTIDE NANO-OBJECTS FOR TUMOR DIAGNOSIS AND THERAPY, WITH QUANTITATIVE BIOIMAGING MONITORING

NANOMEDECINE

Cure (THERAPEUTIC)

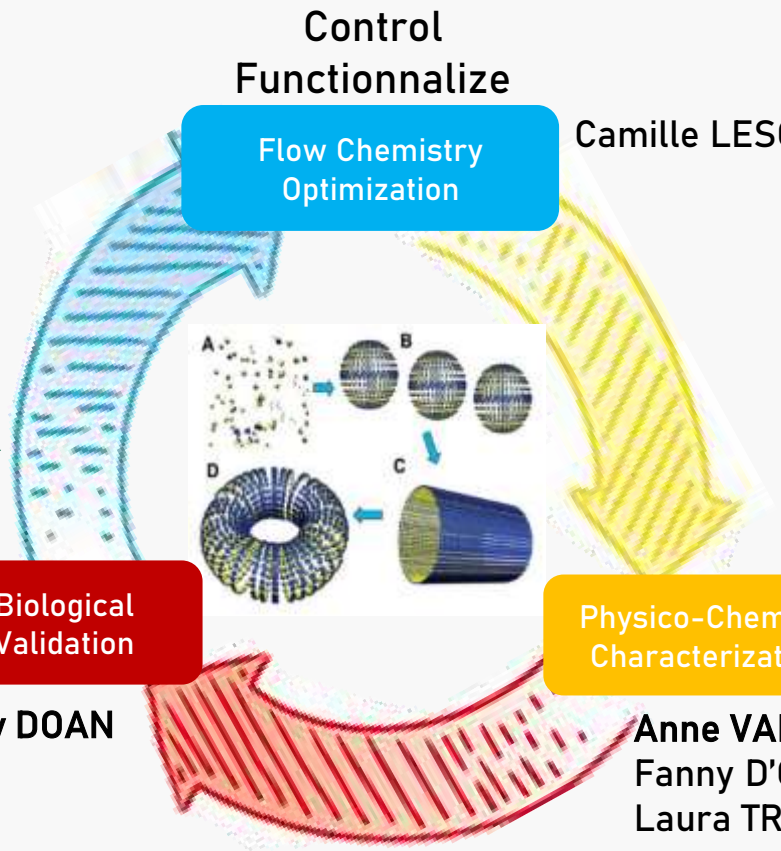
+

Image & define (DIAGNOSTIC)

=

NANO-OBJECTS FOR THERANOSTIC

Create an innovative nanovector made of peptides



Current limitations:

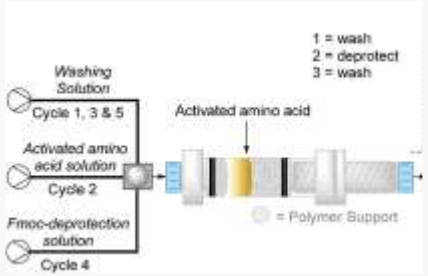
→ *Toxicity*

→ *Bioaccumulation*

→ *Lack of stability*

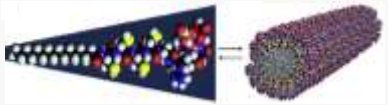
INSTITUT OF CHEMISTRY FOR LIFE AND HEALTH SCIENCES

Precise control of the nanovector synthesis through flow chemistry optimisation



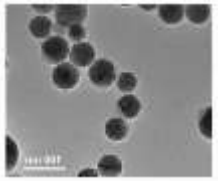
Natural building blocks

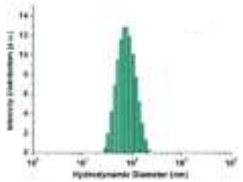
Self-Assembly in tunable nanostructures



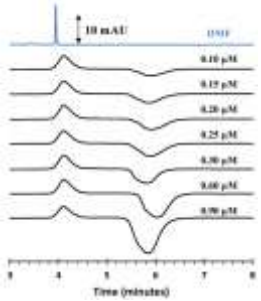
Functionalisation
of the peptides : Targeting and labelling

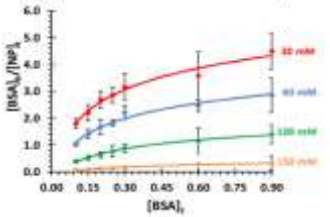
Thorough characterization of the nano-object *to predict its biological interest*





Morphological and elemental analysis: *TEM-EDS*
Surface charge, hydrodynamic size and size distribution analysis: *Zetametry and DLS*

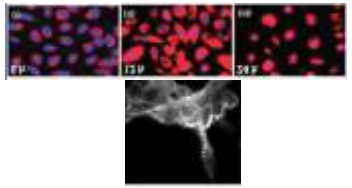




Structural, stability and purity analysis: CZE-ESI-MS
Specific and non-specific interaction analysis:
Capillary electrophoretic affinity assay

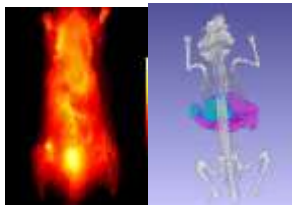
Biological Validation *Quantitative evaluation of targeting*

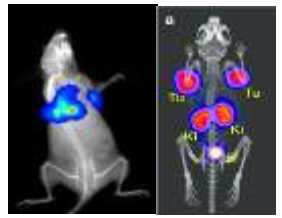
In vitro assays



Cytotoxicity
Biomiaging properties
Cellular interactions

In vivo assays





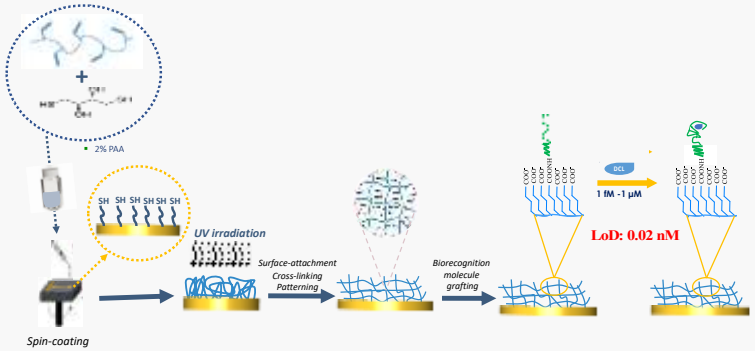
Biodistrib ution
Clearance
Therapeutic efficiency

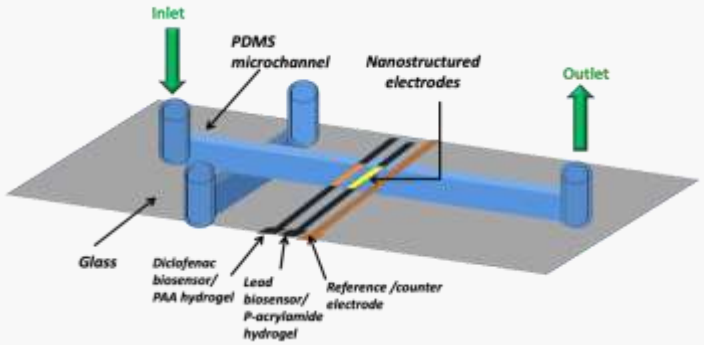


PhD proposal 70: HYDROGEL MATRIX GRAFTED ELECTROCHEMICAL APTASENSORS FOR THE DETECTION OF EMERGING POLLUTANTS

→ Developing new surface-fixed biocompatible hydrogel-based immobilization matrix to improve the performance of biosensors

→ Multiplexed detection of different emergent pollutants families in water : high selectivity and very low detection limit)





Objective : to design portable and innovative electrochemical aptasensors to simultaneously detect inorganic and organic priority and emerging water

G. S. KASSAHUN, S. GRIVEAU, S. JUILLARD, J. CHAMPAVERT, A. RINGUEDE, B. BRESSON, Y. TRAN, F. BEDIOUI, C. SLIM. Hydrogel Matrix Grafted Impedimetric Aptasensor for the Detection of Diclofenac. Langmuir 36 (2020) 827)836



SCIENTIFIC CONSORTIUM

Partner 1

Institute of Chemistry for life and health sciences (iCLeHS)
UMR 8060
CHIMIE PARISTECH

Analytical electrochemistry
sensors

Cyrine Slim (MC)
Sophie Griveau (MC)
Fethi Bedioui (DR CNRS)

Partner 2

Physico-chemistry of Polymers and Dispersed Media
UMR 7615
ESPCI PARIS

Smart polymers
Physico-chemistry and interfaces

Yvette Tran (MC)
Bruno Bresson (IR)

CSC PhD candidates

ParisTech
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PHD PROPOSALS – ECOLE DES PONTS PARISTECH

No	ParisTech Research field	Subfield	Title	Advisor(s) Name	Advisor(s) Email	Research/Lab group
78	Environment Science and Technology, Sustainable Development, Geosciences	Applied Physics	Spatio-temporal variability of rainfall drop size distribution across scales: retrieval, characterization and uses	Auguste Gires / Ioulia Tchiguirinskai	Auguste.Gires@enpc.fr / ioulia.tchiguirinskaia@enpc.fr	HM&Co
79	Mathematics and their applications	Applied Physics, Geosciences, Data Science, Environment Science and Technology	Multiscale short-term forecasts of geophysical fields based on remotely-sensed big data	Daniel Schertzer / Ioulia Tchiguirinskai	Daniel.Schertzer@enpc.fr / ioulia.tchiguirinskaia@enpc.fr	HM&Co
80	Environment Science and Technology, Sustainable Development, Geosciences	Hydrology	Optimal implementation of Nature-Based Solutions to mitigate Urban Heat Islands	Pierre-Antoine Versini	pierre-antoine.versini@enpc.fr	HM&Co
81	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	pierre-antoine.versini@enpc.fr	HM&Co
82	Mathematics and their applications	Applied mathematics (scientific computing), Computational mechanics (hydraulics)	Modelling and simulating complex flows for engineering puposes	Sébastien BOYAVAL	sebastien.boyaval@enpc.fr	Laboratoire d'Hydraulique Saint-Venant (LHSV)
83	Information and Communication Sciences and Technologies	Smart Cities, Artificial intelligence, Environment	Artificial intelligence and the Internet of Things to monitor and accommodate with urban pollution in smart cities	Françoise Lucas (Leesu, ENPC), Co-advisor: Sami Souihi (LiSSi, University Paris-Est Créteil)	francoise.lucas@enpc.fr; sami.souihi@u-pec.fr	Leesu (ENPC and University Paris-Est Créteil), LISA and LiSSi (University Paris-Est Créteil)

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ECOLE DES PONTS PARISTECH

Research strategy: a successful ecological and energy transition

Interdisciplinary research aiming at tackling four socio-economic challenges: City and mobility systems / Management of risks, resources, and milieus / Industry of the future / Economy, practices, and society

Focus on the lab suggesting PhD proposals :

Hydrology Meteorology and Complexity (HM&Co) laboratory	Multiscale weather observations and forecasts Multiscale hydrological modelling Monitoring of nature based solutions
Saint-Venant Hydraulics Laboratory	Fluvial & Coastal hydraulics Sediments and contaminants transported by natural water Operational numerical models & experimental facilities
LEESU- Urban water quality and management	Innovation in water and city management Functioning, resilience and adaptation of management systems Ecosystems and natural water ressources

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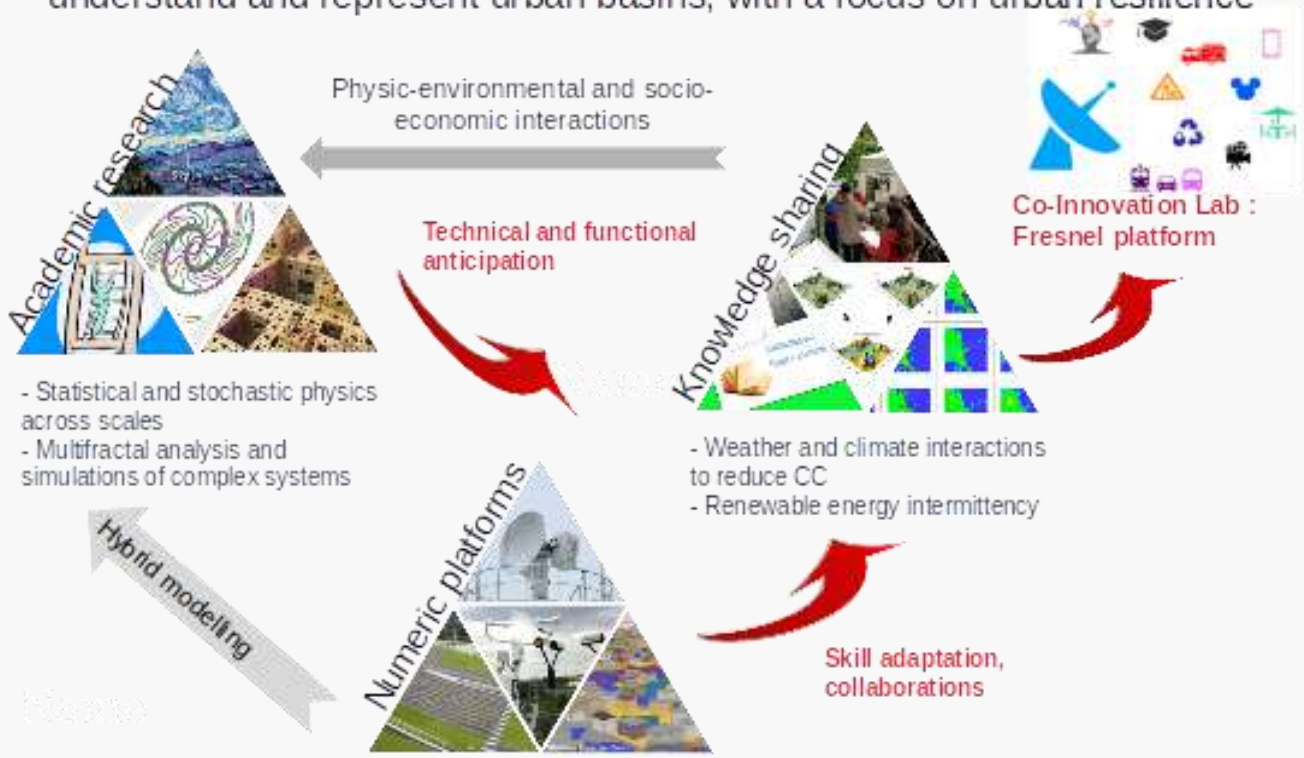
HYDROLOGY METEOROLOGY AND COMPLEXITY LABORATORY

HM&C
HYDROLOGY METEOROLOGY and COMPLEXITY

RESEARCH INFRASTRUCTURES

HM&Co develops multi-scale analysis, multi-scale observations and complex systems approach to modelling. Our research aims to better understand and represent urban basins, with a focus on urban resilience



KEY RESEARCHERS

2017 Fall Meeting Honors Tribute Show

Daniel Schertzer : EGU Lewis Fry Richardson medallist

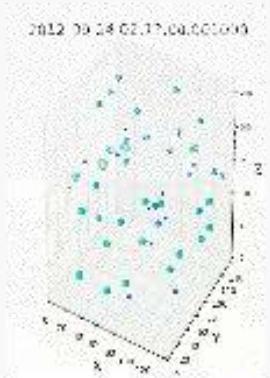
Pierre-Antoine Versini

Auguste Gires

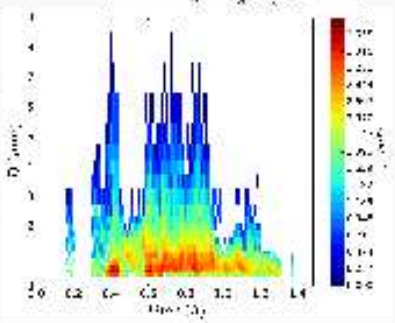
PhD Proposal 78: Spatio-temporal variability of rainfall drop size distribution (DSD) across scales: retrieval, characterization and uses

Weather radars : the only device providing spatio-temporal insight

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



DSD maps

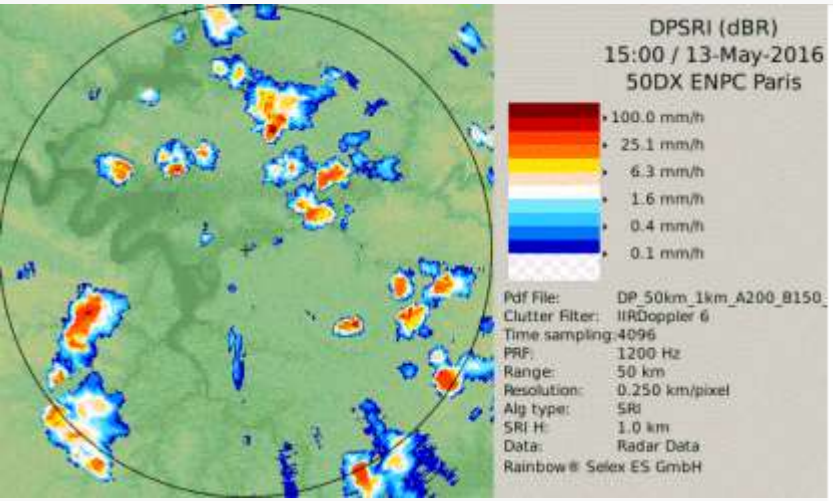


Improvement of rainfall retrieval algorithms

Quantification of DSD spatio-temporal variability (Multifractal framework)

Existing knowledge in time

PHD PROPOSAL 79: MULTISCALE SHORT-TERM FORECASTS OF GEOPHYSICAL FIELDS BASED ON REMOTELY-SENSED BIG DATA



✓**Complex systems: strongly nonlinear, out of the framework of classical methodologies**

✓**Extreme variability of geophysical fields, wide range of scales**

✓**Disruptive methodologies are indispensable**

✓

Le Monde.fr

« ...it is extremely local and hard to predict »

Marc Hay

✓**YOU ARE THE ONE TO SUCCEED DOING THIS !**

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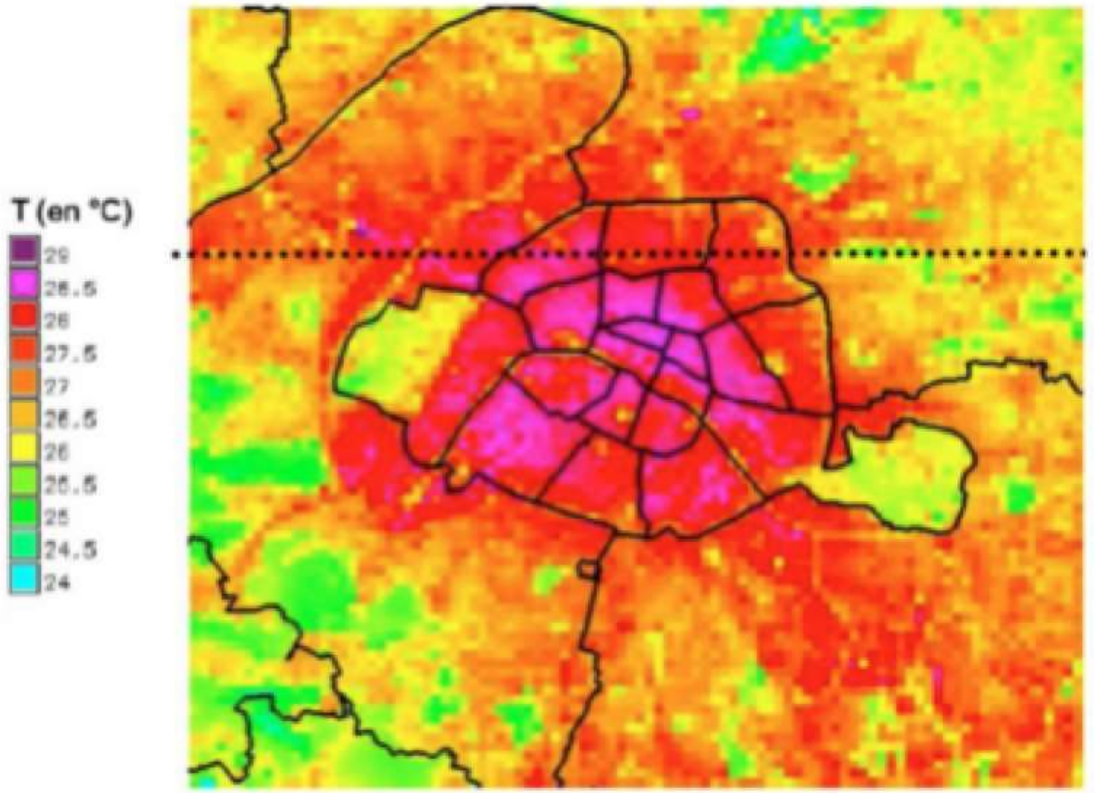
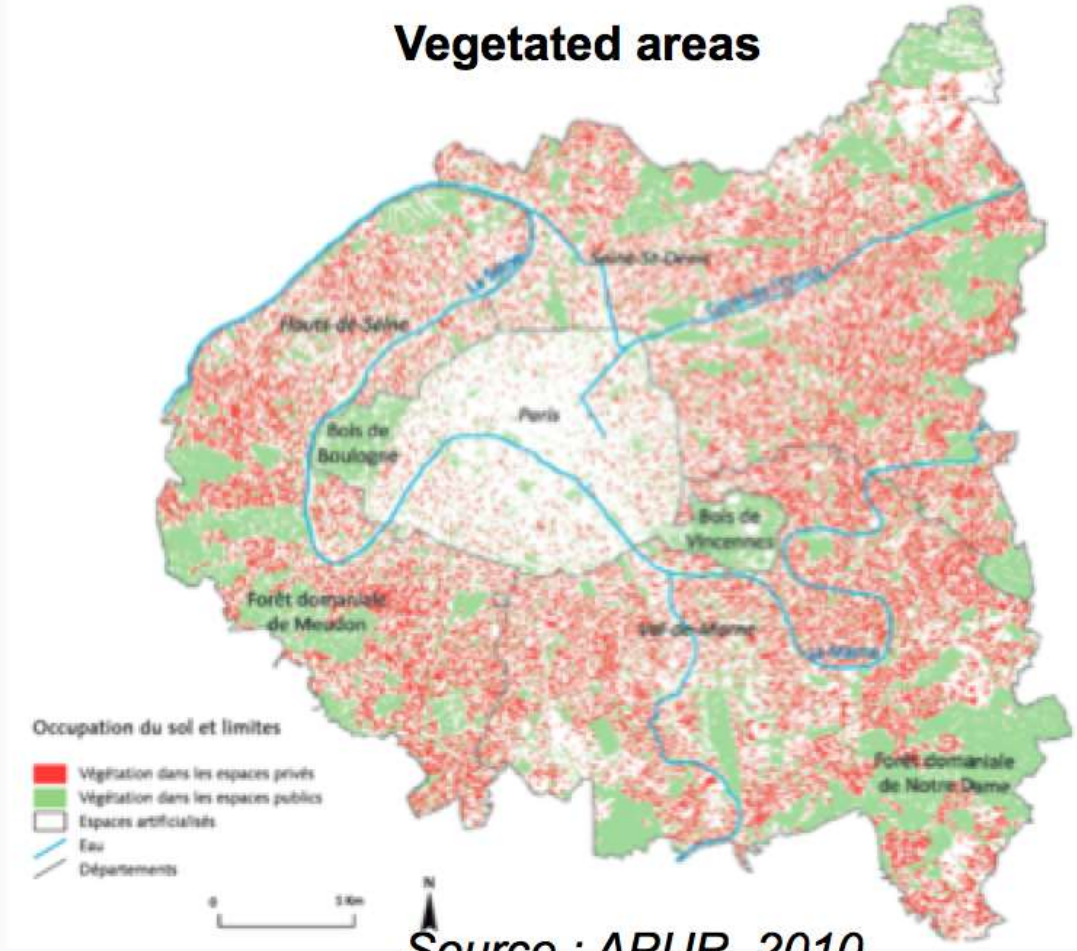
PhD Proposal 80: Optimal implementation of Nature-Based Solutions to mitigate Urban Heat Islands

Urban Heat Island



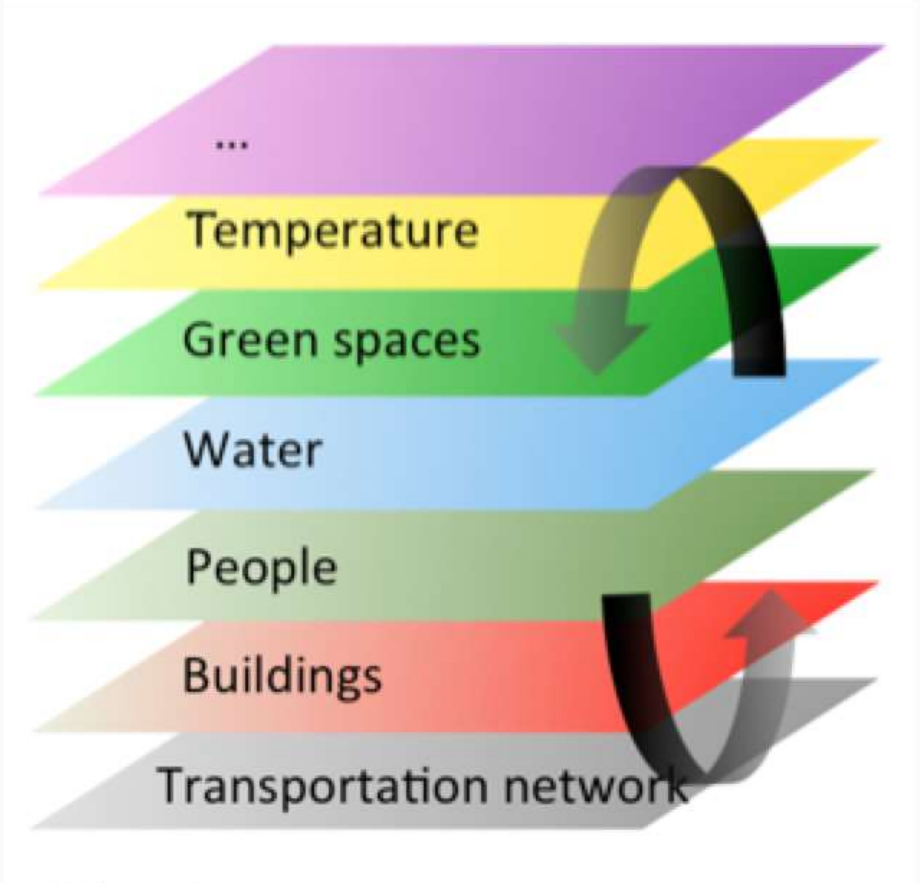
Source: Meteo France

Vegetated areas



Source : APUR, 2010

PhD Proposal 81: **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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SAINT-VENANT HYDRAULICS LABORATORY

LABORATOIRE D'HYDRAULIQUE SAINT-VENANT

RESEARCH INFRASTRUCTURES
EDF'Lab CHATOU

ST-VENANT HYDRAULICS LAB
(EDF-ENPC-CEREMA)

IS BASED IN
EDF R&D CAMPUS
EDF'LAB CHATOU

(15MN-TRAIN WEST PARIS)

RESEARCHERS
ECOLE DES PONTS PARISTECH

SÉBASTIEN BOYAVAL

ST-VENANT HYDRAULICS LAB.
(EDF – ENPC – CEREMA)

& MATHERIALS (INRIA PARIS)

RÉMI CARMIGNIANI

ST-VENANT HYDRAULICS LAB.
(EDF – ENPC – CEREMA)

& SCIENCES 2024

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LABORATOIRE EAU, ENVIRONNEMENT & SYSTÈMES URBAINS

leesu
laboratoire eau environnement systemes urbains

RESEARCH INFRASTRUCTURES
House for Environmental Sciences

LEESU- LISA- OSU EFLUVE
PRAMMICS PLATFORM

IS BASED IN
UPEC Campus
(20 MN-METRORAIL EAST PARIS)

RESEARCHERS
ECOLE DES PONTS PARISTECH

FRANÇOISE LUCAS

LEESU
(ENPC - UNIVERSITY PARIS-EST CRÉTEIL)

DIRECTOR REGIS MOILLERON

70 PERSONS

- *Researchers & Professors*
- *Post-Docs*
- *Engineers*
- *Technicians & Secretaries*
- *PhD candidates*

Number of publications
34 in 2019

COLLABORATIONS FOR THE THESIS

GILLES FORET-
LISA- UPEC

SAMI SOUIHI &
THIAGO ABREU
- LISSI- UPEC

PHD PROPOSALS – ESPCI PARIS – PSL 1/2

No	ParisTech Research field	Subfield	Title	Advisor(s) Name	Advisor(s) Email	Research/Lab group
84	Life and Health Science and Technology	Neurosciences, Neuropathology	Propagation of neurodegeneration in parkinson's disease studied in drosophila models	Serge Birman	serge.birman@espci.psl.eu	Genes Circuits Rhythms and Neuropathology (GCRN group) /Brain Plasticity Laboratory
85	Energy, Processes	Materials for photovoltaics	Material Strategies for More Stable Perovskite Solar Cells	Zhuoying Chen	zhuoying.chen@espci.fr	Micro & Nano Characterization Group/LPEM
86	Materials Science, Mechanics, Fluids	Applied Physics-Chemistry	Electrostrictive and Triboelectric fibers for Vibrational Energy Harvesting	Annie COLIN	annie.colin@espci.fr	MIE CBI
87	Physics, Optics	Soft Matter	Characterization of the flow of concentrated suspensions under vibrations	Annie COLIN	annie.colin@espci.fr	MIE CBI
88	Physics, Optics	Chemistry, Colloidal Sciences	Active Colloidal Gels	Olivier Dauchot	olivier.dauchot@espci.fr	Gulliver Lab
89	Physics, Optics	Mech. Eng / Computer Science	Morphological Swarm Robotics	Olivier Dauchot	olivier.dauchot@espci.fr	Gulliver Lab
90	Materials Science, Mechanics, Fluids	Applied Physics and electrical engineering	Contact effects at metal/insulator interfaces	Stéphane Holé	stephane.hole@espci.fr	Physics and Material Study (LPEM)
91	Materials Science, Mechanics, Fluids	Applied Physics and electrical engineering	High spatial resolution space charge distribution measurement by electro-acoustic reflectometry (EAR)	Stéphane Holé	stephane.hole@espci.fr	Physics and Material Study (LPEM)
92	Physics, Optics | Materials Science, Mechanics, Fluids	Applied Physics, Acoustics	Acoustic imaging and pumping in granular sediments	Xiaoping JIA	xiaoping.jia@espci.fr	Institut Langevin
93	Physics, Optics	Condensed Matter	Local electronic properties of a remarkable ionic conductor	Guillaume LANG, Brigitte LERIDON	guillaume.lang@espci.fr; brigitte.leridon @espci.fr	LPEM
94	Mathematics and their applications	Statistical mechanics, statistics, applied mathematics)	Irreversible algorithms for molecular modeling	Anthony Maggs	anthony.maggs@espci.fr	Gulliver Lab
95	Chemistry, Physical Chemistry and Chemical Engineering	Material sciences, mechanics, fluids	Bio inspired hydrogels for water filtration	Cecile Monteux	cecile.monteux@espci.fr	SIMM, Soft Matter Science and Engineering

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PHD PROPOSALS – ESPCI PARIS – PSL 2/2

No	ParisTech Research field	Subfield	Title	Advisor(s) Name	Advisor(s) Email	Research/Lab group
96	Biology, Biophysics and Bio Chemistry	Biophysics, Soft-Matter, Synthetic Biology, Chemistry, Applied Physics	A microfluidic reactor for the emergence, assembly and evolution of life's biopolymers and cellular structures	Philippe Nghe, Tommaso Fraccia	philippe.nghe@espci.psl.eu; tommaso.fraccia@espci.fr	Laboratoire de Biochimie / CBI
97	Life and Health Science and Technology | Physics, Optics	High resolution eye imaging	Imaging and dynamic of the retina cells	Olivier Thouvenin, Pedro Mece, Claude Boccara	olivier.thouvenin@espci.fr; pedro.mece@espci.fr; claude.boccara@espci.fr	Institut Langevin
98	Physics, Optics	Applied Physics	Nanostructures fabrication and characterization for implementation in optoelectronic devices	Lionel Aigouy, Zhuoying Chen	lionel.aigouy@espci.fr; zhuoying.chen@espci.fr	MNC Group / LPEM
99	Physics, Optics	Hydrodynamics	Micro-helices in flows	Anke Lindner and Olivia du Roure	anke.lindner@espci.fr; Olivia.duroure@espci.fr	Complex Suspensions/PMMH
100	Materials Science, Mechanics, Fluids	Polymer materials and chemistry, Mechanics, Material science	Cutting soft materials	Matteo Ciccotti, Frederic Lechenault	matteo.ciccotti@espci.fr; frederic.lechenault@lps.ens.fr	Soft Matter Science and Engineering Laboratory
101	Materials Science, Mechanics, Fluids	Polymer materials and chemistry, Mechanics, Material science	Bridging Chemistry, Physics and Mechanics: Understanding how needles and blades damage chemical bonds in soft materials	Tetsuharu Narita, Costantino Creton, Matteo Ciccotti	tetsuharu.narita@espci.fr; costantino.creton@espci.fr; matteo.ciccotti@espci.fr	Soft Matter Science and Engineering Laboratory
102	Materials Science, Mechanics, Fluids	Physics, Applied Physics	Electronic and Thermoelectrical properties of dilute metals	Benoît Fauqué, Kamran Behnia	benoit.fauque@espci.fr; kamran.behnia@espci.fr	LPEM
103	Materials Science, Mechanics, Fluids	Physics, Applied Physics	Bad metals and soft mode in the quantum paralectrics	Benoît Fauqué, Philippe Bourges	benoit.fauqué@espci.fr; philippe.bourges@cea.fr	LPEM, LLB

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ESPCI PARIS | PSL

GULLIVER LAB

UMR 7083 Gulliver

UMR 7083 Gulliver

EXPERIMENTAL AND THEORETICAL TRAVELS IN SOFT MATTER

Research domains: Soft Matter, Programmable Matter, Active Matter, Topological Matter, Theory and Experiments
Experimental systems : Microfluidics, Interfaces, Colloids, Liquid Crystals, Swarm Robotics, Molecular systems

Programmable Matter

Yannick Rondelez  Zorana Zeravcic  Matthieu Labousse 

Active Matter

Olivier Dauchot  Teresa Lopez-Leon 

Topological Matter

Teresa Lopez-Leon  Vincent Démery 

Interfacial Soft Matter

Joshua McGraw  Élie Raphaël  Mathilde Reyssat 

Theory in Soft Matter

Anthony Maggs  Michael Schindler  Ludwik Leibler 

David Lacoste  Ken Sekimoto 

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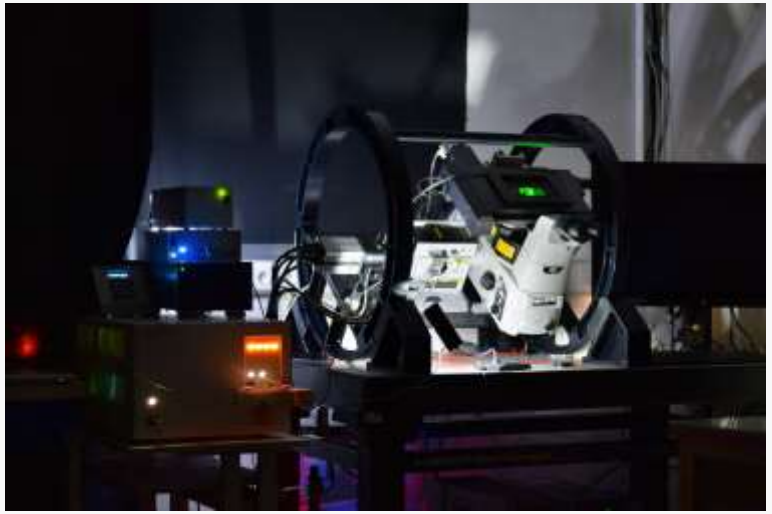
RESEARCH INFRASTRUCTURES



OPTICAL MICROSCOPY
CONFOCAL
TIRF
EPIFLUO
STED

3D PRINTING
STRATASYS
NANOSCRIBE

MICROFLUIDIC
IPGG PLATFORM

Name

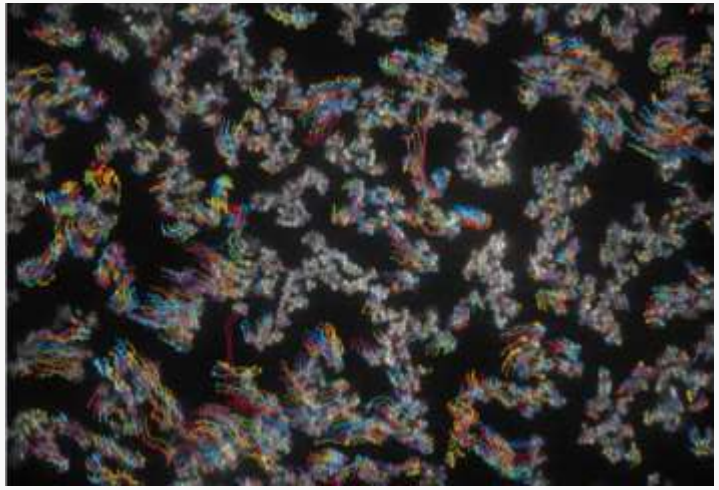
KEY FACTS / FIGURES

40 members/ 16 teacher-researchers
16 PhD candidates / 8 post-docs

More than 50 publications per year

Up to 10 patents

Feel Well at Gulliver
A great balance of gender
More than 10 nationalities



ACTIVE GELS : Colloidal Active Gels are obtained from the aggregation of passive and light activated colloids.

GOAL : Study the coupling between the activity level and the mechanical properties of the gel.

REFS : J. Chem. Phys. **151**, 114901 (2019)
Phys. Rev. Lett. **123**, 098001 (2019)

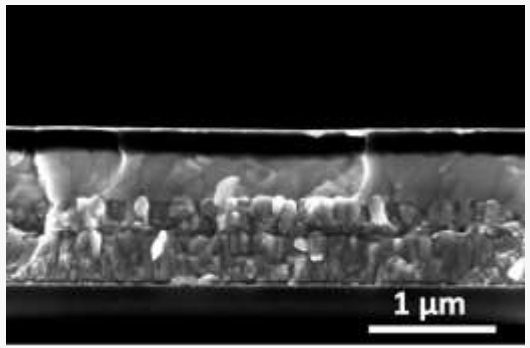
MORPHO SWARM ROBOTICS : Robots collectively learn what they can leveragfe from their physical morphology to achieve a task

GOAL : Design new algorithms for swarm robotics bridging the reality gap.

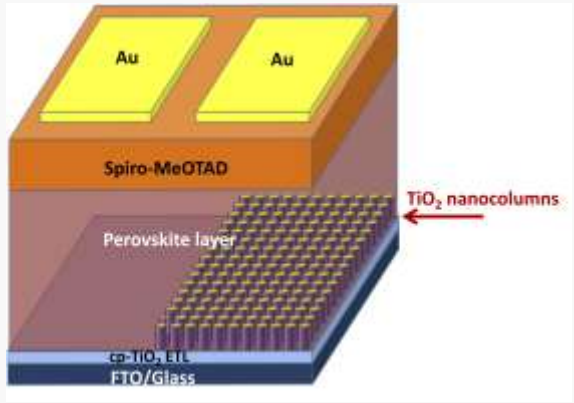
REFS : Proceedings of the IEEE Congress on Evolutionary Computation (CEC), 2020
Phys. Rev. Lett. **122,** 068002 (2019).

LPEM (Laboratoire de Physique et d'Etude des Matériaux)

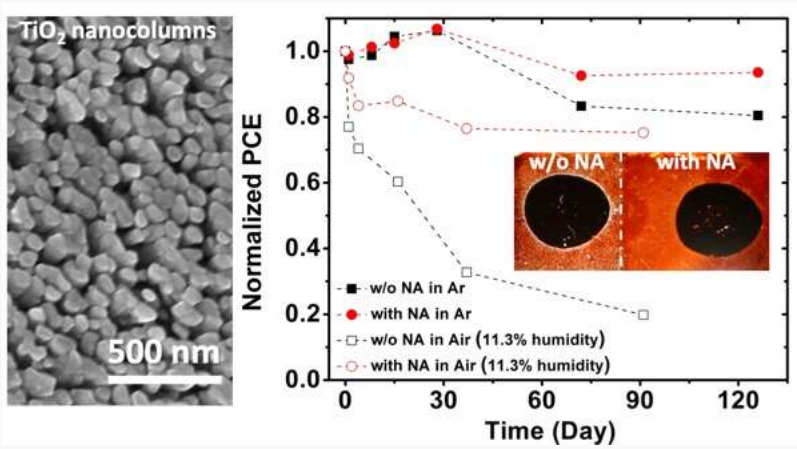
Micro & Nano Characterization Group



Cross-section SEM (perovskite solar cells)



Nanostructures: e.g. TiO_2 nanocolumns



Solar cell stability

Key researchers at MNC Group

Lionel Aigouy

Zhuoying Chen

More information:
http://optoelec.lpem.espci.fr
https://www.espci.psl.eu/recherche/labos/lpem/mnc/index.html

Name

ParisTech
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PHD PROPOSALS – INSTITUT D'OPTIQUE GRADUATE SCHOOL

No	ParisTech Research field	Subfield	Title	Advisor(s) Name	Advisor(s) Email	Research/Lab group
104	Physics, Optics	Applied Physics	Highly sensitive sensors for detection of pollutants based on optical nanofibers	LEBRUN Sylvie	sylvie.lebrun@institutoptique.fr	Nonlinear Photonics - LCF
105	Physics, Optics	Nanophotonics	Exploring the optical properties of perovskite single nanocrystals and superlattices	Brahim LOUNIS/ Philippe TAMARAT	brahim.lounis@u-bordeaux.fr	Nanophotonics - LP2N
106	Physics, Optics	Quantum Optics	Coherent dipole-dipole coupling of organic molecules at cryogenic temperatures	Brahim LOUNIS/ Jean-Baptiste TREBBIA	brahim.lounis@u-bordeaux.fr	Nanophotonics - LP2N
107	Physics, Optics	Superconductivity and magnetism, Josephson transport	Fast Josephson-junction control by optical manipulation of a flux quantum	Brahim LOUNIS/ Philippe TAMARAT	brahim.lounis@u-bordeaux.fr	Nanophotonics - LP2N
108	Physics, Optics	Quantum physics, molecular physics, condensed matter	Towards single spin control with an optically driven Abrikosov vortex	Brahim LOUNIS/ Philippe TAMARAT	brahim.lounis@u-bordeaux.fr	Nanophotonics - LP2N
109	Physics, Optics	Mechanical Engineering, Energ	Controlling thermal emission	Jean-Jacques GREFFET	jean-jacques.greffet@institutoptique.fr	Plasmonics/LCF

PHD PROPOSALS – MINES PARISTECH – PSL

No	ParisTech Research field	Subfield	Title	Advisor(s) Name	Advisor(s) Email	Research/Lab group
110	Materials Science, Mechanics, Fluids	Bio-based polymers, Biomaterials, Aerogels, Fluid mechanics	3D printing of gels and aerogels for biomedical applications	Tatiana BUDTOVA, Co-advisors: Sijtze BUWALDA, Rudy VALETTE	Tatiana.budtova@mines-paristech.fr	Centre for Materials Forming
111	Energy, Processes	Electrical engineering, applied mathematics, smart grid	Big data based forecasts for the electric power system	Andrea Michiorri	andrea.michiorri@mines-paristech.fr	PERSEE
112	Energy, Processes	Electrical engineering, applied mathematics, smart grid	Dynamic Line Rating: risk and impact on investment planning	Andrea Michiorri	andrea.michiorri@mines-paristech.fr	PERSEE
113	Economics, Management and Social Sciences	Logistics and Supply Chain and Management	Performance of interconnected logistics networks under uncertainty	Eric BALLOT, Shenle PAN	eric.ballot@mines-paristech.fr; shenle.pan@mines-paristech.fr	Centre de gestion Scientitique
114	Materials Science, Mechanics, Fluids	Mechanics of materials, physical metallurgy	A Self consistent crystal plasticity model coupled to a mean field model for microstructural evolution predictions	François Bay, Daniel Pino Muñoz, Charbel Moussa	francois.bay@mines-paristech.fr; daniel.pino_munoz@mines-paristech.fr; charbel.moussa@mines-paristech.fr	Centre de mise En Forme des matériaux (CEMEF)
115	Information and Communication Sciences and Technologies	Computer Science	Scaling Up Polarized Deduction Modulo Theory	Olivier Hermant	olivier.hermant@mines-paristech.fr	Centre de recherche en informatique
116	Materials Science, Mechanics, Fluids	Applied Physics, Structure Design, Organic & hybrids Materials	Digital Crystallization of Organic-based systems: from Spherulites to Dendrites	Charles-André GANDIN, Patrice LAURE, Séverine A.E. BOYER	Charles-Andre.Gandin@mines-paristech.fr, Patrice.Laure@mines-paristech.fr, Severine.Boyer@mines-paristech.fr	CEMEF CNRS 7635, MINES ParisTech PSL

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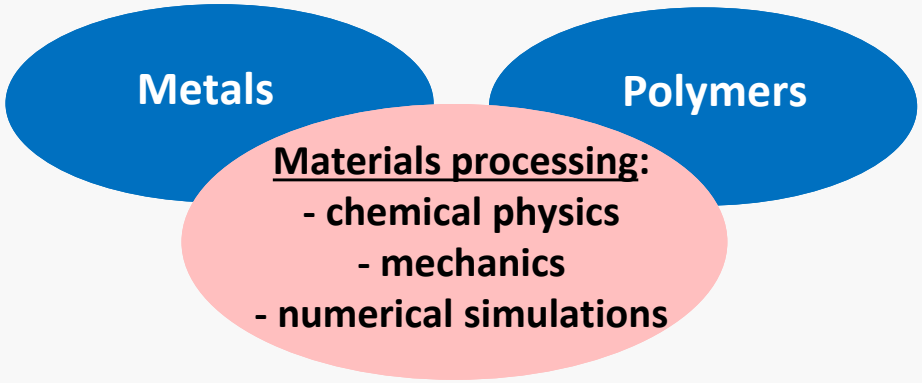
CEMEF: CENTER FOR MATERIALS FORMING

- Created in 1968
- Since 1979: a joint CNRS research unit due to the excellence in research

Our mission:

- **Top-level research**
- **Close collaboration with Industry**
- **Education via research**

Sophia Antipolis



Departments:

- Computational mechanics and physics
- Metal alloys
- Polymers and composites
- Surfaces and processes

- 33 professors
- 58 PhD candidates (35 foreigners)

- 4 industrial Chairs (large projects 50% financed by industry)
- Numerous distinctions: see https://www.cemef.minesparis.psl.eu/en/scientific-prizes/

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CEMEF: CENTER FOR MATERIALS FORMING

Topics proposed in the frame of ParisTech-CSC

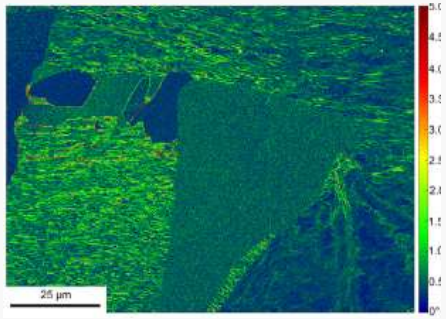
1) A Self consistent crystal plasticity model coupled to a mean field model

Challenge

Modelling microstructural evolutions → Optimizing material forming process → Improve properties

Approach

Plastic deformation → Stored energy through dislocations → Recrystallization ➔ grains size evolutions



Heterogeneity of dislocation density distribution in a polycrystal

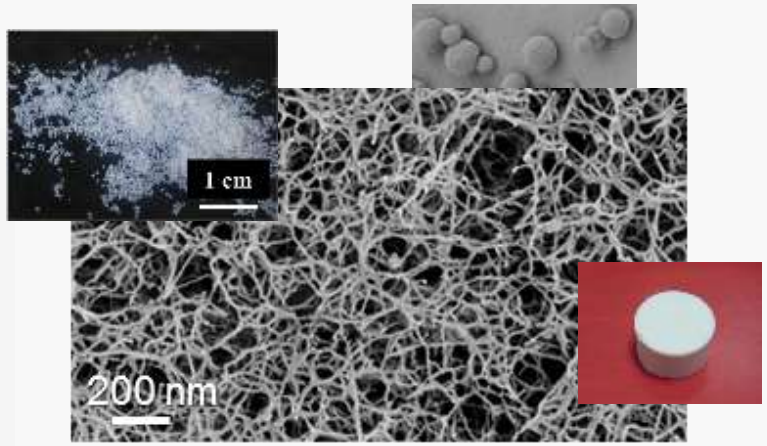
To develop a self consistent crystal plasticity model coupled to a mean filed model for microstructural evolution prediction

PhD advisor: F. Bay
PhD co-advisors: D. Muñoz, C. Moussa

2) 3D printing of gels and aerogels for biomedical applications

- Bio-aerogels are 100% natural polymer based ultra-lightweight nanostructured materials
- 3D printing will be used to make bio-based gels in complex shapes, which will be transformed into bio-aerogels.
- Rheology of solutions in the capillary of the printer nozzle will be studied experimentally and modelled using finite element analysis approaches developed in CEMEF

The goal is to use bio-aerogels as matrices for drug delivery in smart patches



PhD advisor: T. Budtova
PhD co-advisors: S. Buwalda, R. Valette

CGS - Centre for Management Science

Key figures
- 50 years
- Located in Paris
- 13 faculties, 4 post-docs, >30 PhD candidates
- 57 awards in last 5 years

4 research axes
- Theory of design and innovation
- Logistics & supply chain management
- Enterprise and governance models
- Human Resource Management

4 industrial chairs
- Design Theory and Methods for Innovation
- Urban Mines
- Theory of the Enterprise
- Physical Internet (host)

www.cgs.mines-paristech.fr

THE HOST RESEARCH TEAM : THE PHYSICAL INTERNET CHAIR

Faculties
Prof. Eric Ballot
Dr. Shenle Pan

Post-doc
Dr . Mariam Lafkih

PhD candidates
Mlle Yu Liu
Mlle Emilienne Lardy
Mr. Remy Scholler






CHAIRE INTERNET PHYSIQUE

Industrial Partners

Academic Partners

The proposed topic
Performance of interconnected logistics networks under uncertainty
Keywords
Logistics, Inventory, Resilience, Uncertainty, Modelling

eric.ballot@mines-paristech.fr or shenle.pan@mines-paristech.fr
www.cip.mines-paristech.fr

CRI, COMPUTER SCIENCE RESEARCH CENTER

- Permanent members: 6 researchers, 2 engineers
- Located in *Fontainebleau, Paris Area*

<u>Our expertise:</u> Programming Languages and their analyses

<u>Research Directions :</u>

- application paralellization (PIPS, http://pips4u.org/)
- code optimization (speed, memory, energy)
- heterogeneous code generation (GPU, DSP)
- program verification
- proof of programs (typing)
- Domain-Specific Languages
  - HPC, image processing (2D, 3D)
  - Cloud Computing
  - Audio signal, health, physics

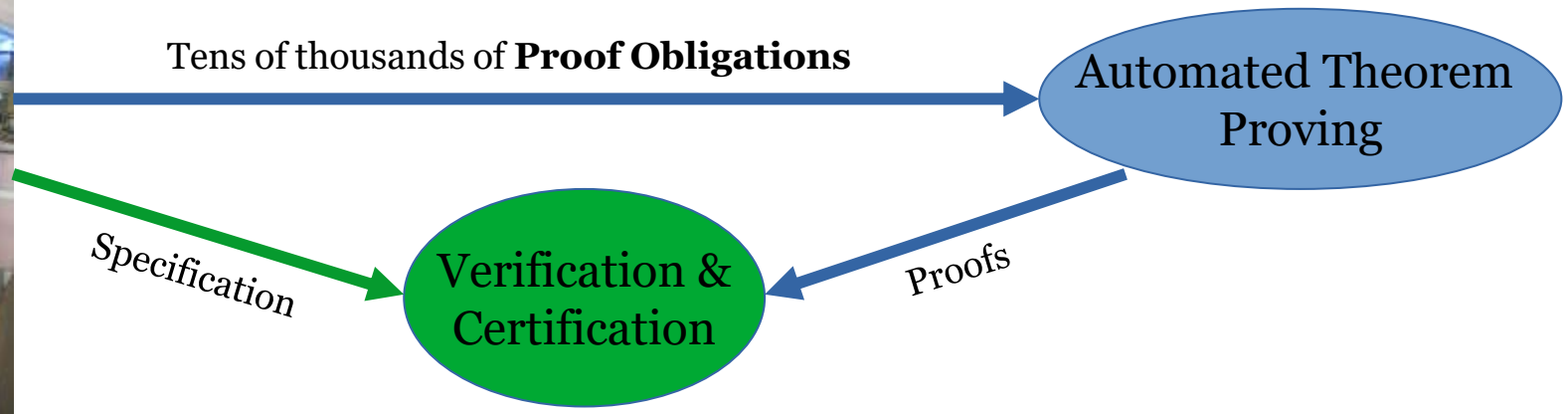
http://cri.mines-paristech.fr

MINES ParisTech | PSL

CRI, COMPUTER SCIENCE RESEARCH CENTER

PhD topic: Scaling-Up Polarized Deduction Modulo Theory

The domain of *Safety-Critical Software* : how to **prove** that a program is *bug-free* ?



Proposed Work Plan

1. Develop new automated proof-search algorithms
   - thousands of proofs = apply IA techniques to learn proof strategies
   - mix deductions and computations *within a theory*
2. Improve the verification process
   - work with third-party verifiers
   - increase drastically confidence in the code and its proof !

http://cri.ensmp.fr/~hermant/

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