



École des Ponts
ParisTech



March 2021

ÉCOLE DES PONTS PARISTECH
Building the worlds of tomorrow



École des Ponts

ParisTech

A world-class Higher Education and Research Institution

- A public engineering school recognised for the excellence of its graduate studies
- Founded in 1747
- International outlook
- A unique combination of fundamental and applied sciences, to transform business and society.
- Flexible and interdisciplinary engineering curriculum
- Leading to executive careers
- Striving for the ecological and digital transition



École des Ponts

ParisTech

A long and prestigious history

The oldest School of engineering in Europe

- **1747:** École nationale des ponts et chaussées founded by King Louis XV
- **1851:** First research laboratory
- **1988:** 1st Double Degree agreement with international universities
- **1997:** Relocation in Marne-la-Vallée, Green City Campus
- **2017:** National HEI Program “Inventing the City of Tomorrow”



Henri Becquerel
1852-1908
-Physicist-
Nobel prize 1903



Augustin Cauchy
1789-1857
-Mathematician-
One of the founders of modern analysis



Eugène Freyssinet
1879-1962
-Engineer, entrepreneur-
The father of prestressed concrete



Louis Ménard
1931-1978
-Engineer-
Developer of the pressiometer



Claude-Louis-Marie-Henri Navier
1785-1836
-Engineer, scientist-
Inventor of general theory of elasticity



Jean Résal
1854-1919
-Engineer-
Builder of the pont Mirabeau and pont Alexandre III in Paris



Jean Tirole
1953-...
-Economist-
Nobel prize 2014



Louis Joseph Vicat
1786-1861
-Engineer-
Inventor of concrete



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École des Ponts ParisTech Alumni in industry and in government



Elisabeth Borne
Ponts 86
Minister of Labour and
Employment



François Bertière
Ponts 74
CEO Bouygues
Immobilier



Diane D'Arras
Ponts 77
President of IWA, former
VP SUEZ Environnement



Fabrice Fourcade
Ponts 89
CEO EDF China



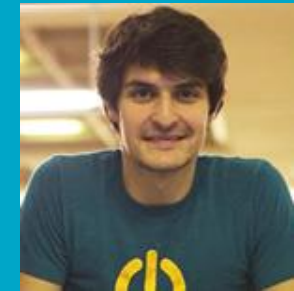
Antoine Frérot
Ponts 82
CEO Véolia



Mostafa Terrab
Pont 79
CEO OCP Group



Benoit de Ruffray
Ponts 1993
CEO Eiffage



Thibault Duchemin
Ponts 2013
Founder AVA



École des Ponts
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Remarkable works, designed by Ecole des Ponts ParisTech Alumni



Viaduc Millau - Michel Virlogeux



Gardens by the Bay (Singapore)
© Atelier one – passage project



Beijing Opera © Paul Andreu



Cristo Redentor
Albert Caquot



École des Ponts

ParisTech

Rankings and certification



International QS Rankings 2020: +13 spots over last year.

#250 worldwide

#8 France



2019 THE (Times Higher Education) international ranking: +50 spots over last year.

#201-250 worldwide

#5 France / #2nd “Grande Ecole” France



National Etudiant ranking 2020:

#3 France



Choose France certification

Highest level of certification of welcome procedures and programmes for international students



AFAQ ISO 9001 certification

Quality management



École des Ponts
ParisTech

International partnerships

71 partner universities

IN 35 countries

ON 4 continents

47 double-degree agreements with universities

IN 25 countries

1 European University



Europe:
39 partner universities
19 double-degrees
20 Erasmus exchange agreement

ETH zürich

Imperial College London



TU Delft



POLITECNICO DI MILANO

Asia:
9 partner universities
8 double-degree
1 exchange agreement

MIT
MANAGEMENT
SLOAN SCHOOL



Americas
16 partner universities
13 double-degree
3 exchange agreements



4 Global Initiatives

Programme de Formation d'Ingénieurs d'Excellence - PFIEV (Vietnam)
Co-Innovation Center (Tongji, Shanghai)
Joint Education and Research Center (UM6P, Maroc)
Capacity Building Program funded by the WorldBank (INP-HB, Côte d'Ivoire)

Africa / Middle-East :
9 partner universities
6 double-degrees
2 exchange agreements



東京大学
The University of Tokyo





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Governance and funding

- **State-owned institution:**
 - Reports to the Ministry for the Ecological and Inclusive Transition and to the Ministry of Higher Education, Research and Innovation
- **Governing bodies:**
 - Board of Directors, 24 seats, 8 for industry representatives
 - Graduate School Council
 - Scientific Council
- **Funding:**
 - Annual budget: 47 M€
 - 50% by the Ministry for the Ecological and Inclusive Transition
 - 50% by industry



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Key facts and figures

Students :

- 870 students in the MSc in engineering / Diplôme d'ingénieur
- 130 in Master's programmes
- 300 in Advanced Master's programmes
- 500 PhD candidates and postdocs
- 200 in Business Administration programmes

i.e. a total of: **2 000** students, **25%** female

45% international students, **45** nationalities

1 200 instructors (academics, researchers, business practitioners)

12 research laboratories

300 permanent scientists

7 labs of excellence

50 PhD defense / year

6 EUR, **3** ERC

14 education and research chairs

1000 rank A publications, including **45%** with a foreign partner



École des Ponts
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Close links with industry

Transportation,
environment,
urban services

Consulting

Energy

Construction

Industry

Finance



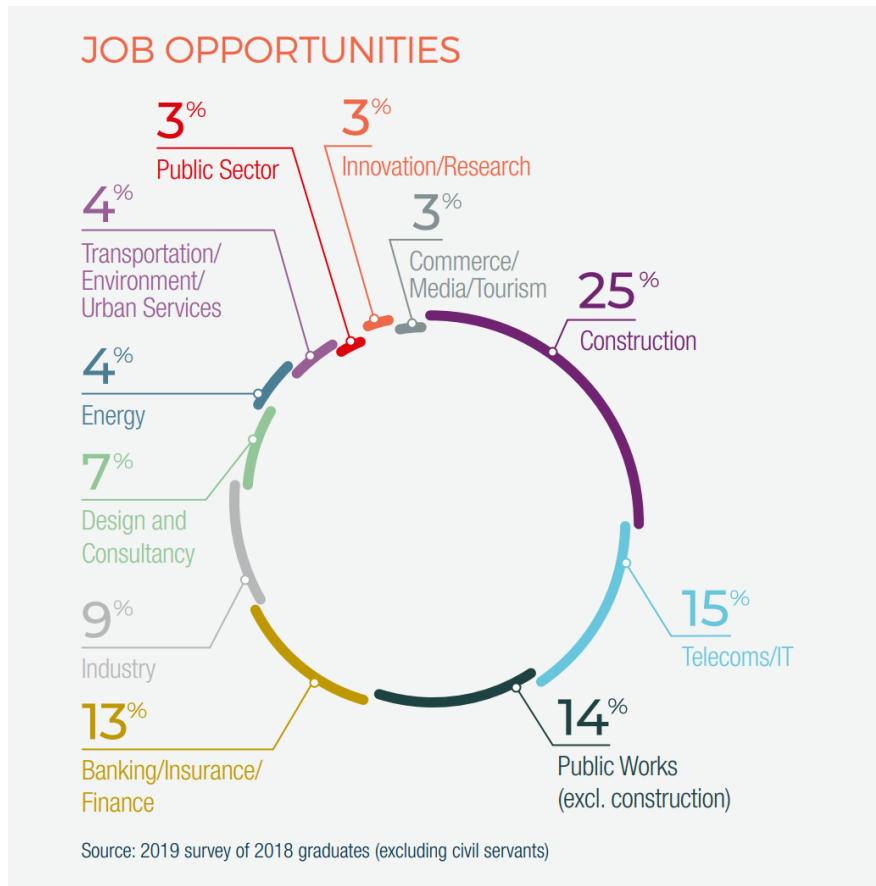
École des Ponts

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Careers and placement

AVERAGE SALARY
IN FIRST JOB

€46,900 | €52,500 with bonuses



85% of engineering students are hired before graduation



École des Ponts

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Our fields of excellence

- Civil engineering / Environment / Transportation / Urbanism
- Applied mathematics / Computer science / Data sciences
- Mechanics / Materials Science
- Industrial engineering / Robotics / Supply Chain
- Economics / Finance / Sustainable development



École des Ponts

ParisTech

Academics: Departments of studies

- **Civil and Structural Engineering**

Complex projects, site work organisation, innovation of new materials and construction technologies

- **City, Environment, Transportation**

Planification of complex urban systems and operation of urban services (transportation, water,...)

- **Mechanical Engineering and Material Science:**

Research and design of new products and materials in the fields of energy or transportation

- **Industrial Engineering:**

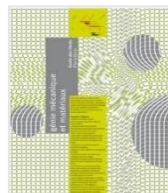
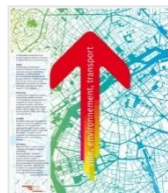
Innovation and supply chain. Robotics.

- **Economics, Management, Finance:**

Financial engineers(financial engineering, project finance, public/private partnerships) and economist engineers (urban, environment, transportation, construction and economic regulation)

- **Applied Mathematics and Computer Science:**

Modelisation of complex systems ; analysis of financial, industrial or natural risks ; challenges within big data





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Academics: Specific Engineering Areas | Departments of humanities

Specific Engineering Areas

Energy

Energy Transition At Local Scale, Management of energy projects, Nuclear Energy, Energy efficient buildings, Transport and Sustainable Development...

Robotics

Mechanical engineering, Advanced Robotics, Design by Data, Industrial Systems Design & Robotics

Data Sciences

Applied mathematics, Mathematics for Finance and Data, Mathematics, Vision, Learning, Design by Data

Departments of Humanities

Languages and Cultures

French as a Foreign Language Certified Center



Pre-arrival seminars, intensive French courses.

17% of study time dedicated to foreign languages, 10 taught languages, study trips, debates, tandem language learning.

Humanities and Social Sciences

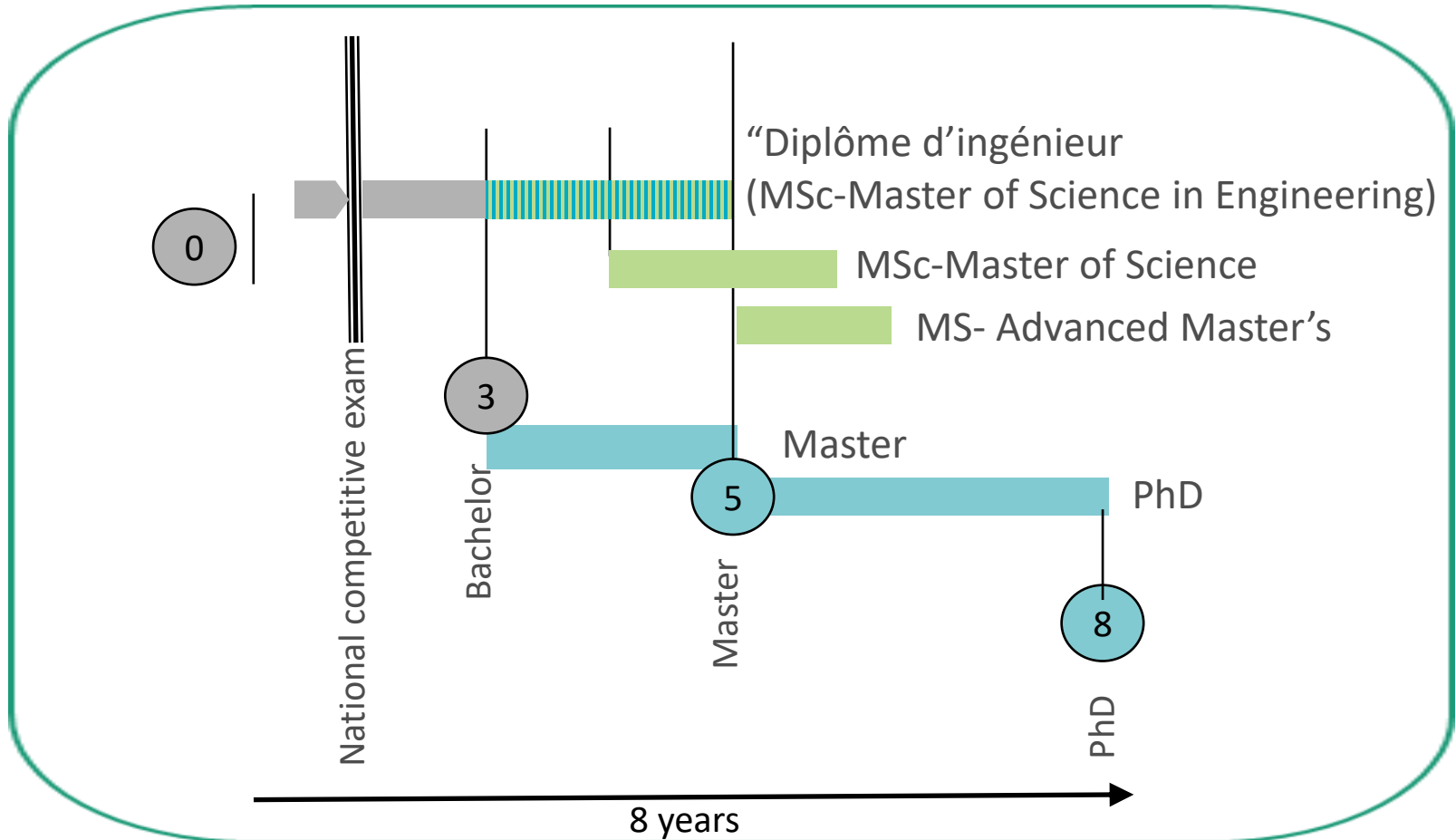
History of engineering, Corporate communications, Sociology, Movies and Workplace



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Academics: graduate programs



Industry-oriented
Research-oriented



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« Diplôme d'ingénieur » (MSc in engineering)



FIRST YEAR (Bachelor cycle – senior year)

- Consolidation of scientific and general knowledge,
- projects (research and academic)
- Work experience: the year ends with a 4 week hands-on internship in a company

2nd & 3rd YEAR (Master cycle)

2nd Year: choice of a Department of studies

- Civil and structural engineering
- City, environment, transportation
- Mechanical engineering and materials science
- Industrial engineering
- Economics, Management, Finance
- Applied mathematics and computer science

Year 2 internship

- Between the 2nd and 3rd Year, **80 % of the class opt for a long internship** (1 year), more than 30 % of them abroad.
- The other students undertake a short internship in a company or research laboratory (3 months), 20% of them abroad.

Year 3 Final Year Project (PFE)

Over minimum 4 months, students apply the skills acquired in their programme to a scientific or technical problem, in a company or research laboratory either individually or in a group (Ponts Team Project).

Courses	Courses	Internship (4 weeks)	Courses	Courses	Internship (2 months > 10 months)	Courses	Final project (4 months > 6 months)
> YEAR 1			> YEAR 2			> YEAR 3	



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« Diplôme d'ingénieur » (MSc in engineering)_International students

Bachelor cycle

At home institution

Master cycle

At Ecole des Ponts ParisTech

> Choice of a Department of studies

- Civil and structural engineering
- City, environment, transportation
- Mechanical engineering and materials science
- Industrial engineering
- Economics, Management, Finance
- Applied mathematics and computer science

Industrial internship

- 3 months or 1 year
- France or abroad

Final Project / Master thesis

- For at least 4 months, students apply the skills acquired in their programme to a scientific or technical problem, in a company or research laboratory, either individually or in a group (Ponts Team Project).
- Can be done at home university



Human-sized classes

35% international

25 nationalities

Bachelor	Master courses (for RU)	Master courses	Master courses	Internship	Master courses	Final project / Master thesis
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> Home university

> Ecole des Ponts ParisTech

> Ecole des Ponts or home university



International Master's programmes

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International masters

- Masters in Transport and Sustainable Development (TRADD)
- Master in Water, Soil and Waste Management and Treatment (GTESD)
- Master Internacional en Empresa y Políticas Públicas (MIEPP) – institutional degree (Madrid)

UIMP
Universidad Internacional
Menéndez Pelayo



MSc

- Economic Decision and Cost Benefit Analysis (EDCBA)



Master's programmes


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Applied Mathematics

- Probabilities and random models (PMA)
- Mathematics of finance and data (MFD)
- Mathematics, Vision, Learning (MVA)
- Modelling, Analysis, Simulation (MAS)
- Operational Research (RO)

Energy option

-  • Decommissioning and Waste Management (DWM)
- Energy Transition and Territories (TET)


Mechanical Engineering

- Multiscale Analysis for Materials and Structures (AMMS)
- Durability of materials and structures (DMS)

Civil Engineering

- Mechanics of Soils, Rocks, and Structures in their Environment (MSROE)

Materials Science and Engineering

-  • Materials science for sustainable construction (SMCD)

Transportation, Mobility, Networks

- Transportation, Mobility (TM)

Environmental, Energy, and Transportation Economics

- Environmental Economics
- Energy Economics
- Forward Modelling

Quantitative Economics

- Analysis and Political Economy (APE)
- Public Policies and Development (PPD)



Advanced Master's programmes Executive Education



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FULL-TIME

- Planning and Urban Commissioning
- Urban Engineering and Information Technology (Urban ICT)
- European civil engineering
- Engineering of Large Energy Structures
- Public Policy for Sustainable Development

PART-TIME

-  • Design by Data, Computational Design, Digital Manufacturing and Building Technologies
- Sustainable Real Estate and Building, energy transitions and digital technology
- BIM, Integrated Design and Life Cycles of Buildings and Infrastructures
- Smart Cities Engineering and Management
- Decision Support and Geolocated Information Systems
- Rail and urban transit systems
- Smart Mobility - Digital transformation of mobility systems
- Supply Chain Design & Management
-  • Infrastructure Project Finance
-  • Advanced Public Action Morocco
-  • Management of Energy Projects



École des Ponts

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PhD Programmes

- City, Transportation, and Territories
- Sciences, Engineering, and Environment
- Mathematics and ICT
- Organizations, Markets, Institutions
- Agriculture, Food, Biology, Environment and Health
- Social Science
- Environmental Sciences
- Astronomy and Astrophysics
- Mechanical, Energy, Materials Sciences and Geosciences
- Economics

English-speaking
environment



Choose PhD@Ecole des Ponts ParisTech for:

- International perspective
- Close links with industry
- Impact on public policies and sustainable development



École des Ponts

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Business Administration programmes



-  • Executive DBA (Paris – New York)
-  • LEADTECH Global Executive MBA (Paris – Barcelona – Singapore – Silicon Valley)
- Global Executive MBA (Casablanca)
- Executive Certificates (Africa)
-  • Executive MBA in aviation management with Tsinghua University (Beijing)
-  • DBA –Intelligent Manufacturing Management- (Shanghai)
-  • Certificate in Innovation and Technology Management (Paris)





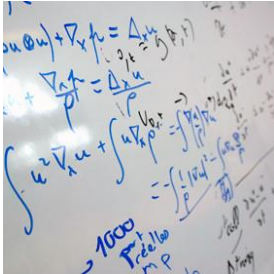

Ecole des Ponts

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Non-Degree English-taught Programmes



Full Ecole des Ponts ParisTech student experience / 1 semester / 500€/semester

Level	Topic	Academic program	Specifics
Bachelor-senior students	Applied Mathematics 	Mathematical tools for engineer Analysis and scientific computing Optimization Probability Introduction to programming Statistical physics Operational research and optimization Statistics & data analytics Language (French) Sport Project within lab	Bespoke academic supervision and small class teaching Full Ecole des Ponts ParisTech student and research experience
Graduate students	Green Finance 	Physics of climate change Energy economics ESG analysis Green financing Conferences Credit Risk Management of Climate Risks Project Finance Life Cycle Analysis Capstone Projects	Extension to 1 semester of research at CIRED laboratory



École des Ponts

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An entrepreneurial ecosystem for students

- Entrepreneurship courses
- 3 incubators (Descartes, GreenTech and Station F)
- Annual Hackathon: « One night to launch a startup »
- Access to research equipment and mentorship
- Special awards, and seed-funds from Fondation des Ponts



Successful start-ups



Daylight system
with fiber optic



Roof mounted
small wind turbine



From 2D to 3D

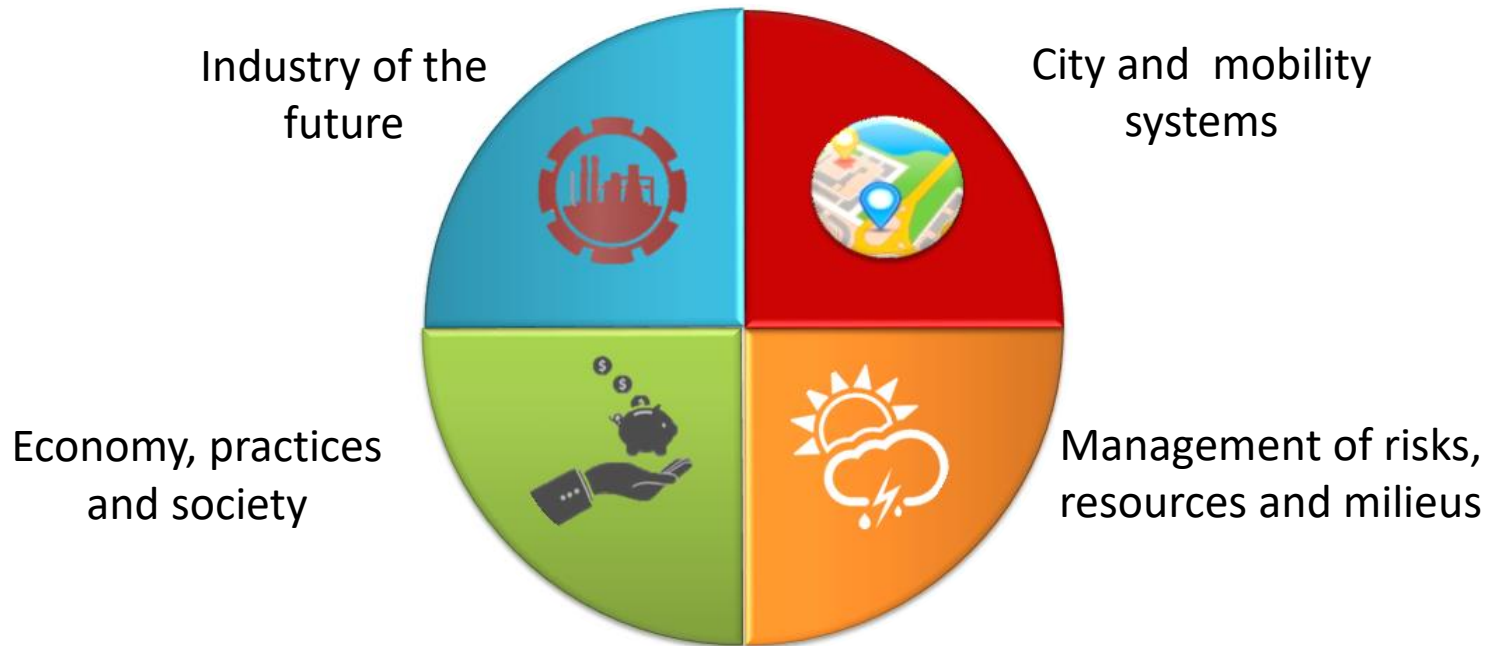


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Research for the ecological and digital transition

A challenge-based approach to address 4 socio-economic issues of sustainable development





École des Ponts

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Research for the ecological and digital transition

- Ecomaterials
- Digital Manufacturing
- Innovative Structures
- Geomechanics

NAVIER

- Sustainable mobility
- Territorial dynamics

LVMT

- Modelisation of uncertainty
- Digital simulation
- Systems optimisation

CERMICS

LEESU

- Urban waters
- Alternative resources

- Data processing
- 3D vision
- Big data

LIGM

CEREA

- Atmospheric environment
- Air quality
- Renewable energy

- Cities of the future
- Infrastructures
- Practices

LATTS

HM&Co

- Hydro-meteorological risks
- Resilient cities

- Public policies
- Environmental economy
- Markets and governance

PjSE

LMD

- Physics of atmosphere
- Climate

CIRED

LHSV

- Sustainable development
- Climate change

- Renewable energy
- Natural risks



Research for the ecological and digital transition

- Predictive Maintenance



➤ Industry 4.0: how to use data to enhance competitiveness



Research for the ecological and digital transition

- Renewable Energy



- Onshore and offshore marine energy
- Wind farms and solar
- Smart grids



ADEME



Agence de l'Environnement
et de la Maîtrise de l'Énergie



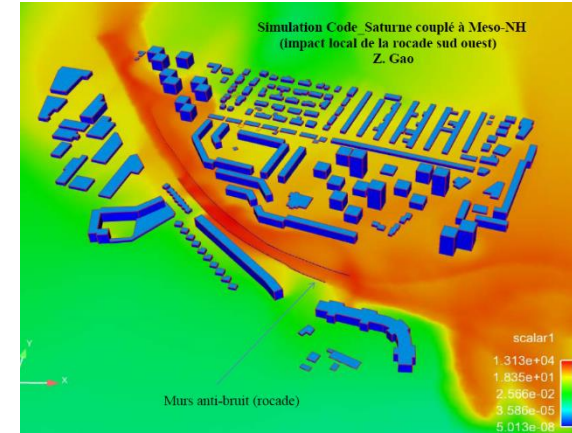


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Research for the ecological and digital transition

- Resilient Cities: mobility, water, air.



- Smart & Sustainable Mobility



- Extreme rains



- Air Quality



Research for the ecological and digital transition

- Sustainable buildings and infrastructures



- Ecodesign of buildings and infrastructures

- Materials Science for Sustainable Construction

- Green roof performance





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The Co-Innovation Lab

Collaborative platforms improving transfer to industry



Fresnel : multi-scale observation and modelling platform for resilient cities
X-band dual polarisation weather radar, lidars, disdrometer...

Build'In : building systems and artificial intelligence, materials and structures optimisation, industrial processes
Robotic hall, large-scale additive manufacturing unit, concrete and composite materials modelling
...

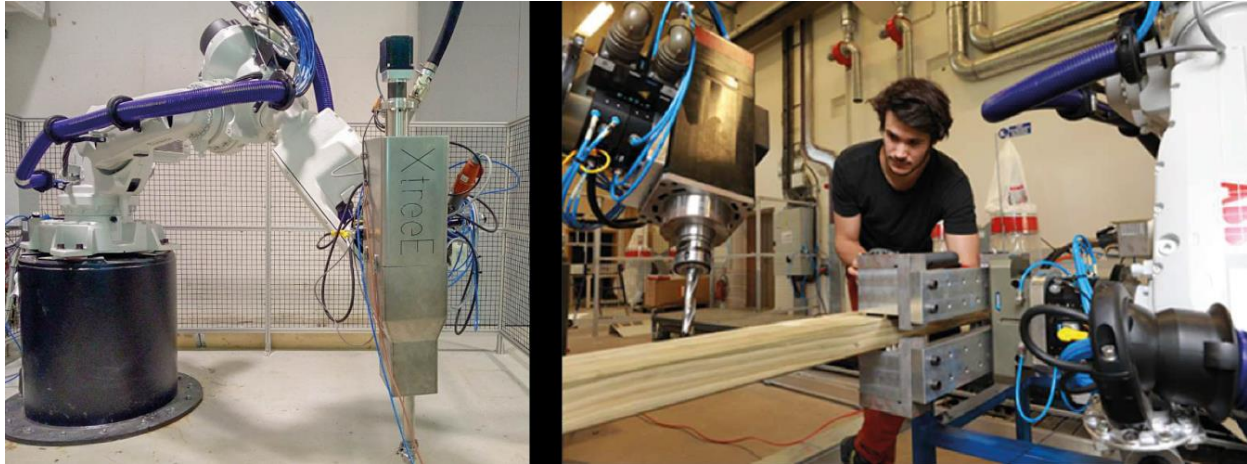
M μ : urban mobility modelling, new behaviors, infrastructures and urban planning, impact of public policies
Softwares, traffic simulators...



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Maker space | d.school



Makerspace

- 3D Printing,
- Laser cut
- 4 poles (ceramic, wood, steel, water, electronics)

d.School Paris

Design Thinking as an approach to innovation and its management

56 CORPORATE PARTNERS

74 PROFESSIONAL PROJECTS

100 ALUMNI EXPERTS



- innovate – collaborate – share -



École des Ponts

ParisTech

Library, Heritage and Publishing.

La Source, Learning Center

- 250 seats
- 200 000 documents
- Open 71 hours/week

Scientific information services for researchers

- 25 000 scientific publications
- HAL ENPC Open Science Plan (65% publications in open access)

Archives

- Exceptional heritage
- Ancient manuscripts and maps since the 18th century.



Presse des Ponts

- 220 books and scientific and technical software applications primarily in the fields of civil and structural engineering, and spatial planning

Campus Cité Descartes Greater Paris green cluster



- Housing (on campus or in Paris center)
- Sport facilities
- Vibrant campus life
- 15 student societies
- 20' from Paris center (direct urban train)
- International students welcome desk with « Feel Français »





École des Ponts

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Alumni endowment and support



- 22 000 alumni worldwide, holding leadership positions in 100 countries
- 14 international groups
- Bespoke mentoring for international students over their stay in France
- Support for careers and internships



Fondation des Ponts

- Special scholarships program for international students
- Scholarships from corporate donors (Meridiam, OCP Group, LafargeHolcim, Saint-Gobain, Veolia)
- Excellence awards
- A powerful network of donors



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www.enpc.fr/en

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