

École des Ponts
ParisTech



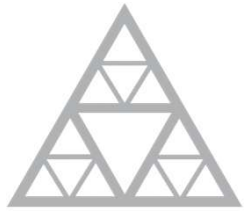
May 2020

ÉCOLE DES PONTS PARISTECH
Building the worlds of tomorrow



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



Ecole des Ponts ParisTech Alumni in industry and in government



Elisabeth Borne
Ponts 86
Minister of the
Ecological Transition



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

Remarkable works, designed by Ecole des Ponts ParisTech Alumni



Viaduc Millau - Michel Virlogeux



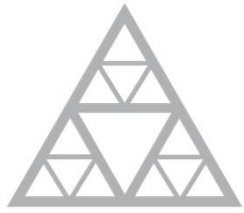
Beijing Opera © Paul Andreu



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



**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



l'Étudiant

National Etudiant ranking 2019:

#3 France



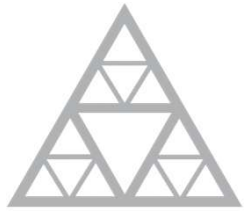
Choose France certification

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

45 double-degree agreements with universities

IN 25 countries



ETH zürich

Imperial College London



POLITECNICO DI MILANO

Europe:
39 partner institutions
19 double-degree agreements
20 Erasmus+ exchange agreements

Asia:
9 partner institutions
8 double-degree agreements
1 bilateral exchange agreement

Americas:
15 partner institutions
12 double-degree agreements
3 bilateral 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)



東京大学
THE UNIVERSITY OF TOKYO



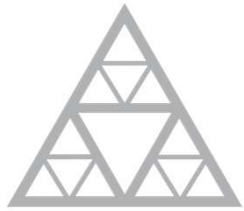
NUS
National University of Singapore



Africa and the Middle East:
9 partner institutions
6 double-degree agreements
2 bilateral exchange agreements

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



École des Ponts
ParisTech

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, **30%** female

almost **50%** international students

1 200 instructors (academics, researchers, business practitioners)

12 research laboratories

7 labs of excellence

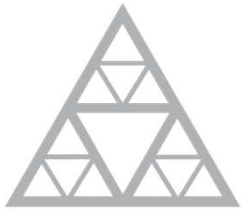
6 EUR, **3** ERC

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

300 permanent scientists

50 PhD defense / year

14 education and research chairs



École des Ponts
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Close links with industry



Transportation,
environment,
urban services



Consulting



Energy



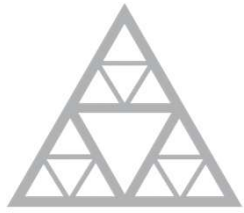
Construction



Industry



Finance

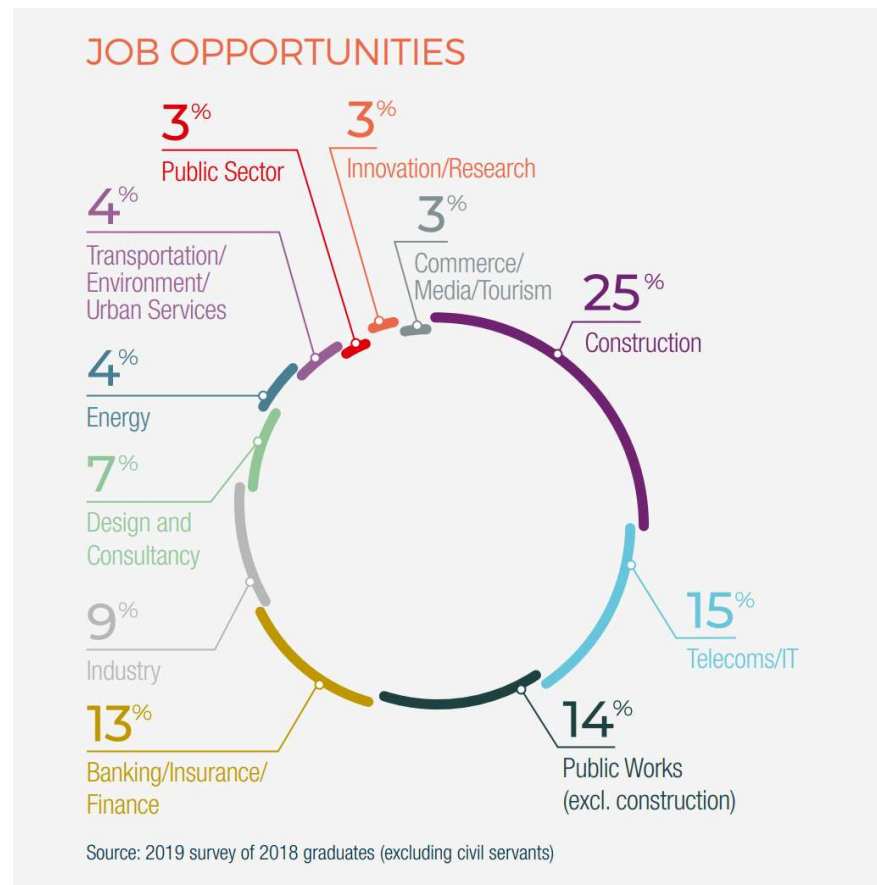


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Careers and placement

AVERAGE SALARY
IN FIRST JOB

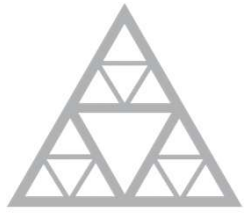
€46,900 | €52,500 with bonuses



85% of
engineering
students are
hired before
graduation

Our fields of excellence

- Mechanics / Materials Science
- Industrial engineering / Robotics / Supply Chain
- Civil engineering / Environment / Transportation / Urbanism
- Applied mathematics / Computer science / Data sciences
- 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:**

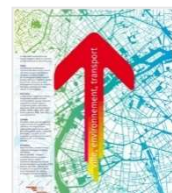
Innovation and supply chain. Robotics.

- **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





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

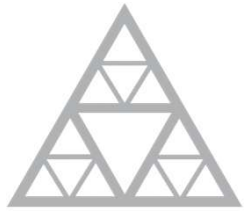


Pre-arrival seminars, intensive French courses.

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

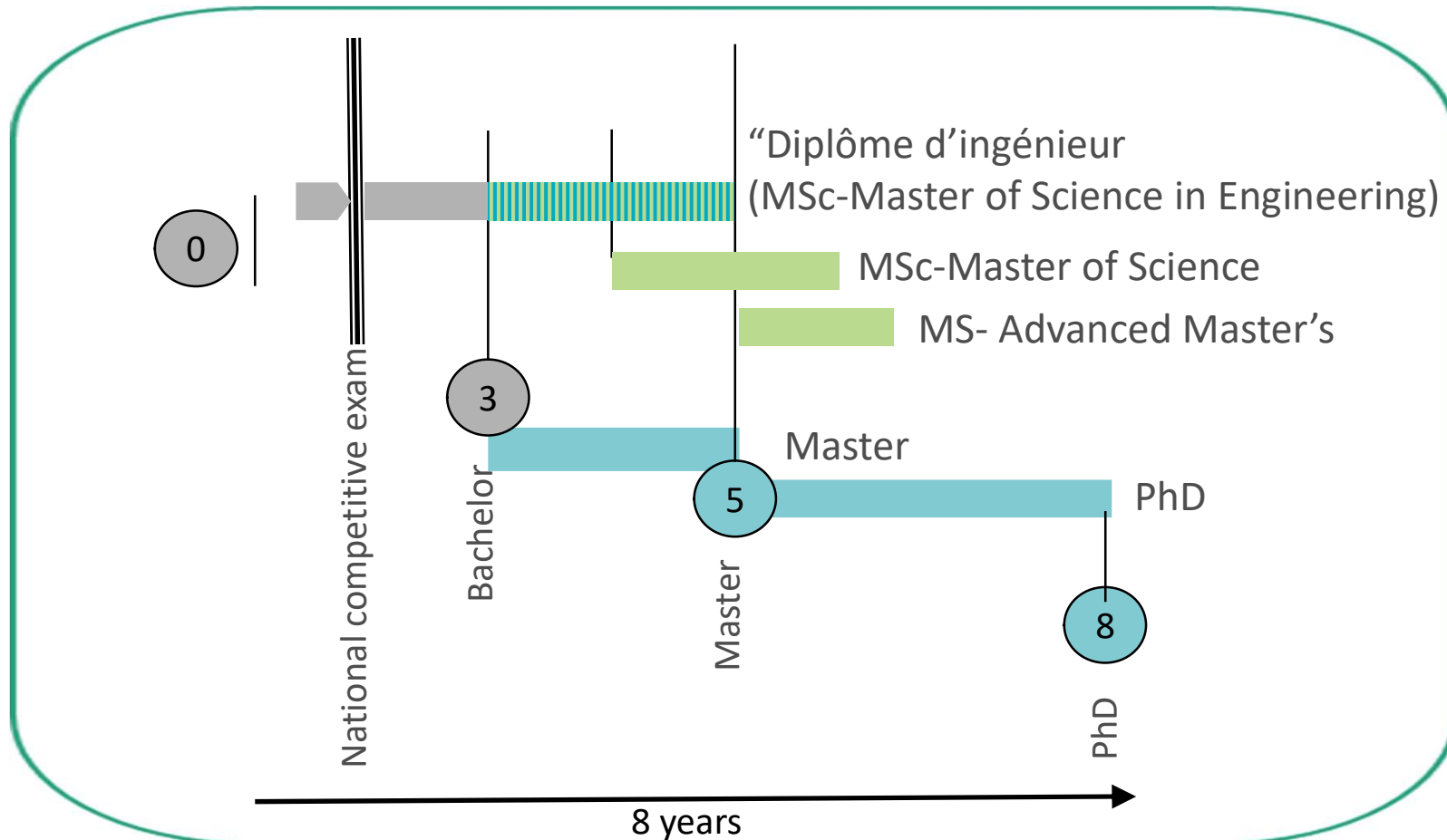
Humanities and Social Sciences

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



École des Ponts
ParisTech

Academics: graduate programs



Industry-oriented
Research-oriented

« 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).





« 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

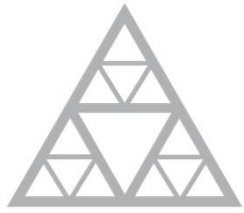


Human-sized classes

35% international

25 nationalities

Bachelor	Master courses (for RU)	Master courses	Master courses	Internship	Master courses	Final project / Master thesis
> Home university		> Ecole des Ponts ParisTech				> Ecole des Ponts or home university



École des Ponts
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International Master's programmes

International masters

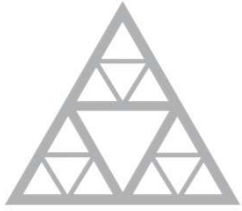
- Masters in Transport and Sustainable Development (TRADD)
- Master in Water, Soil and Waste Management and Treatment (GTESD)
- Master Internacional en Empresa y Políticas Públicas (MIEPP) – institutional degree (Madrid)

UIMP
Universidad Internacional
Menéndez Pelayo



MSc

- Economic Decision and Cost Benefit Analysis (EDCBA)




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Master's programmes

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

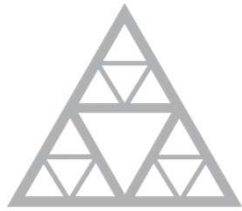
- Transportation, Mobility (TM)

Environmental, Energy, and Transportation Economics

- Environmental Economics
- Energy Economics
- Forward Modelling

Quantitative Economics

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



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Advanced Master's programmes Executive Education

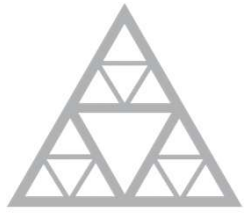


FULL-TIME

- 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

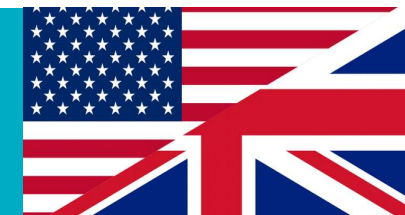


Business Administration programmes

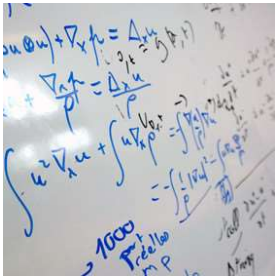



-  • Executive DBA (Paris – New York)
-  • LEADTECH Global Executive MBA (Paris – Barcelona – Singapore – Silicon Valley)
- Global Executive MBA (Casablanca)
- Executive Certificates (Africa)
-  • Executive MBA in aviation management with Tsinghua University (Beijing) 
-   • DBA –Intelligent Manufacturing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

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

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



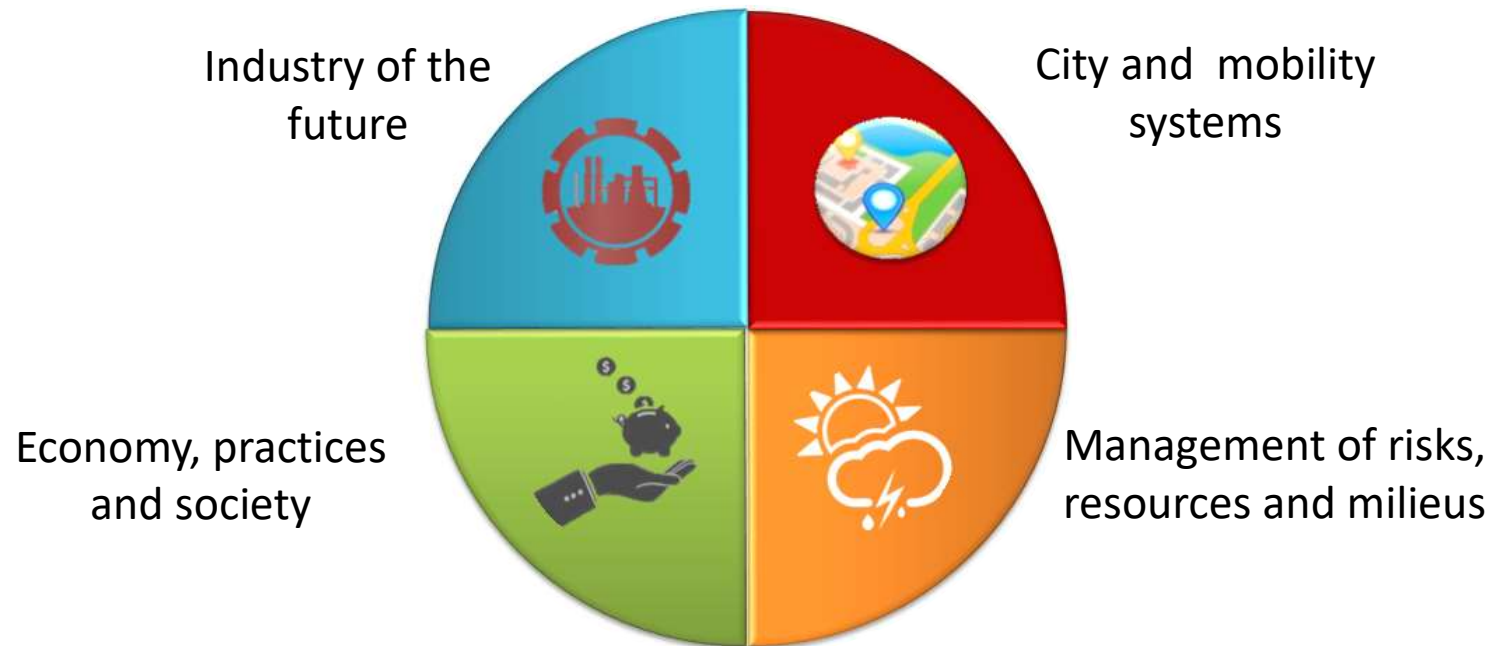
Roof mounted
small wind turbine



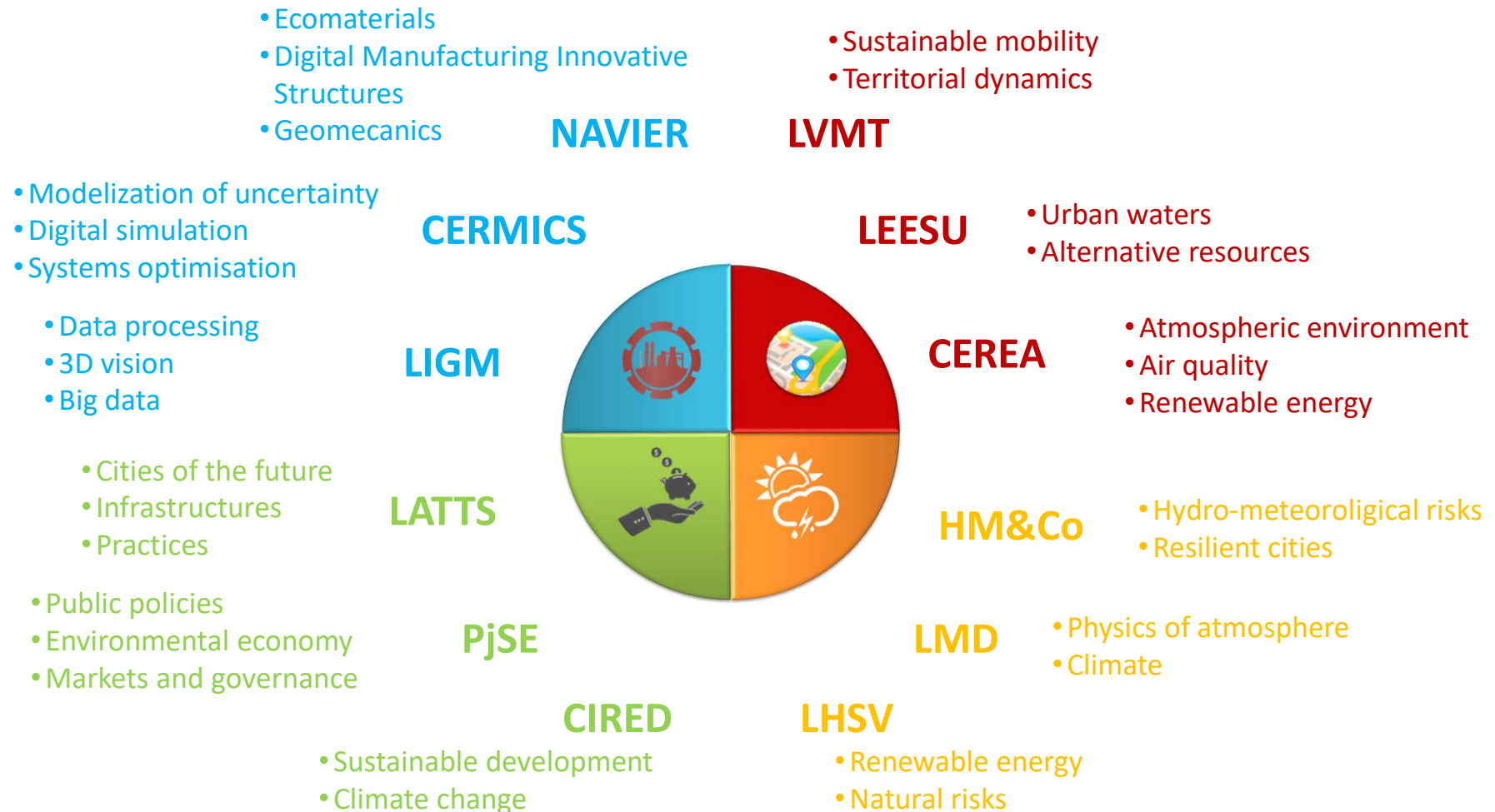
From 2D to 3D

Research for the ecological and digital transition

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



Research for the ecological and digital transition



Research & innovation for the ecological and digital transition

- Predictive Maintenance



➤ Industry 4.0: how to use data to enhance competitiveness



Research & innovation for the ecological and digital transition

- Renewable Energy

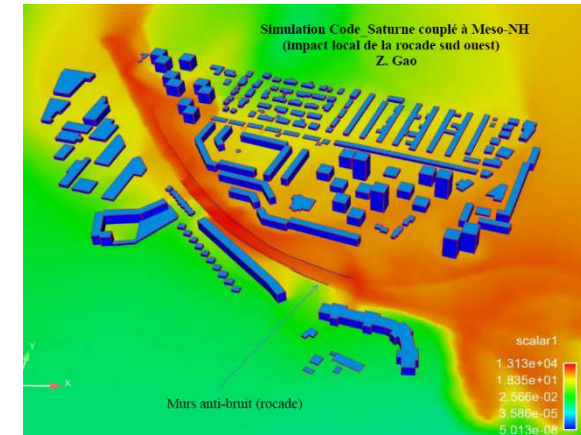


- Onshore and offshore marine energy
- Wind farms and solar
- Smart grids



Research & innovation for the ecological and digital transition

- Resilient Cities: mobility, water, air.



- Smart & Sustainable Mobility



- Extreme rains



- Air Quality



Research & innovation for the ecological and digital transition

- Sustainable buildings and infrastructure

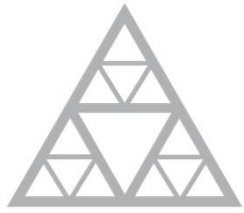


- Ecodesign of buildings and infrastructures

- Materials Science for Sustainable Construction

- Green roof performance





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The Co-Innovation Lab

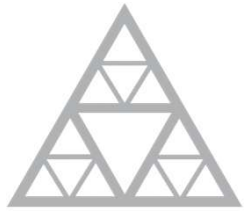
Collaborative platforms improving transfer to industry



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

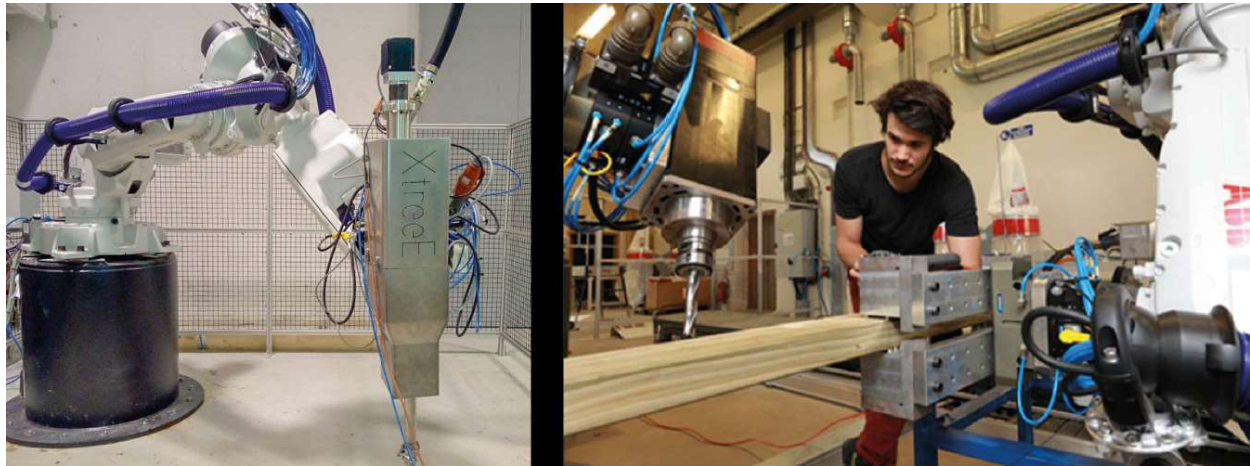
Build'In : building systems and artificial intelligence, materials and structures optimisation, industrial processes
Robotic hall, large-scale additive manufacturing unit, concrete and composite materials modelling
...

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

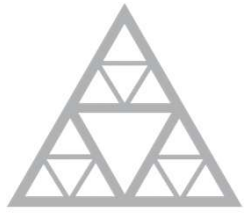
56 CORPORATE
PARTNERS

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

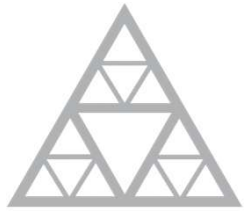
- 220 books and scientific and technical software applications primarily in the fields of civil and structural engineering, and spatial planning

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 »





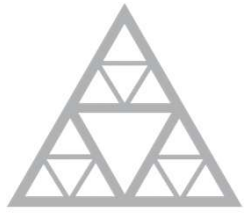
École des Ponts
ParisTech

Alumni endowment and support



Fondation des Ponts

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