



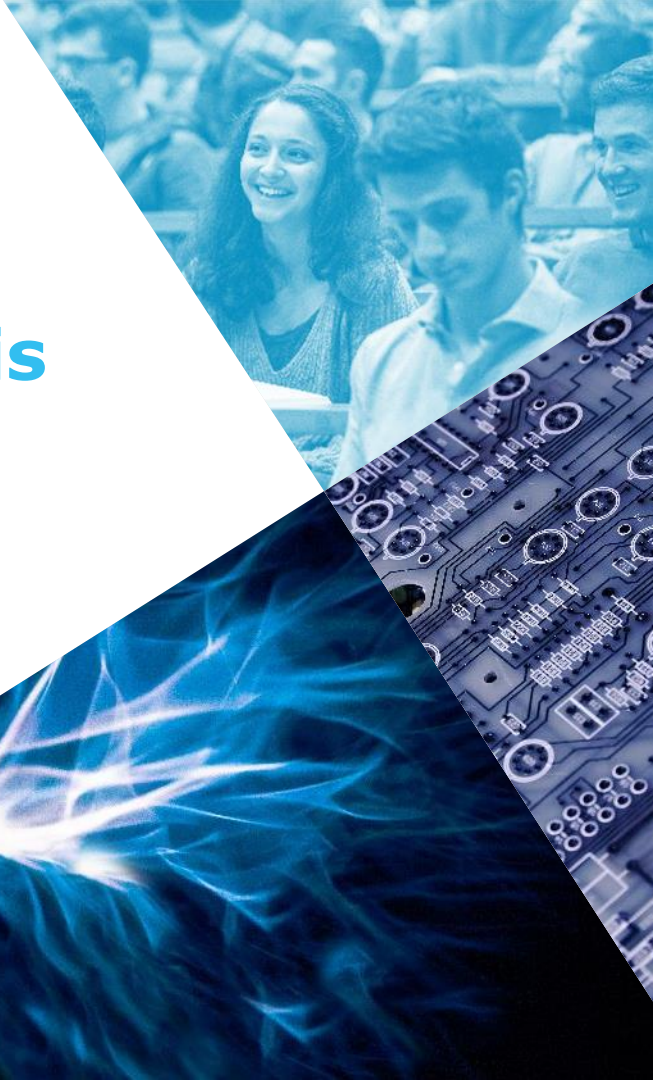
Institut Polytechnique de Paris

巴黎综合理工大学

Educate, Research & Innovate for a Better Future



ip-paris.fr





Institut Polytechnique de Paris – CSC Programme

**Enjoy research in a
World-class Institute of
Science and Technology !**

PhD programs @ IP Paris



IP Paris :

A World-class Institute of Science and Technology



N° 12 WORLD

N° 1 FRANCE



**THE WUR first entry:
95th World
3rd in France**

Physical Sciences n°22 worldwide, n°2 in France
Computer Sciences n°48 worldwide, n°2 in France
Life Sciences n°84 worldwide, n°4 in France



**QS WUR first entry:
49th World
2nd in France**



Shanghai WUR ranking:
Maths 37th, Physics 28th, Statistics 42nd



IP Paris : Identity & Objectives

5 INSTITUTIONS



Top French Graduate Schools
of Applied Sciences & Engineering
(« Grandes Écoles »)

3 MAIN OBJECTIVES

1

Providing top level education
in a wide range of fields

2

Leading cutting-edge research to
answer global challenges

3

Fostering innovation &
entrepreneurship

Educational programs of IP Paris and its schools



Bachelor



Engineer Degree



Master / MSc&T



PhD / PhD Track



Executive Master

Advanced Master

Executive Education



3 year

3 year

2 year

2 year + 3 year

14 months

8 000 students (39% international)

1000 Faculty members

1000 PhD students

30 Laboratories

3 incubators accompanying 800 start-ups

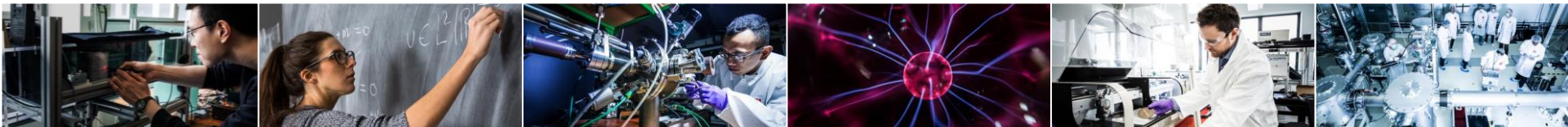
IP PARIS: KEY FACTS & FIGURES

- **Centuries of experience in education and research** (Since 1749)
- **World-Class Research Infrastructures**
- **A campus in the 8th global innovation hub**
30 min away from Paris
- **High employability rate**
95% employability rate after graduation
- **Strategic education & Research partnerships**
>40 corporate partners // >200 academic partners



Research @ IP Paris





Cutting-edge research to answer global challenges

30 Laboratories

2 500 Publications per year

1000 Faculty members

1000 PhD students

230 Post-doctoral students

10 Research & education departments

1 Grants' Office

Research @ IP Paris





10 Departments

- Department of Biology
- Department of Chemistry and Processes
- Department of Mathematics
- Department of Physics
- Department of Mechanics and Energetics
- Department of Computer Science, Data and Artificial Intelligence
- Department of Information, Communication and Electronics
- Department of Economics
- Department of Social sciences and Management
- Department of Humanities, Art, Literature and Languages

IP Paris Research Center



4 interdisciplinary centers on key societal challenges



E4C
INTERDISCIPLINARY
CENTER

Energy for Climate Center
addressing the systemic
complexity of energy transition



Interdisciplinary Center for
Defense & Security



Putting Artificial Intelligence and
Data Science at the service of
business and society



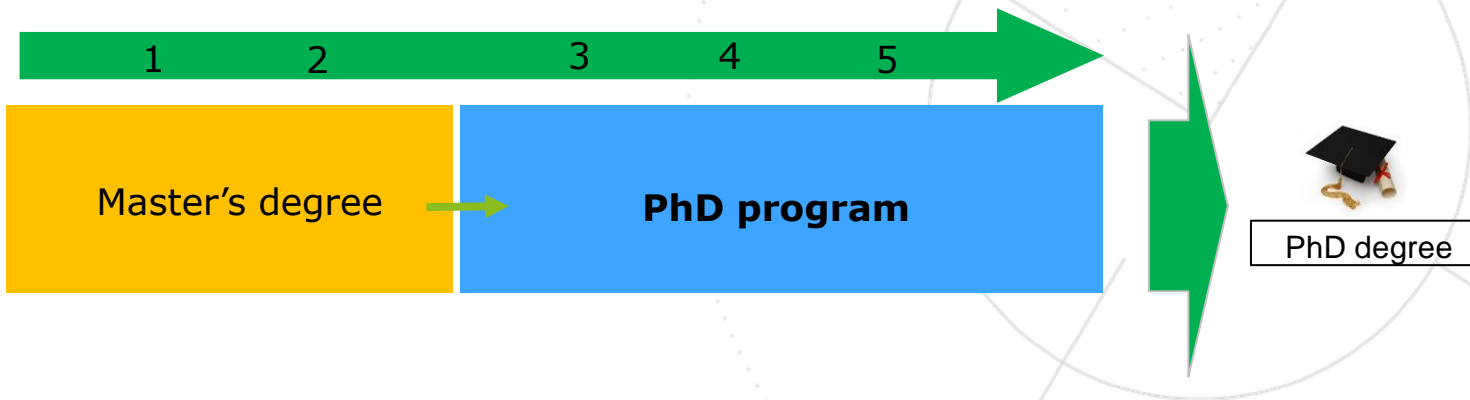
Biomedical Engineering Center to
be launched end of 2021



PhD programs @ IP Paris

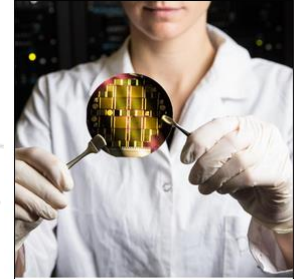


Research at IP Paris : PhD programs



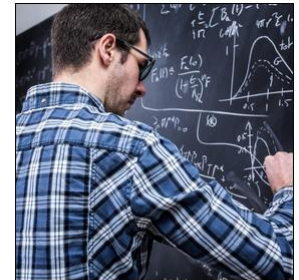
A focus on PhD programs

- Earn a PhD degree from a top ranked Institute of Science and Technology!
- IP Paris offers 3-year or 4-year PhD programs in a wide variety of disciplinary fields. The doctoral research conducted within IP Paris is based on 30 laboratories and takes place in a high-quality scientific environment. PhD students are also offered the opportunity to conduct their PhD with companies with renowned R&D Departments.
- **Two doctoral schools:**
 - ED IP Paris : **IP paris Doctoral School**, an interdisciplinary doctoral school, co-accredited with HEC Paris
 - EDMH : **Hadamard Doctoral School of Mathematics**, co-accredited with University Paris-Saclay and University PSL
- PhD graduates **recruited in top companies**
- **Personalized supervision** of PhD students in order to improve their training and increase their **employability**



IP Paris Doctoral School

[READ MORE](#)

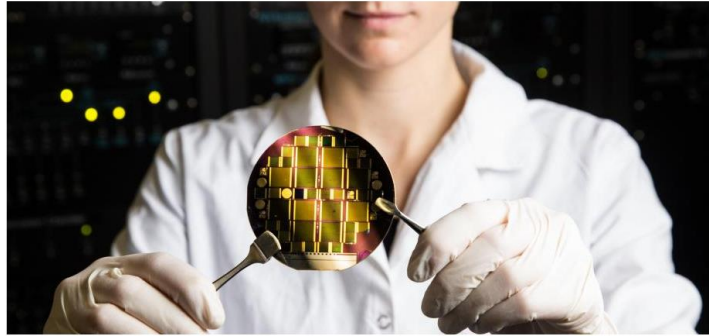


Hadamard Doctoral School of Mathematics

[READ MORE](#)

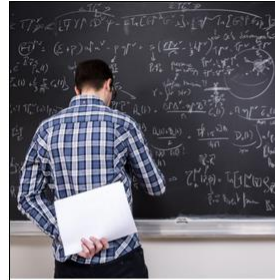
PhD programs at IP Paris

IP Paris Doctoral School

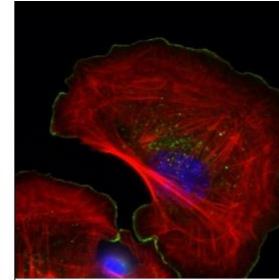


900 PhD students (45% international), supervised by more than 800 researchers in 30 research laboratories

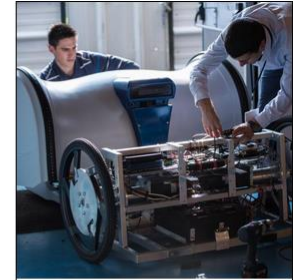
ED IP Paris offers a rich doctoral training through the research component ranging from basic research to applied research and prepares students for successful scientific career opportunities (research, teaching, project management, etc.) in universities and the private sector.



PhD in Physics



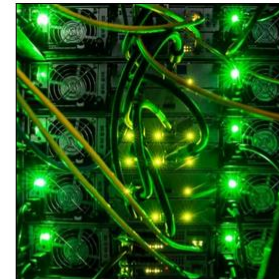
PhD in Biology and Chemistry



PhD in Engineering, Mechanics and Energy



PhD in Computing, Data and Artificial Intelligence



PhD in Information, Communications and Electronics

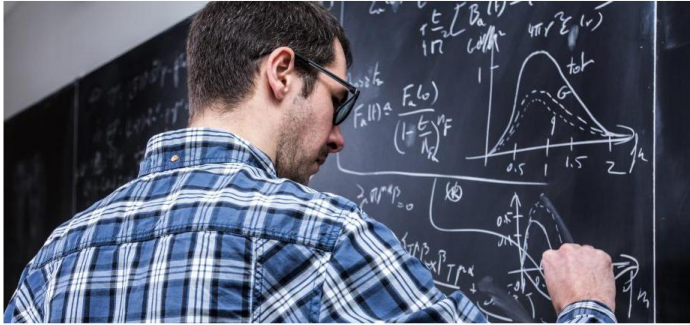


PhD in Economics, Management and Social Sciences



PhD programs at IP Paris

Hadamard Doctoral School of Mathematics



Training from pure mathematics to the most applied mathematics, including subjects at the interface with mathematics (particularly with economics, IT, mechanical engineering, physics, engineering, and life sciences). More than 300 PhD students, and more than 240 accredited PhD supervisors.

IP Paris laboratories associated to EDMH Doctoral School:

École polytechnique

- Centre de mathématiques appliquées
- Centre de mathématiques Laurent Schwartz

ENSTA Paris

- Unité de Mathématiques Appliquées de l'ENSTA Paris

ENSAE Paris

- Centre de Recherche en Économie et Statistique

Télécom Paris

- LTCI

Télécom SudParis

- SAMOVAR

PhD Admissions 2022-2023

- Open to students holding a Master's degree
- The training takes 3 to 4 years
- Specific PhD proposals for the IP Paris – CSC cooperation program are posted by IP Paris labs on the website of the two Doctoral schools
- Applications are submitted exclusively online on the website of the two Doctoral schools.

Admissions calendar:

- Opening of applications on **8 November 2021**
- Deadline for applications: **9 January 2022**
- Interviews from mid-January to mid-february

Applications:

- IP Paris Doctoral School

https://www.adum.fr/as/ed/proposition_Setab.pl?site=IPParis&type=Financement%20CSC

- Hadamard Doctoral School of Mathematics

<https://www.adum.fr/as/ed/proposition.pl?site=psedmh>



PhD proposals 2022-2023

Biology&Chemistry

Title	keywords	Link	School
Diversity and function of circular RNAs, from archaea to human cells	Circular RNA, Transcriptome, Biochemistry, Archaea	https://www.adum.fr/as/ed/voirproposition.pl?site=IPParis&matricule_prop=38860	École polytechnique
Lateral Gene Transfer of metabolic pathways in Asgard Archaea	Archaea, thymidylate and folate metabolism, genetics, synthetic biology, biochemistry	https://www.adum.fr/as/ed/voirproposition.pl?site=IPParis&matricule_prop=38766	École polytechnique
Organotransition metal catalysis for the cycloaddition of new 1,n-dipoles	Catalysis, Organometallic catalysis, Cycloadditions, Heterocycles	https://www.adum.fr/as/ed/voirproposition.pl?site=IPParis&matricule_prop=38845#version	École polytechnique
Collective total synthesis of polycyclic natural products through biomimetic cascade reactions	Organic chemistry, biomimetic synthesis, total synthesis, natural products	https://www.adum.fr/as/ed/voirproposition.pl?site=IPParis&matricule_prop=38862#version	École polytechnique
Regioselective functionalization of naphthalenes via metal catalyzed C-H activation: application to natural product synthesis	Catalysis, C-H activation, naphthalene, aromatic polyketides	https://www.adum.fr/as/ed/voirproposition.pl?site=IPParis&matricule_prop=38814	ENSTA
New approaches in Isocyanide Based Multicomponent Reactions	Multicomponent, isocyanide, catalysis, Ugi	https://www.adum.fr/as/ed/voirproposition.pl?site=IPParis&matricule_prop=38865	ENSTA
Hydrogen-biogas mixtures as alternative fuels: properties, combustion kinetics and innovative energy processes	Hydrogen, biogas, biomass, renewable energies, reaction kinetics, Thermodynamics	https://www.adum.fr/as/ed/voirproposition.pl?site=IPParis&matricule_prop=38842	ENSTA
Green Hydrogen Production by using TiO ₂ Photo-Catalysts Synthesized under Mild Conditions and Doped with Metal Nanoparticles	Green Hydrogen, Photocatalysis, Mild Synthesis, Titanium oxides, Metal nanoparticles, Pressure	https://www.adum.fr/as/ed/voirproposition.pl?site=IPParis&matricule_prop=38839	ENSTA

• **Learn more!**

PhD proposals 2022-2023

Mechanical engineering

Title	keywords	Link	School
Microstructure and micromechanics of natural halite for underground storage of hydrogen in deep salt caverns	Continuum mechanics, Mechanics of materials, Rock mechanics and physics, Experimental techniques, Imaging and image processing, Applied mathematics	https://www.adum.fr/as/ed/voir_proposition.pl?site=IPParis&matricule_prop=38694	École polytechnique
Development of an "intelligent" damping device	Shape memory alloys, Additive manufacturing, Damping, Cellular structures, Optimization	https://www.adum.fr/as/ed/voir_proposition.pl?site=IPParis&matricule_prop=38808#version	ENSTA
Gradient fatigue life models for materials and structures	Fatigue life , Gradient fatigue, Stress gradient, Material properties gradients, Energy models, Scale effect	https://www.adum.fr/as/ed/voir_proposition.pl?site=IPParis&matricule_prop=38920	ENSTA
Microstructure stored energy as indicator for fatigue of shape memory alloys	Shape memory alloys, Stored energy, Fatigue, multi-scale, Synchrotron , XRD	https://www.adum.fr/as/ed/voir_proposition.pl?site=IPParis&matricule_prop=38809	ENSTA

PhD proposals 2022-2023

Physics

Title	keywords	Link	School
Structural, electronic and magnetic instabilities in two-dimensional complex oxides	transition metal oxides, electronic structure, magnetism	https://www.adum.fr/as/ed/voirproposition.pl?site=1&PParis&matricule_prop=38863#version	École polytechnique
New Approaches to the Electronic Properties of Correlated Materials	Electronic Correlations, Electronic structure calculations	https://www.adum.fr/as/ed/voirproposition.pl?site=1&PParis&matricule_prop=38864	École polytechnique
Nonlocal collective electronic effects: from model systems to realistic materials	interacting electrons, collective fluctuations, magnetism	https://www.adum.fr/as/ed/voirproposition.pl?site=1&PParis&matricule_prop=38861	École polytechnique
Propagation of quantum information in correlated quantum systems	Quantum entanglement, Quantum simulation, Out-of-equilibrium dynamics	https://www.adum.fr/as/ed/voirproposition.pl?site=1&PParis&matricule_prop=38806	École polytechnique
Quantum simulation of quasicrystals with ultracold atoms	Quantum simulation, Ultracold atoms	https://www.adum.fr/as/ed/voirproposition.pl?site=1&PParis&matricule_prop=38805#version	École polytechnique
Gamma-ray polarimetry of the Vela pulsar with the Fermi LAT	pulsar, polarimetry, gamma-ray	https://www.adum.fr/as/ed/voirproposition.pl?site=1&PParis&matricule_prop=38751	École polytechnique
Coupled propagation of homogeneous ionization waves at a plasma-semiconductor interface	streamer, electron-hole plasma, nanosecond discharge, dielectric barrier discharge	https://www.adum.fr/as/ed/voirproposition.pl?site=1&PParis&matricule_prop=38854	École polytechnique
Cold Plasma jets for biomedical applications	cold plasma, plasma medicine, biomedical applications	https://www.adum.fr/as/ed/voirproposition.pl?site=1&PParis&matricule_prop=38859	École polytechnique
In-situ Raman spectroscopy of low-temperature plasma-liquid interfaces	operando spectroscopy, vibrational spectroscopy, low-temperature plasma	https://www.adum.fr/as/ed/voirproposition.pl?site=1&PParis&matricule_prop=38857#version	École polytechnique
Time propagation of photoexcited carrier populations: theoretical study of electron-phonon coupling and of carrier relaxation dynamics in materials for potential photovoltaic and thermoelectric applications.	electron-phonon coupling, density functional theory, semiconductors, time-resolved spectroscopy	https://www.adum.fr/as/ed/voirproposition.pl?site=1&PParis&matricule_prop=38815#version	École polytechnique
STRUCTURE AND PROPERTIES OF DENSE SILICA PHASES	silica glass, densification, Irradiation	https://www.adum.fr/as/ed/voirproposition.pl?site=1&PParis&matricule_prop=38744#version	École polytechnique

• **Learn more!**

PhD proposals 2022-2023

Information technology, Data, AI

Title	keywords	Link	School
Compiling Mathematical Functions in Biochemical Reaction Networks	analog computing, symbolic computation, bioinformatics	https://www.adum.fr/as/ed/voir proposition.pl?site=IPParis&matricule_prop=38858	École polytechnique
Logical Models of Multi-scale Biological Processes	bioinformatics, boolean networks	https://www.adum.fr/as/ed/voir proposition.pl?site=IPParis&matricule_prop=38856	École polytechnique
Network Autoregressive Processes model	Network autoregression, High dimensional time series, VAR model	https://www.adum.fr/as/ed/voir proposition.pl?site=IPParis&matricule_prop=38850#version	ENSAE
Contextual Machine Learning for Natural Social Robot Behaviors	social robotics	https://www.adum.fr/as/ed/voir proposition.pl?site=IPParis&matricule_prop=38968	ENSTA
Trust and explainable AI in robot failures in human-machine collaborations	social robotics	https://www.adum.fr/as/ed/voir proposition.pl?site=IPParis&matricule_prop=38968	ENSTA
Socio-Affective Touch in Robotics	social robotics	https://www.adum.fr/as/ed/voir proposition.pl?site=IPParis&matricule_prop=38970	ENSTA

PhD proposals 2022-2023

Information technology, communication, electronics

Title	keywords	Link	School
Mixed Signal Accelerator for AIoT	AIoT, Embedded Systems, Machine Learning, Bio-Inspired Architecture and Circuit, In-memory Computing, Mixed Signal Accelerator	https://www.adum.fr/as/ed/voir_proposition.pl?site=IPParis&matricule_prop=38834#version	Télécom Paris
AIoT and Neurofeedback for Cognitive Training Acceleration	AIoT, Neurofeedback, Pattern recognition, neural network, attention, cognitive	https://www.adum.fr/as/ed/voir_proposition.pl?site=IPParis&matricule_prop=38852#version	Télécom Paris
MIMO and Massive MIMO Antenna Surrogate Modeling Based on Machine Learning and other Order Reduction Techniques for Multi-Antenna System Optimization in the Context 5G & Beyond Wireless Networks		https://www.adum.fr/as/ed/voir_proposition.pl?site=IPParis&matricule_prop=38973#version	Télécom Paris
Statistical Modeling of MIMO and Massive MIMO Antennas Disturbed by their Close Environment, based on Machine Learning and other Regression Techniques, in the Context 5G & Beyond Wireless Networks		https://www.adum.fr/as/ed/voir_proposition.pl?site=IPParis&matricule_prop=38972#version	Télécom Paris
Open-Data driven Optimization of Urban Mobility via Reinforcement Learning	Reinforcement Learning, Mobility, Open data, Smart cities	https://www.adum.fr/as/ed/voir_proposition.pl?site=IPParis&matricule_prop=39025#version	Télécom SudParis

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