A world-class Higher Education and Research Institution

- Founded in 1747
- A unique combination of fundamental and applied sciences for innovation.
- A public engineering school recognized for the excellence of its graduate studies
- A largely internationalized institution
A long history

- **Oldest School of engineering in Europe**
- **1747**: École nationale des ponts et chaussées founded by King Louis XV
- **1851**: First laboratory
- **1988**: 1st Double Degree agreement with international universities
- **1997**: Relocation in Marne-la-Vallée, Green City Campus
- **2013**: New performance energy efficiency building, Coriolis. Paris-Est d.school
- **2017**: Investments for the Future 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
Alumni in industry and in government

Elisabeth Borne
Ponts 86
Minister of the Ecological Transition

François Bertièré
Ponts 74
CEO Bouygues Immobilier

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

Quasar Khanh
Ponts 59
Designer

Antoine Frérot
Ponts 82
CEO Véolia

Mostafa Terrab
Ponts 79
CEO OCP Group

Benoît de Ruffray
Ponts 1993
CEO Eiffage

Thibault Duchemin
Ponts 2013
Founder AVA
Remarkable works, designed by our Alumni

Viaduc Millau - Michel Virlogieux

Beijing Opera © Paul Andreu

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

Cristo Redentor
Albert Caquot
Strong international cooperations
• **International rankings:**
  - Times Higher Education World University Ranking 2019
  - #1 International outlook*
  - #201-250
  - > moved up 50 positions in 1 year
  *: First French school of engineering for the percentage of international students

• QS World University Ranking 2019
  - #263
  - #51-100 by subject Engineering – Civil and structural 2019
A school of excellence

• 85% of our students hired before graduation

• Location:
  • 30 minutes from the center of Paris, France
  • On the Descartes Campus, the largest higher education and research hub in eastern Paris: 15.000 students

• Funding:
  • 50% by the Ministry for the Ecological and Inclusive Transition
  • 50% by industry
Students:
- 850 students in the curriculum of engineering
- 100 in Masters programs
- 350 in Advanced Masters programs
- 550 PhD students & post-doc.
- 150 in MBA programs

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

almost **50%** of foreign students

**1 200** instructors (academics, researchers, business partners)

**12** research laboratories

**420** permanent scientists

**7** labs of excellence

**170** PhD defense / year

**1000** rank A publications, including **35%** with a foreign partner
Our fields of excellence

• **Scientific disciplines:**
  - Mechanics
  - Applied Mathematics
  - Economy

• **Applied domains:**
  - Civil and environmental engineering
  - Urban planning and Transport
  - Mechanical engineering
  - Finance, management, operations
  - Data sciences
Academic programs

“Diplôme d’ingénieur (Master of Science in Engineering)

MSc - Master of science

MS - Specialised Masters

Masters of Science

PhD *

0

National competitive exam

3

Bachelor

5

Master

8

PhD*

Industry-oriented

Research-oriented

8 years

* Awarded by Université Paris-Est
Engineering tracks

• **Civil Engineering and Construction:**
  Complex projects, site work organization, innovation of new materials and construction technologies

• **Urban planning, Transportation and Environment:**
  Planification of complex urban systems and operation of urban services (transportation, water,...)

• **Mechanical Engineering and Materials:**
  Research and design of new products and materials in the fields of energy or transportation

• **Industrial Engineering:**
  Innovation and supply chain

• **Economics Sciences and Finance:**
  Financial engineers (financial engineering, project finance, public/private partnerships) and economist engineers (urban, environment, transportation, construction and economic regulation)

• **Mathematical Engineering and Informatics:**
  Modelisation of complex systems; analysis of financial, industrial or natural risks; challenges within big data
6 departments of studies

Civil engineering and construction

Urban planning, transport and environment

Mechanical engineering and material sciences

Industrial engineering

Economy, Finance, Management

Applied mathematics and computer science
Research-oriented Masters programs

- **International Masters:**
  - Transport and Sustainable Development (Renault Foundation)
  - Water, soils and waste management
  - Mobility and electric vehicles

- **Research Masters (M2):**
  - **Applied Mathematics**
    - Applied Mathematics for Finance
    - Mathematics, Vision, Machine Learning
    - Numerical Analysis and Partial Differential Equations

  - Nuclear Energy, Decommissioning and Waste Management (English)

  - **Mechanics**
    - Multi-scale Approaches for Materials and Structures

  - **Civil Engineering**
    - Mechanics of Soils, Rocks and Structures

  - **Material Engineering and Sciences**
    - Material Science for Sustainable Construction

  - **Transport, Mobility, Infrastructures**
    - Transport, Mobility

  - **Environmental, Energy, Transport Economy**
    - Environmental Economy
    - Energy Economics
    - Prospective Modelisation

  - **Environmental Science and Engineering**
    - Water Systems and Water Management
    - Ocean, Atmosphere, Climate and Space

  - **Quantitative Economics**
    - Analysis and Political Economy
    - Public Policy and Development
Industry-oriented masters programs

- **Civil Engineering**
  - European civil engineering
  - Civil engineering for large energy structures

- **Transports and Logistics**
  - Management and Engineering of Logistics Systems
  - Railway & urban transport systems
  - Supply chain design & management (English)
  - Smart Mobility (English)

- **Public Action**
  - Public policy for sustainable development
  - Master Internacional Empresas y Politicas Publicas (Spanish)

- **Finance**
  - Infrastructure Project Finance (English)
  - Economic Decision and Cost Benefit Analysis (English)

- **Building**
  - Real estate, buildings, energy
  - Design by Data (English)
  - BIM, integrated design & life-cycle of buildings and infrastructures

- **City and Urban Development**
  - Urban planning & development
  - Urban engineering & information technologies (English)
  - Smart Cities engineering (English)
  - Transport and Urban Development for Africa
PhD programs

- **Doctoral schools:**
  - Sciences, Engineering and Environment
  - Planning, transport, territories
  - Mathematics, Information, Communication Sciences and Techniques
  - Organization, markets, institutions
Challenge-based Research

• Contributing to 4 socio-economic challenges of sustainable development

- Resources, Environment, and Risks Management
- Economy, Behavior, and Society
- Urban Systems, and Mobility
- Industry of the Future
12 research laboratories

- 4 Disciplinary pillars
  - Mathematics & Computer science
  - Mechanic engineering & Material science
  - Environmental science
  - Economic & Social sciences

- Developing a comprehensive, interdisciplinary approach
**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, disdrometers...*

**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...*

**Mµ**: urban mobility modelling, new behaviours, infrastructures and urban planning, impact of public policies
*Softwares, traffic simulators...*

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**Key figures**

- 12 labs
- 225 researchers
- 500 PhD students
- TRL 5-9
- Business Club with large companies, SMEs and startups
Innovation and entrepreneurial mindset

• Young and dynamic alumni entrepreneurs

- Expliseat
  Ultra-light aircraft seats

- ECHY
  Daylight system with fiber optic

- Acute3D
  From 2D to 3D

• D.school Paris

• 3 start-up incubators:
  • GreenTech Verte
  • Descartes +
  • Station F
The green cluster – East Paris
Cité Descartes
Thank you