

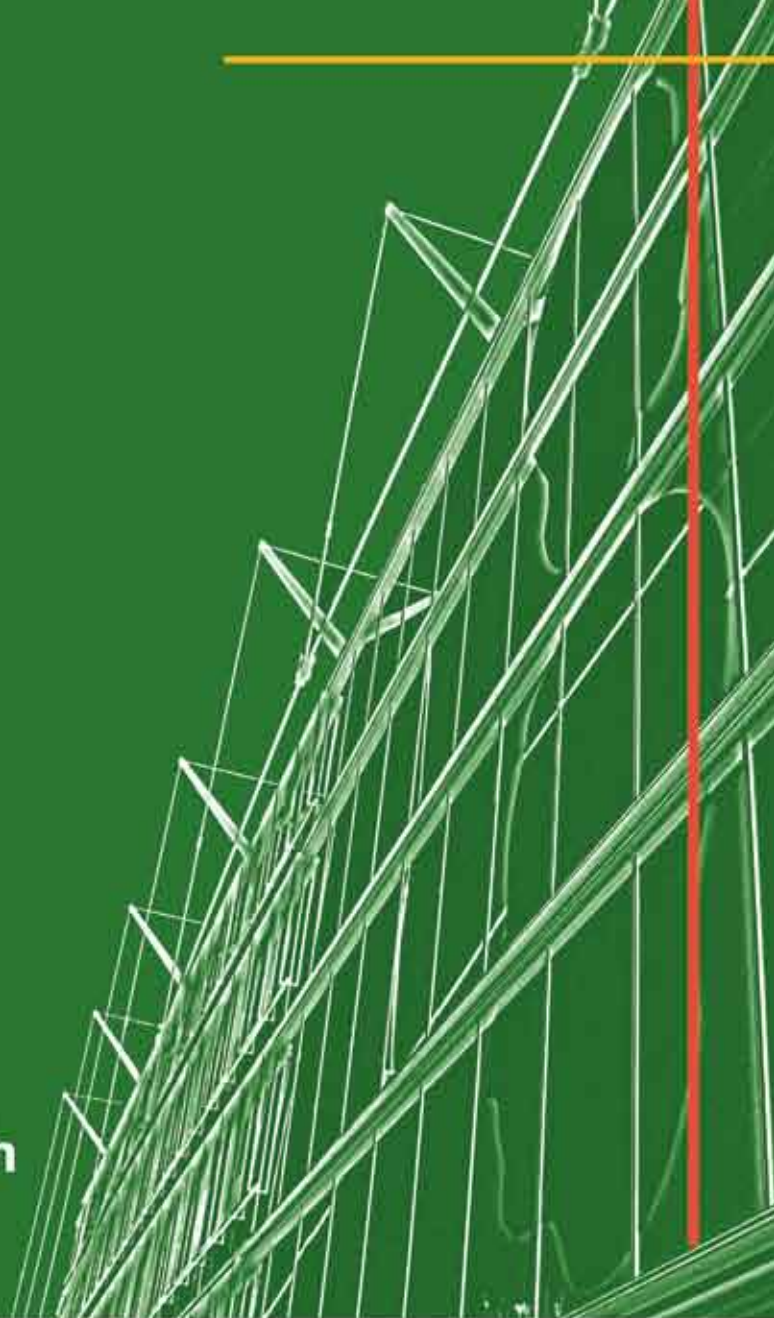


École des Ponts  
ParisTech

# Activity Report

## École des Ponts ParisTech

### 2012



UNIVERSITÉ  
— PARIS-EST



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## A word from the Director



A performance contract has been drawn up and signed with the Ministry of the Environment, Sustainable Development, Transport and Housing, and is binding on the School until 2014. It sets 3 strategic objectives for our School:

- academic excellence in both research and teaching;
- the training of engineers aware of the need to reconcile environmental protection and improvement, economic development and social progress, with the capacity to make significant contributions to these 3 pillars of sustainable development;
- the contribution to the construction of an academic hub in the Paris region with a global reputation, in particular on matters of “the city, the environment and their engineering”.

The year 2012 was also marked by the success of our research labs in calls for high-quality projects under the Future Investments Programme. As a result, all the School’s laboratories with an A or A+ rating, i.e. 10 of its 11 labs, have been awarded (LabEx – Excellence Laboratories) label. This means that the quality of the School’s research, in particular at Paris-East University and the Paris School of Economics, has been recognised by the international juries for this Programme. The list of prizes, distinctions and appointments once again awarded to our researchers this year, confirms this high level of excellence.

Construction work has now finished on the Coriolis and Bienvenüe buildings, which are scheduled for use from summer 2013.

The Coriolis building, owned by École des Ponts ParisTech, is the outcome of a successful partnership with Université Paris-Est, Académie de Créteil, MEDDE, the Île-de-France Region, CSTB and Epamarne. These new, efficient and environmentally friendly facilities are now home to a number of École des Ponts ParisTech’s teaching and research teams. A dozen laboratories, organisations and teaching groups there will be able to focus on their projects in a positive energy building with international scope.

As for the Bienvenüe centre, owned by MEDDE, it will house IFSTAR as well as research units from École des Ponts ParisTech, CSTB, the urban planning institutes (IFU and IUP) and Université Paris-Est. These 2 structures will introduce a new dynamic into the relations between the research and teaching forces, forming a world-class centre of excellence for the Sustainable City.

On the education side, the signature of a double-degree agreement with HEC Paris offers engineering students new possibilities and broadens our recruitment base. The establishment of the accreditation documents for the issue of engineering degrees and the audit by the Engineering Qualifications Committee (CTI) was a key moment of the past year; the CTI had the opportunity to meet some of you and appreciate the strength of our graduate network. The “Excellence Initiative for Innovative Education” label awarded to the “design school”, christened “d.school Paris-Est at École des Ponts”, with funding of €4.1 million, crowns the work undertaken by the Industrial Engineering Department within the framework of the breakthrough innovation course, in partnership with Stanford University.

Two new Specialist Masters programmes headed by the School were introduced:

- with AgroParisTech on public sustainable development policies,
- with CSTB and CNFTP on real estate, construction and energy.

The School continues to pursue a highly dynamic international policy with the renewal of several agreements with foreign universities and the signature of a new double-degree agreement with the Novosibirsk State University in Russia, bringing the total number of these agreements to 32.

Armel de la Bourdonnaye

# Governance and organisation

## Organisation Chart

At 7 February 2014

### Fondation des Ponts

Chairman :  
N.

### Ponts Alliance

Chairman:  
Michèle CYNA

### Board of Directors

Chairman:  
Jacques TAVERNIER

### Scientific Council

Chairman:  
Bernard  
LARROUTUROU

### Director of the School

Armel de la BOURDONNAYE  
Deputy Director:  
Gilles ROBIN

### Accounts Agency

Nelly TOCKO

### Education Department

Richard THUMMEL  
Deputy Director:  
Victor GÓMEZ FRÍAS

### Research Department

Serge PIPERNO  
Deputy Director:  
Geneviève JESTIN

### Lifelong Learning Department

Bruno BIEDER  
Chairman of the Ponts  
Formation Conseil  
Supervisory  
Committee

### Documentation, Archives and Heritage Department

Isabelle GAUTHERON  
Dep.: Gaëtan TRÖGER  
**Archive Assistant**  
Anne LACOURT

### Central Secretariat

Xavier GUÉRIN  
Dep.: Claude KREMER

### Internships and Careers

Valérie JOLY

### Resources and Student Life

Éric BLANCHI

### Masters

Jacques GRANDJEAN

### Pedagogy

Jean-Yves POITRAT

### Admission - Tuition Section

Évelyne THIECHART

### Sustainable Development Manager

Émeric FORTIN

### Work Experience and Inclusion Section

Hassane AKKA

### Information Systems Section

Jorge QUEIXALOS

### UNIVERSITÉ PARIS-EST

### Doctoral Studies Department

Bernard LAPEYRE  
Dep. : Elisabeth BEYLS

### Science, Engineering and Environment DS

Denis DUHAMEL  
(École des Ponts  
ParisTech)

### Mathematics and ICT DS

Djalil CHAFAI  
(UPEMLV)

### ED City, Transport and Territories DS

Sylvy JAGLIN  
(UPEMLV)

### PONTS FORMATION CONSEIL SUBSIDIARY

### Business Unit Director (Civil Engineering, Planning, Real Estate and Building, Environment):

Hélène SKOUTARIDES

### Business Unit Director (Roads, Infrastructures, Transport, Management):

Patricia ARINJAKA

### Financial and Administrative Manager:

Brigitte FRANCK

### HR Manager:

N.

### IT Manager:

Brigitte MAUGER

### Pedagogical Resources and LESAGE Library Scientific and Technical Information

Florence RIEU-LECERF

### Heritage

Catherine MASTEAU

### Documentary Information System

Johanna DESCHER

### Human Resources

Anthony BASS

### Budgetary and Financial Affairs

Magali DECHANET

### Property and General Resources Affairs

Claude KREMER

### Central Procurement and Purchasing Department

Cédric DELEPINE

### Preventive Medicine Centre

Docteur Clarisse LOYER

### Quality Department

Laurent PETIT

### International Relations Department

Pierre MICHAUX

### Director of Strategy

Corinne DEGOUTTE

### Development Department

Bernard GAMBINI

### Communications Department

Emmanuelle DELFORGE  
Dep. : Karima CHELBI

### Information Systems Department

Harry WILLIOT  
Dep.: S. LHULLIER

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## The School's Teaching Faculties

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### 1st Year

Alain MARUANI  
Academic Dir.:  
Victor GOMEZ FRIAS

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### Language Training (DFL)

Jörg ESCHENAUER  
Dep.: Thomas HARCHARICK

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### Human and Social Sciences (SHS)

Gilles CRAGUE

---

### Civil Engineering and Construction (GCC)

Bernard VAUDEVILLE  
Academic Dir.:  
Sébastien GERVILLERS

---

### Mechanical Engineering and Materials (GMM)

Alain EHRLACHER  
Academic Supervisor:  
Frédéric TAYEB

---

### Mathematical Engineering and IT (IMI)

Éric DUCEAU  
Academic Supervisor:  
Mohammed EL RHABI

---

### Industrial Engineering (GI)

Fabrice BONNEAU  
Academic Supervisor:  
Aurélie DELEMARLE

---

### City, Environment, Transport (VET)

Pierre SALLENAVE  
Academic Supervisor:  
Joachim BROOMBERG

---

### Economics, Management, Finance (SEGF)

Dominique JACQUET  
Academic Supervisor:  
AbdelKader SLIFI

---

## ENPC MBA Paris

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### MIB Board

Board Vice-Dean: Alon ROZEN

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### PARIS-EST d.school Dean

Véronique HILLEN

---

## The School's laboratories

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### Atmospheric Environment Teaching and Research Centre (CEREA)

Dir. : Christian SEIGNEUR

---

### Centre for Teaching and Research on Mathematics and Scientific Calculus (CERMICS)

Dir. : Jean-François DELMAS

---

### International Centre for Research on the Environment and Development (CIRED)

Dir. : Franck LECOQ

---

### Techniques, Territories and Societies Laboratory (LATTS)

Dir. : Olivier COUTARD

---

### Water, Environment, Urban Systems Laboratory (LEESU)

Dir. : Bruno TASSIN

---

### Gaspard Monge Computer Science Laboratory (LIGM)

Dir. : Marie-Pierre BÉAL

---

### Dynamic Meteorology Laboratory (LMD)

Dir. : Vincent CASSÉ

---

### City, Mobility, Transport Laboratory (LVMT)

Dir. : Pierre ZEMBRI

---

### Paris-Jourdan Economics (PSE)

Dir. : Pierre-Yves GEOFFARD

---

### Saint-Venant Hydraulics Laboratory

Dir. : Michel BENOIT

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### Navier Laboratory

Dir. : Karam SAB



# School Council

February 7, 2014

## Chairman of the School Council

### Jacques Tavernier

Chairman and CEO of Eurovia

## Ex officio members

### Patrice Parisé

interim deputy chairman of MEDDE (general council for environment and sustainable development)

## Board members

### N.

Vice President of CGEDD

### Vincent Mazauric

Secretary General of the Ministry of Infrastructure

### Laurent Tapadinhas

Director for Research at the Ministry of Infrastructure

### Alain Bernard

representing the Director of Higher Education at the Ministry of Higher Education

### Frédéric Getton

representing the Director for Research at the Ministry of Research

### Laurent Machureau

representing the Budget

## Qualified individuals

### Diane D'Arras

Deputy Director Eau Europe Suez Environnement

### N.

### Muriel Jougleux

University Professor, Deputy-Chairman of the Paris-Est Marne-la-Vallée University Council

### Gerhard Müller

Dean of the Civil Engineering Faculty of Munich Technical University

### Florence Parly

Executive Vice President Air France - Passenger Activity Paris-Orly and French Stations

### Fouad Awada

Deputy CEO of the Île-de-France Region's Development and Planning Institute

## School Alumni Association

### Jean-Marc Charoud

Director of Engineering Department, RATP

### Fouad Awada

président de Ponts Alliance

## Teachers' representatives

### Alain Ehlacher

substitute: Jean-François Caron  
Chairman of the Mechanical Engineering and Materials Department

### Eric Cances

substitute: Alexandre Ern  
teacher, researcher CERMICS

### Fabien Laurent

substitute: Frédéric de Coninck  
Professor, Assistant Researcher LVMT

## Representatives of other teachers and researchers

### Amina Alaoui-Soulimani

substitute: Adélaïde Feraille  
researcher Laboratoire Navier

### Nathalie Roseau

substitute: Karine Sartelet  
researcher LATTs

### Jean-Michel Pereira

substitute: Sébastien Brisard  
researcher laboratoire Navier

## Student Representatives

### Mathieu Bailly

substitute: Thibault Daval (year 2)  
engineering student

### Vianney Beruf

substitute: Axel Parmentier (FCI)  
engineering student

### Robin Waldman

substitute: Mohamed Toujani (Masters student)  
Masters student

## Representing administrative and technical staff

### Armelle Fayol

substitute: Brigitte Millard  
accounts manager Laboratoire Navier

# Scientific Council

as at 1 April 2013

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## **Bernard Larrouturou**

Chairman

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## **Sigrid Adriaenssens**

Professor at Princeton University

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## **Hervé Charrue**

Director of R&D at CSTB (Scientific and Technical Centre for Construction)

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## **Pascale Delecluse**

Deputy Director of Research at Météo-France

---

## **Maria J. Esteban**

Director of Research at CNRS (National Scientific Research Centre) and at Paris-Dauphine University

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## **Filip C. Filippou**

Professor at the University of California, Berkeley

---

## **Luc Hittinger**

Deputy-Chairman of Paris XII University Scientific Council

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## **Cyril Kao**

Deputy Scientific Director of AgroParisTech

---

## **Vincent Kaufmann**

Professor at EPFL (Swiss Federal Institute of Technology in Lausanne)

---

## **Corinne Larrue**

Professor at François-Rabelais University, Tours

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## **Sophie Le Bourva**

Deputy Director of the firm ARUP

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## **Philippe Martin**

Professor at Sciences Po (Paris Institute of Political Science)

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## **Maria Nadia Postorino**

Professor of Transport at "Mediterranea" University of Reggio Calabria - Engineering Faculty

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## **Laurence Rouil**

Head of the "Modelling and economic analysis for risk management" unit at INERIS (National Industrial Environment and Risks Institute)

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## **Sarah Springman**

Professor at ETH Zurich

---

## **Bernard Tardieu**

Expert - Honorary President of Coyne and Bellier - Member of the Executive Council of VELCAN

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## **Monique Thonnat**

Research Director, EPI PULSAR head at INRIA (National Institute of Computer Science and Automation Research)

---

## **Henri Van Damme**

Professor at ESPCI (Higher School of Industrial Physics and Chemistry)

---

## **Daniel Villessot**

Scientific Director at Lyonnaise des Eaux

---

## **Pierre-Louis Viollet**

Coordination and Partnerships Director at EDF R&D



# Teaching and Research Council

as at 27 November 2012

The Teaching and Research Council (CER), headed by the Director of the School, comprises an equal number of members of the School's management, representatives of the teaching and research structures and student representatives.

It has 24 members:

## - 8 representatives of the School's management:

Armel de La Bourdonnaye, Director of the School  
Gilles Robin, Deputy Director  
Richard Thummel, Director of Education  
Serge Piperno, Director of Research  
Alain Ehrlacher, Chairman of the GMM Department  
Frédéric de Coninck, Deputy Director of LVMT  
Jean-François Delmas, Director of CERMICS  
Alain Maruani, Chairman of the 1<sup>st</sup> Year Department

## - 8 representatives of the teaching and research body:

Michel Nakhla  
Gilles Foret (substitute Jean-François Caron)  
Sébastien Brisard (substitute Jean-Michel Pereira)  
Thomas Harcharick (substitute John Gedge)  
Adélaïde Feraille (substitute Amina Aloui-Soulimani)  
François Chevoir (substitute Anaël Lemaitre)

*Two member positions and 3 substitute positions remain to be filled.*

## - 8 elected student representatives:

Mathieu Bailly (Y1)  
Clément Renault (Y2)  
Louise Bernard (Y2)  
Gustavo Rodvalho Boriolo (DD)  
Jérôme Saint-Cast (MS PAPDD)  
Carl Soutra (MS Ferr)  
Julie Chretien (PhD researcher)

*One member position and one substitute position remain vacant.*

# Research valorisation and relations with industry

2012: corporate involvement for societal ends

**École des Ponts ParisTech** is continuing its efforts to form long-term partnerships with different sectors of the economy and to use its education and research to enhance business competitiveness.

## Research in partnership with companies, public bodies and local authorities:

Most of the School's laboratories are mixed research units (UMR) with public partners; two are in partnership with EDF: the Centre for Teaching and Research on the Atmospheric Environment (CEREA), and the Saint-Venant Hydraulics Laboratory (jointly with CETMEF).

**Revenues from research partnership agreements are rising steadily** year-on-year, reflecting the dynamism of the School's research activity and the efforts undertaken to develop high-quality research under contract, whether with private companies, public bodies or local authorities.

École des Ponts ParisTech's commitment to the corporate world is also illustrated through its participation in the **AdvanCity - sustainable city and mobility** competitiveness cluster. The cluster has restructured its activity to pursue 4 priorities: "EcoVille", "EcoConstruction", "EcoMobilité", and "EcoTechnologies", in particular to encourage and support partnership research projects in response to calls for projects by FUI, FEDER or ADEME.

## Teaching and research chairs

There are several teaching and research chairs which form the basis for a long-term relationship connected with a specific topic on which the partner company wishes to sponsor the activities of the School.

**The chair in "Materials Sciences for Sustainable Construction"** in partnership with Lafarge, established in 2007 and extended in 2011 for a further 5 years, within a partnership that also includes a significant contractual research component.

**The chair in "Financial Risks"** in partnership with the Risk Foundation and its founder Société Générale, along with École Polytechnique and Pierre and Marie Curie University, which was extended in 2012 for a further five year period.

**The Saint-Venant chair in "Fluid Mechanics Applied to Hydraulics and the Environment"** in partnership with EDF.

**The chair in "Sustainability of Energy Materials and Structures"** in partnership with the European Foundation for Tomorrow's Energies and its founder EDF, along with GDF SUEZ, GRT Gaz, and MINES ParisTech.

**The chair in "Eco-Design of Buildings and Infrastructures"** in partnership with Vinci, Mines ParisTech and AgroParisTech.

**The chair in "Forward Modelling for Sustainable Development"** in partnership with EDF, Total, Renault, Schneider Electric, ADEME and MINES ParisTech.

**The chair in "CO<sub>2</sub> Capture, Transport and Storage"** in partnership with Air Liquide, EDF, GDF SUEZ, Lafarge, Le Havre City and District, Grand Port du Havre, Total, MINES ParisTech, Le Havre University and BRGM.

**The Chair in "Socio-Economics and Modelling of Urban Public Passenger Transport"** in partnership with STIF (Île-de-France Transport Federation).

**The chair in "Hydrology for a Resilient City"** in partnership with VEOLIA.

**The chair in "Building Sustainably and Innovating"** in partnership with Bouygues Construction, CSTB (scientific and technical centre for construction), Supélec and École Centrale Paris

**The chair in "Innovative Solutions for a Sustainable and Responsible Habitat"** in partnership with Saint-Gobain.

**The chair in "Transport Infrastructure Management"** in partnership with Abertis and IFSTTAR (French Institute for Transport, Planning and Infrastructure Sciences and Technologies).

**The "City"** chair in partnership with the French Development Agency (AFD), GDF SUEZ and SUEZ ENVIRONNEMENT.

**The chair in "Reinventing Stations in the 21st Century"** in partnership with SNCF – Gares & Connexions.

**The chair in "Rail Transport Sciences"** in partnership with Eurotunnel.

Corporate sponsorship by Thalès, EADS, Angenieux and GDF SUEZ has also gone to support the Industrial Engineering Department's "Design Thinking" course.

## Applications:

In 2012, the School possessed a portfolio of patents and software comprising:

### Patents:

- a flat anchoring system, of particular use in civil engineering,
- a wood-concrete load-bearing structure, jointly owned with IFSTTAR,
- capacitive micromachined ultrasonic transducer (CMUT) cell formed from a nano-tube membrane, nano-wires or nano-beams and an ultrahigh frequency acoustic imaging system containing multiple cells of this kind,
- a process and system for acoustic analysis of micropores in a material such as concrete, using multiple CMUT transducers incorporated into the material...

### Software:

- software for the Polyphemus platform used to simulate air quality, partly joint owned with EDF,
- Geodesic Connectivity Mapping software, a logarithm for estimating anatomical connectivity in the brain,
- IMAGINE VMS software, an algorithm for 3-D representation from photos, jointly owned with CSTB,
- NSP software to facilitate access to multiple e-libraries and to summon external functions interactively,
- LADTA TOOL KIT software for the dynamic computation of the distribution of vehicle flows on a very large network.

### Company creation:

The School is a partner in the Descartes business incubator (campus incubator) and in Agoranov (ParisTech incubator). It is directly involved in supporting the firm acute3D, set up in 2011 by 2 former researchers at the School. In 2012, Acute3D successfully grew its business, capitalising on a grant of exclusivity for use of the IMAGINE VMS software. The School is also directly backing the firm ECHY, set up by a student in late 2012, on a project for the use of optical fibres to channel sunlight. This project has developed successfully with the support of the Mechanical Engineering and Materials Science Department.

## **Education that is evolving to adapt to the needs of society and businesses:**

In 2012, the School continued to implement its project-based teaching approach, responding to the problems of industry, notably with large-scale projects involving a group of students for almost a full semester. It also reinforced its training for innovation through an awareness-raising module for all Year 2 students and the creation of specific teaching programmes. The School was also the sponsor of “Paris-Est d.School at École des Ponts” and its framework of classes focusing on innovation through design thinking, a project awarded the “Excellence Initiative for Innovative Education” label under the Future Investments Programme.

To meet the needs of professional communities and with their support, the School:

- renewed the partnership for the Specialist Masters degree in “Rail and Urban Transport Systems”,
- and inaugurated the Specialist Masters degree in “Real Estate, Building, Energy” created with CSTB in partnership with Saint-Gobain, Dalkia, Rabot Dutilleul, Logement Français and Crédit Agricole Immobilier.

There is substantial corporate participation in teaching programmes and internships. Notable examples are the relations with SNCF, Vinci, Eiffage, Bouygues, SUEZ ENVIRONNEMENT, LVMH, EDF...

Finally, to facilitate the task of companies in advertising their activities and job opportunities to students, a “Career Focus” partnership has been set up in association with the Student Office. 17 companies have joined this structured system, which is based around lectures, a forum and company visits.

### **Partners provide significant support through the Lifelong Learning Tax.**

Almost 400 companies have allocated part of their 2012 Lifelong Learning Tax to the School, representing a total of €1 million. This allocation makes a vital contribution to the development of the course offering and of a project-based syllabus.

### **Main recruiters (source: survey of 2012 graduates):**

Vinci, Egis, EDF, Areva...

École des Ponts ParisTech would like to thank the partners who supported it in its education and research activities in 2012 and who contributed to its development.

The School's **long-term** partners, in particular those contributing through teaching and research chairs or specialist courses, are:

ABERTIS  
ADEME  
AFD  
AIR LIQUIDE  
ALSTOM  
ANSALDO/STS  
BOSTON CONSULTING GROUP  
BOMBARDIER  
BOUYGUES CONSTRUCTION  
COLAS  
EDF  
GDF SUEZ  
GRAND PORT MARITIME DU HAVRE  
LAFARGE  
RATP  
RENAULT  
RFF  
SAINT GOBAIN  
SCHNEIDER ELECTRIC  
SIEMENS  
SNCF  
SOCIÉTÉ GÉNÉRALE  
STIF  
SUEZ ENVIRONNEMENT  
THALES  
TOTAL  
VEOLIA  
VILLE DU HAVRE and COMMUNAUTE D'AGGLOMÉRATION HAVRAISE  
VINCI

**Others that provided significant support to the School in 2012: lifelong learning tax, partnership-based research, student sponsorship, educational contribution, internships, ongoing training:**

#### COMPANIES

ACCENTURE  
AEROPORT DE PARIS  
ANGENIEUX  
AIR FRANCE  
AREVA  
ARTELIA  
BANQUE DE France  
BNP BARIBAS  
BUREAU VERITAS  
CANAL PLUS  
CAPGEMINI  
CASINO  
CDC  
CREDIT AGRICOLE IMMOBILIER  
CURISTEC  
DALKIA  
EIFFAGE  
EGIS  
HSBC FRANCE  
INGEROP  
KEOLIS  
LA POSTE  
LEON GROSSE  
LVMH  
LOGEMENT Français  
MEDIACO  
MCKINSEY  
MICHELIN  
MONOPRIX  
NATIXIS  
PANASONIC  
RABOT DUTILLEUL  
REGIENOV  
SCET

#### PUBLIC BODIES

ANDRA  
CEA  
CETMEF  
CSTB  
EURYDICE GIE  
IFSTAR  
MEDDE  
MESR  
ONR  
RÉGION ÎLE-DE-FRANCE  
SIAAP

Some 400 other companies and organisations supported the School's activities over the year.

# Sustainable development – core of the School's strategy

Resilient towns and cities, carbon finance, microcredit, electric vehicles, corporate social responsibility..., the sustainable development of our societies generates a multitude of challenges. The duty of a leading engineering school is to tackle these challenges through its research activities but also through the training of future engineers/managers capable of employing their talent and creativity to provide relevant solutions and implement them in collaboration with stakeholders.

Through its specific fields of research and education (transport, urbanism, materials, energy, environment, sectoral economics...), École des Ponts ParisTech has long sought to provide the instruments needed to respond to these challenges, which are far from confined to environmental impact alone. It has chosen to follow a systemic, multidisciplinary, scientific and open approach as the backbone of the development of its education and research. The School's strategy since the 1990s has thus been entirely consistent with its sponsoring ministry in its **inclusion of societal issues**: dialogue with stakeholders, making acceptability a central tenet of sustainability, helping to develop methods of governance.

## Building expertise on sustainable development: research at École des Ponts ParisTech

The purpose of research at École des Ponts ParisTech has long been to develop multidisciplinary expertise on complex projects and systems in which engineering, economics, social sciences and public action coincide. Indeed, the School's traditional fields of excellence combine engineering sciences such as mechanical engineering, materials or mathematics, and economic

or social sciences, to tackle a very broad range of issues: environmental engineering; sustainable mobility; growth and the environment; risk and uncertainty management; materials engineering to reduce environmental impact and multiscale problems. Inevitably this approach has placed the School's laboratories at the cutting edge of research on the issues at the heart of sustainability.

Building a strong scientific base, which companies can rely on to grow in a sustainable fashion, entails developing strong expertise in disciplines such as environmental and materials engineering, civil engineering for construction, economics, management and political science. It also implies developing multidisciplinary approaches to the analysis of the interactions between the different facets of sustainability, in order to understand the connection between the different scales of time and space, so that any action is embedded within a context of social acceptability.

The School thus houses two types of laboratory: single-discipline laboratories for the development of specific expertise in one of the aspects of sustainability, and multidisciplinary laboratories that place such sustainability at the heart of their strategy. This dynamic is naturally reinforced by the construction of a major, international-scale research hub on the sustainable city within Université Paris-Est: with the entry of IFSTTAR, of a CSTB team, of IFU, of IUP, with the merger with EIVP, ESTP and two Parisian architecture schools...

## Training future decision-makers on sustainability: The major purpose of education at École des Ponts ParisTech



In the context of its discussions about the core skills of engineers at École des Ponts ParisTech, the Education Department has developed ideas on training for sustainable development. At the instigation of the Department's sustainable development officer, an assessment grid was constructed for the courses provided by the School to all its engineering students. This pioneering approach established a list of the learning outcomes that the School wishes to emerge from its training in sustainable development. On this basis, in 2012 the education departments conducted a self-assessment on the courses they were providing. This identified the School's strengths, but also areas for improvement and those requiring a complete overhaul. Following this stocktaking exercise, the Board of Directors looked at a series of scenarios to decide on the extent to which sustainable development should be incorporated into courses and to set the appropriate strategy.

Beyond the need to raise awareness on the three components of sustainable development (societal, environmental and economic) and to provide training on the concepts and methods required to measure and reduce the environmental impact of human activities, the driving force of the evolution in the School's education is a far deeper understanding of the challenge that sustainable development poses in terms of governance. Methods of governance consistent with sustainable development, whether in private companies or in public decision-making, will only emerge if the agents of societal transformation, the graduates and future graduates of École des Ponts ParisTech, are capable:

- of understanding the real issues of the projects on which they work. To do this, they should obviously employ the analytical tools they possess, but above all they need to establish methods for consulting and informing stakeholders, indispensable conditions for the acceptability and therefore the sustainability of any solutions proposed. They therefore need to be able to master the tools of public debate and include (if not initiate) scientific discussion in their ideas and their choices. Their training must also teach them to employ qualitative approaches when the quantitative is not sufficient or appropriate;
- of consistently incorporating the different cognitive and strategic dimensions of these issues and understanding how the various temporal and spatial scales associated with their projects are connected. To do this, they need to employ the tools of territorial analysis which are a strong component of the School's training. They must also be able to identify the irreversible outcomes arising from projects and connect project-specific scales with the scales of the agents who manage them;
- of employing technical, economic and managerial tools in a connected, synchronous and consistent way and devising new instruments in order to respond appropriately to the issues of sustainability;

- of having a dynamic understanding of the problems in order to offer solutions capable of adapting to changes in societal preferences and to all the uncertainties inherent in the unfolding of a project over time. The School's graduates will thus be the agents of a major shift in decision-making processes by achieving acceptance through methods that ensure not maximum medium-term effectiveness but optimum robustness in relation to the uncertainties associated with factors that cannot reasonably be controlled, or even have not yet been (fully) identified.

So the School's task is not only to train people specifically for environment-related careers or to incorporate an environmental dimension into all its activities, but rather to ensure that sustainability is consistently present in all sectors. This is achieved by an education that offers:

- specific modules targeting one or more of the above-mentioned objectives;
- the inclusion of these objectives even in modules where they are apparently of less direct relevance;
- full training programmes structured around these objectives;
- specific programmes (Masters and Specialist Masters degrees) clearly focusing on these priorities..

### New in 2012

Of the 9 modules initiated in 2012, one covers "**Serious nuclear accidents**" and 4 were opened within the School's Human and Social Sciences Department whose contribution to student training on sustainable development plays a key role in the School's strategy in this domain. This Department's range of courses contributes directly to the inter- and multidisciplinary nature of the programme, a fundamental keystone of training in sustainable development. It should also be noted that, in addition to this cognitive aspect, social science courses deal directly with societal problems where there is a direct link to sustainable development. The "**Sciences, Techniques and Arts. Techno-aesthetic systems**" course for example requires students to study and acknowledge the aesthetic dimension of technical systems by studying the ways in which they reconfigure the sensory fabric linking us to the world, to others and to ourselves. For its part, the "**Link, Exchange and Community**" course presents a set of sociological and anthropological theories that emphasise the symbolic dimension of social life, identifies the theoretical and methodological requirements specific to these approaches and describes how such conceptions of the social world can be applied to contemporary problems in the quotidian, cultural and professional spheres. It therefore provides a way of better understanding the role of unconscious perception in our choices, alongside techno-economic rationality.



The “**Industry and Sustainable Development**” module was redesigned in 2012, in a joint effort by the Year 1, Industrial Engineering and City Environment Transport Departments in partnership with the Teaching Department’s head of sustainable development, in order to make it more coherent and better aligned with the School’s ambitions for education in sustainable development.

However, because the impact on sustainable development comes through action, the Industrial Engineering Department’s “**Eco Bootcamp**” course offered the opportunity for 8 student teams to devise 8 projects to “transform the experience of users of a student residence to create a positive impact for the planet”. These projects included labelling crockery (in particular glasses) to reduce washing-up, insulation kits to improve room temperatures at minimum cost, a car sharing platform, a shared trolley for residents to reduce car use, in short the conception and implementation of simple solutions to reduce environmental impact while improving living conditions.

The induction seminar for students in the 9th intake of the Masters programme in Transport and Sustainable Development and in the 3rd intake of the Masters programme in Mobility and Electric Vehicles and the Specialist Masters programme in Electric Vehicle Engineering was accredited in European Mobility Week.

In 2012, **Science Cafe** laid on a series of lectures on environmental, economic and societal issues.

- 13 January: Didier Roux: - “Challenges and innovations in the habitat of the future”,
- 9 March: Françoise Heritier: “Male - Female: the construction of difference”,
- 27 April: Anne Muxel: “20-year-olds in politics: youth participation in politics”.

The Inaugural Lessons are part of the same strategy, as evidenced by the following 4 Lessons organised at the beginning of the 2012 academic year:

- 30 August: Yves Bamberger: “The electricity fairy in the service of sustainable development”
- 31 August: Alexandre Ern: “The storage of radioactive waste”
- 5 September: Georges Haddad: “The challenges of creativity”
- 6 September: Jean-Didier Vincent: “Human beings and the fascination with the other”.

Finally, to support its reflection on education in sustainable development, on 16 November the School organised a debate entitled “**Can the big engineering schools provide training on sustainable development?**” with Saïd Koutani, a doctor of physics, teacher and researcher, author of the 2012 work “Le devenir du métier d’ingénieur : vers une science et une éthique d’agencements durables des territoires” [The future of the engineering career: towards a science and ethics of sustainable spatial development] published by Editions L’Harmattan.



*Café des Sciences with Françoise Heritier*

## Disseminating sustainability concepts: strong industrial partnerships and a marked international focus

Because the concepts of sustainability need to become widespread in order to bring real and critical changes in our societies, the approach is always to tackle them through training in specific activities. This can only be done in very close alignment with scientific and methodological advances, the teaching of which constitutes the core of the educational strategy at École des Ponts ParisTech. Likewise, it is important that

the advances arising from research should quickly spread to the industrial world. That is why the School is keen to develop a strong structure of partnership with industries around issues of sustainability. This makes it possible to develop an approach that is both ambitious and pragmatic that will lead to real change in our societies.

In this respect, the list of teaching and research chairs at École des Ponts ParisTech speaks for itself:

| Chair title   | Partner corporation(s)  | Partner school(s)                                      |
|---|---|--|
| Forward modelling for sustainable development                             | EDF, Total, Renault, Schneider Electric, ADEME  | Mines ParisTech  |
| Capture, transport and storage CO <sub>2</sub>                            | Air Liquide, EDF, GDF Suez, Lafarge, Le Havre municipality Grand Port du Havre and Total    | Mines ParisTech, Le Havre University and BRGM          |
| Eco-design of buildings and infrastructures                               | Vinci   | Mines ParisTech and AgroParisTech                      |
| Innovative solutions for a sustainable and responsible habitat            | Saint-Gobain  | Mines ParisTech and AgroParisTech                      |
| Building sustainably and innovating                                       | Bouygues  | Ecole Centrale de Paris, Supélec, CSTB                 |
| Materials science for sustainable construction                            | Lafarge   |  |
| Sustainability of energy materials and structures                         | The European foundation for the energies of tomorrow and its founder EDF, GDF SUEZ, GRT Gaz | Mines ParisTech  |
| Hydrology for a resilient city  | Veolia  |  |
| Fluid mechanics applied to hydraulics and the environment                 | EDF   |  |
| Socio-economics and modelling of urban public passenger transport systems | STIF  |  |
| Financial risks   | La Fondation du Risque and its founder Société Générale                                     | École Polytechnique, Université Pierre and Marie Curie |
| Transport infrastructure management                                       | abertis   | IFSTTAR  |
| The city  | AFD (French Development Agency), SUEZ ENVIRONNEMENT, GDF SUEZ                               |  |
| Reinventing stations in the 21st century                                  | SNCF Gares & Connexions   |  |
| Rail transport sciences   | Eurotunnel Group  |  |
| The "d.thinking Paris" partnership  | Thales, GDF SUEZ and Panasonic Europe Foundation  |  |

In addition to these development-related chairs, there are two of the three chairs managed by École d'Économie, of which École des Ponts is one of the six founding institutions:

- Chair in Economics with the Ministry of Sustainable Development;
- Chair in the Economics of Transparency and Integrity

Of the 16 École des Ponts chairs, 9 focus directly on sustainable development issues, 2 on the sustainable environment and 3 are working to improve rail system performance for sustainable mobility.

This reflects the quality of the research produced by the School on these topics.

In addition, École des Ponts ParisTech is a very active member of the Sustainable Mobility Institute, set up by ParisTech and Renault, participating in three of that Institute's four research programmes, two of them in a direct leadership role (Electric Mobility System – LVMT – and Global Vision for the Emergence of Electric Mobility – CIREDD).

Since the issues around sustainable development are often global, the scale of the action proposed needs to be the same. The School's research is clearly structured to reflect this reality, as evidenced by the participation of CIREDD and LMD in the drafting of IPCC reports (Intergovernmental Panel on Climate Change), and its educational approaches follow the same path:

- by covering certain global scale issues: e.g. the "Climate Change" workshop, the course on "Growth and Development Theory" or on "Transport and Developing Countries", which tackle global challenges, issues of equity and the specificities of developing countries;
- by developing intercultural education to facilitate dialogue and understanding;

- by opening up these courses to foreign students.

The School's laboratories are also actively involved in disseminating sustainability approaches. An example is LVMT, one of whose members, in collaboration with 3 other professors, produces the module on "Preparing professionals in the urban development, construction and building sector for the challenges of energy transition". This is part of the Francophone Initiatives for the promotion of sustainable cities in Africa, backed by the OIF (International Francophone organisation) through its subsidiary agency, IFDD (Francophone institute for sustainable development). It is produced at the initiative of IFDD and the African School of Architecture and Urbanism Activities (EAMAU) in partnership with the Association ENERGIES 2050 and with the support of ECREEE (the CEDEAO's Regional Centre for Renewal Energy and Energy Efficiency), ADEME, BOAD and CGLUA (United Cities and Local Governments of Africa). The first live session of the programme was held from 11 to 16 November 2012 in Lome (Togo); a second took place from 11 to 15 March 2013 in Lome (Togo), completing the course.

École des Ponts ParisTech is thus working for the widespread adoption of sustainable methods of governance.

It might be thought that because École des Ponts ParisTech's fundamental strategy for sustainable development is medium-term and broad in scope, this might restrict its impact on the School's short-term profile. Far from it, since the School was judged "**exemplary**" for its research and "**committed**" for its education in the survey on sustainable development in higher education carried out by the magazine *l'Étudiant*.

## The construction of a CSR approach: governance at École des Ponts ParisTech

In line with France's Grenelle de l'environnement environmental objectives, in 2012 the School appointed Laurent Petit, the School's Head of Quality, to **draw up its green plan**. The aim is to implement a coherent and visible strategy to underpin the School's action for a Green Campus, for social diversity and for the quality of its local contributions.

While the delivery in 2013 of the new Coriolis positive energy building, which represents an investment of €22.5 million and now houses the School's laboratories, previously scattered around the campus, is of course a particularly visible achievement, the School's concern for its environmental impact is apparent in its day-to-day management of its campus.

For example, it now uses only eco-responsible paper and is markedly reducing its paper consumption. This commitment is also illustrated through the rise in the proportions of organic products used in its catering services or in the use of furniture made entirely of wood from sustainably managed forests, a responsible procurement policy (in segments made up of at least 50% labour, at least 10% of total current purchases are associated with employment integration programmes: integration firms, intermediary associations, GEIQ [employer groups for integration and qualification], etc., or structures employing a majority of workers with disabilities) or carbon footprint calculation and reduction. All these actions will be incorporated and reinforced in the green plan, which will set precise targets for each of them and provide performance assessment indicators.

Finally, École des Ponts ParisTech encourages and strongly supports practical initiatives of social commitment by its students.

For example, at the start of academic year 2009/2010, the School and the DévelopPonts Association set up a tutoring programme called "**Expérience Ouverture**" [inclusion experience]. Styled "Cordées de la réussite" (lifelines to success), it is aimed at secondary school pupils in the Seine-et-Marne Department as part of the École des Ponts ParisTech campaign to develop social inclusion by establishing links between students of a top Engineering School and secondary school pupils from priority education zones. It seeks to give them information on all areas of higher education, motivate them to consider potentially highflying careers, demystify the concept of top-level education and combat the phenomenon of self-censorship.

But the Association's work does not stop there. Growing in scope over the years, every week DévelopPonts organises school support classes for interested secondary school pupils and draws on its reputation on the campus to involve students, teachers and the administration initiatives on behalf of big charity organisations: La Bande Alimentaire, disability awareness and Téléthon. It is also involved in humanitarian work in Togo (developing technical solutions for potential application there: a water pump designed to reduce the use of well water, latrines and a Stirling engine).

Finally, through a partnership with the firm Comeq, DévelopPonts enables both students and staff to buy freshly picked regional fruit and vegetables within the School itself. This organisation thus embodies the commitment of École ParisTech students to sustainable development, playing a full role at local level in response to global challenges.

## The Coriolis Building

A new, innovative, energy-efficient building designed for teaching and research

At Cité Descartes, in Champs-sur-Marne (77), École des Ponts ParisTech is developing an innovative centre for research on energy management in construction and sustainable urban development. Coriolis, a structure owned by the School, is a **world-class, positive energy building** which combines energy efficiency, quality, comfort and health. It welcomed its first occupants in summer 2013.

**Coriolis houses educational and research activities: experiments, modelling, the d.school with its focus on training for breakthrough innovation...** It contains offices, laboratories, a 400 seat amphitheatre and a 300 m2 experiment hall.

Coriolis was completed at the same time as the **Bienvenüe building**, commissioned by the Ministry of Ecology, Sustainable Development and Energy. It is home to IFSTTAR as well as research units belonging to École des Ponts ParisTech, CSTB, the urban planning institutes (IFU and IUP) and Université Paris-Est.

These 2 new structures have introduced a fresh dynamic into the relations between the research and teaching communities, forming a **world-class centre of excellence for the sustainable city**.

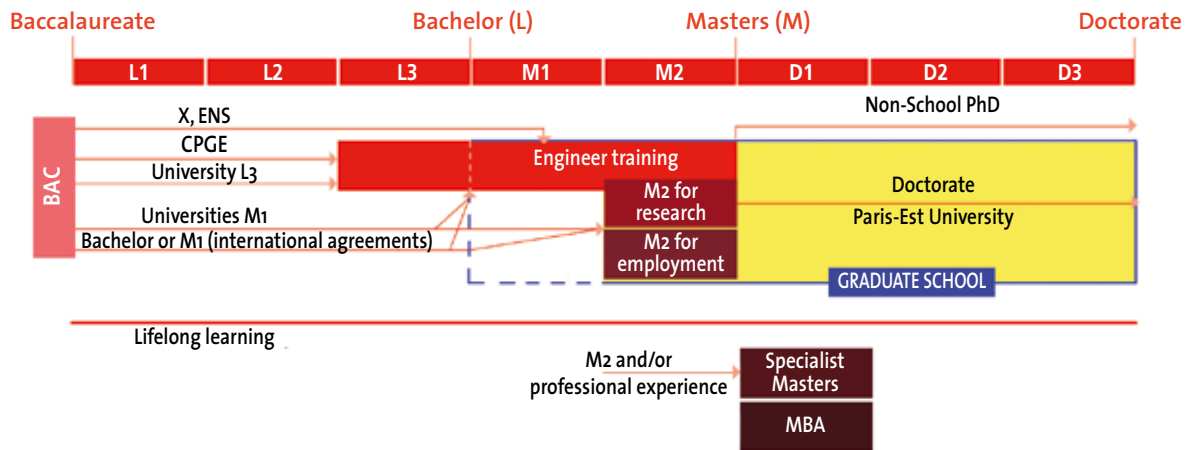
To follow the progress of the construction site with Time-Lapse: [www.digitime.fr/enpc/](http://www.digitime.fr/enpc/)





# Training at the Ecole des Ponts Paris Tech

## The teaching programmes and European L-M-D scheme



An employer who recruits a graduate of École nationale des ponts and chaussées is looking for:

- a potentially highflying executive,
- an engineer with an expertise in his field,
- an executive with real capacity to adapt.

École des Ponts ParisTech offers a particularly rich and diverse range of career options construction and the environment, transport, the service sector, consultancy, or else economic and financial engineering.

As a broad-based institution providing access to several core careers, École des Ponts ParisTech offers its students strong scientific and technical skills in the School's spheres of excellence: applied mathematics, mechanical engineering, economics. The syllabuses develop an understanding and grasp of conceptual, mathematical or numerical modelling, while also imparting the skills to assess such approaches objectively. This is one of the keystones of the work of an engineer, researcher or manager.

Some disciplines run across all 6 departments: data-handling; risk management; sustainable development; business understanding; knowledge of 2 languages, one of them English.



Class of 2013



# Training of student engineers in the corps des ponts, des eaux and des forêts (state civil, hydraulic and forestry engineers)

The training of the corps des ponts, des eaux and des forêts is organised jointly within ParisTech, by the School and its equivalent in rural, hydraulic and forestry engineering. The ministerial order of 27 November 2009 on the training of student engineers for state service, and on the revision session organised for the winners of the internal examination for access to the state engineering corps, specifies the aims of the course.

The training curriculum covers 2 years:

- the first year completes the scientific and technical programme, and is generally crowned either with an engineering degree from École nationale des ponts et chaussées or a degree from Institut des sciences et industries du vivant et de l'environnement (Institute of life and environment sciences and industries); a Masters degree in research can be undertaken in parallel, notably in preparation for a PhD.
- the second year of preparation for senior management roles primarily in the public and semipublic sector. This takes the form of a Specialist Masters degree accredited by the Conférence des grandes écoles: Public Policies and Actions for Sustainable Development.

To allow for the different backgrounds of student engineers and the needs expressed by employers, this general system can be adapted in a number of ways.

In September 2012, the School welcomed the 2014 intake of student engineers into the corps des ponts, des eaux and des forêts after the merger between it and the Ponts and Chaussées engineering corps (Decree of 10 September 2009).

While primarily centred on the École Polytechnique, recruitment is also open to the Écoles normales supérieures, to the Institut des sciences et industries du vivant et de l'environnement and other high-level scientific schools, including École des Ponts ParisTech. Students from École Polytechnique and the Écoles normales supérieures follow the whole syllabus. Engineering students recruited through other channels, as well as successful candidates in the internal vocational examination for access to careers as a state engineer, only follow the second year of the syllabus.

## At the beginning of academic year 2012:

- the class of 2014 comprised: 25 students from the École Polytechnique and 2 from École normale supérieure Paris. In all, 17 École Polytechnique students were following the École des Ponts ParisTech engineering syllabus.
- the class of 2013 comprised: 28 École Polytechnique and 2 École normale supérieure Paris students; 13 engineers recruited through the vocational examination, 9 recruited through the open external examination for engineering graduates from AgroParisTech

and 7 from the open external examination for graduates from other scientific schools (recruited in 2012); together with a student from École Normale Supérieure for whom the first year of the course was waived because of his career background. Of these 61 students, 54 were following the Specialist Masters degree course in "public policies and actions for sustainable development", 2 were in the first year of their PhD, 3 were training at the Collège des Ingénieurs, 1 was taking the "Alisée" Masters degree course delivered by ENGREF, 1 the "APE" Masters programme..

## Functions of the Corps des Ponts, des Eaux and des Forêts (IPEF – State civil, hydraulic and forestry engineering corps)

Official Journal, 12 September, Decree No. 2009-1106

"Official Journal, 12 September, Decree No. 2009-1106" Engineers in the Corps des Ponts, des Eaux and des Forêts constitute a senior corps of a technical nature, as defined in the above referenced Article 10 of the law of 11 January 1984, and of an interministerial nature, classified in Category A as provided for in Article 29 of the same law.

This corps reports to the ministers responsible for agriculture and sustainable development.

Under the authority of the relevant ministers, they participate in the conception, implementation and assessment of public policies, in particular in fields relating to:

- 1- The climate;
- 2- Energy demand;
- 3- Spatial planning and sustainable development;
- 4- Housing and the city;
- 5- Transport;
- 6- Productive agriculture and forestry;
- 7- The management and preservation of natural land and sea areas and resources;
- 8- Food and the agri-food industry;
- 9- Research, teaching, training and development in the fields cited in 1 to 8.

Their remit is to manage, support, monitor, inspect, study, assess and evaluate public policies, to teach and conduct research, in international as well as French organisations. They carry out any other mission of a scientific, technical, administrative, economic or social nature that may be entrusted to them by any minister."



"He added a new ornament to the city"

# The engineering degree programme

## Principal changes in 2012

### Procedure for engineering course licensing by the Engineering Qualifications Committee (CTI)

The self-evaluation form was filed at the end of March and the assessment team, appointed by the Engineering Qualifications Committee, conducted an audit on 4 and 5 June 2012 and issued its report in October. The School's application was examined in a plenary session of the CTI on 13 November 2012. At the beginning of 2013, the CTI published the School's six-year licence.

### Decision to open up recruitment to "Prépa Bio" students

For the first time in September 2013, the School offered students in the BCPST stream (Biology, Chemistry, Physics, Earth Sciences) access to a first-year engineering degree, with the allocation of two places. For this purpose, the School joined the Écoles Normales Supérieures grades database, in order to incorporate this recruitment into the framework of existing ENS examinations. This choice reinforces the strong policy of diversification in engineering student profiles, evidenced today by the recruitment of foreign students from many countries (1/4 of graduates) and the varied academic background of its students (e.g. students from the HEC Paris curriculum or architecture graduates from the École nationale supérieure d'architecture de la Ville and des Territoires).

### Place of Sustainable Development in educational initiatives

In keeping with the School's performance contract for the period 2011-2014, teaching on the issues of sustainable development is a central component of the education and skills running across the different engi-

neering syllabuses. In 2012, the new courses illustrate the reality of this commitment. Of the 9 modules inaugurated in 2012, one covers "Serious nuclear accidents" and 4 were opened within the School's Human and Social Sciences Department whose contribution to student training on sustainable development is a strong element of the School's strategy in this domain. The "Industry and Sustainable Development" module was also remodelled in 2012, in a joint effort by the Year 1 departments, Industrial Engineering and City Environment Transport in partnership with the Education Department's head of sustainable development.

### "Ponts Refresh" Survey

The elected student representatives on the Teaching and Research Council conducted a survey christened "Ponts Refresh", which culminated in some 50 proposals on teaching, student life and communication. The School incorporated the survey results into its quality approach: identification of needs, improvement plans.

### Introduction of new courses

The teaching syllabus further expanded in 2012 with the creation of new courses:

- Challenges of serious nuclear accidents (Mechanical Engineering and Materials Science)
- Arts sciences technologies and societies (HSS – Human and Social Sciences)
- Discourse and Social Modelling (HSS)
- Links, Exchanges and Community (HSS)
- Technical Sciences and Art (HSS)



## Introduction of the Focus Métiers (Career Focus) partnership

The Teaching Department and the Development Department, working closely with the Student Office, have established structured relations with partner companies for the promotion of careers, professional pathways or internships with students of the School, as part of a system named Focus Métiers (Career Focus).

## Briefing and training of teachers

Initiatives introduced as experiments in 2011 have been extended and brought into the mainstream. A second "Teachers' Day", individual induction for all new module heads, teaching guides. A whole dedicated section (Teacher Page) is available for teachers on the School website. Six teacher training initiatives have been organised: 3 in partnership with ParisTech, 1 in partnership with Paris-Est and 2 internal, reaching more than 40 teachers.

## New course management application

The "Information System" mission, supported by the IT Department, conducted a needs assessment, ran user groups and established the parameters for this new student and course management system, christened ENEP, planned to come into operation in 2013.

## Recruitment in Year 1

|                                       |    |
|---------------------------------------|----|
| Joint Mines-Ponts examination:        |    |
| Maths & Physics (MP)                  | 58 |
| Physics & Chemistry (PC)              | 28 |
| Physics & Industrial Science (PSI)    | 36 |
| Physics & Technology (PT)             | 2  |
| Technology & Industrial Science (TSI) | /  |
| Admitted via university               | 4  |

## Joint examination 2012: applicant ranking

| Sections | First | Last | Mid-rank |
|----------|-------|------|----------|
| MP       | 34    | 382  | 281      |
| PC       | 100   | 198  | 154      |
| PSI      | 54    | 144  | 103      |

## Year 2 recruitment by qualification and integrated further training: 282 students

|   |    |
|---|----|
| (plus 133 students from Year 1)                   |    |
| Engineering students (corpsards)                  | 17 |
| Engineering students (X civils)                   | 35 |
| Écoles normales supérieures                       |    |
| Engineering students                              | 6  |
| Engineering students, qualified architects        | 5  |
| Grande École HEC programme student                | 1  |
| MSc engineering students                          | 7  |
| ParisTech engineering students recruited in China | 2  |
| International double-degree engineering students  | 80 |

## Countries where engineering students undertake their double-degrees:

| School  | Country        | Number of students concerned |
|---|----------------|------------------------------|
| Universidad nacional del litoral - Santa Fe                 | Argentina      | 1                            |
| EPUSP (São Paulo)   | Brazil         | 5                            |
| UFMG (Minas Geiras)   | Brazil         | 7                            |
| Universidade Federal do Rio de Janeiro (UFRJ)               | Brazil         | 2                            |
| University of Architecture, Civil Engineering and Geodesics | Bulgaria       | 1                            |
| Ecole Polytechnique de Montréal                             | Canada         | 4                            |
| University of Montréal                                      | Canada         | 1                            |
| Tongji University Clg of Civil Engineering                  | China          | 5                            |
| University of Nanjing                                       | China          | 1                            |
| University of Tsinghua                                      | China          | 1                            |
| CVUT Prague   | Czech Republic | 1                            |
| TU Dresden  | Germany        | 1                            |
| NTU Athènes   | Greece         | 5                            |
| Politecnico di Milano                                       | Italy          | 2                            |
| Politecnico di Torino                                       | Italy          | 2                            |
| Roma Tor Vergata  | Italy          | 2                            |
| Università degli studi di trento                            | Italy          | 3                            |
| Tokyo Institute of Technology                               | Japan          | 3                            |
| University of Tokyo - School of Engineering                 | Japan          | 1                            |
| ESIB (Beyrouth)   | Lebanon        | 2                            |
| EHTP (Hassania School of Public Works)                      | Morocco        | 8                            |
| TU Delft  | Netherlands    | 1                            |
| Warsaw Institute of Technology                              | Poland         | 2                            |
| Wroclaw University of technology                            | Poland         | 1                            |
| FEUP (Porto)  | Portugal       | 3                            |
| UTC Bucharest   | Romania        | 5                            |
| Novosibirsk State University (NSU /NGU)                     | Russia         | 1                            |
| ETSICCP Barcelona   | Spain          | 8                            |
| ETSICCP Grenade   | Spain          | 2                            |
| ETSICCP Madrid  | Spain          | 7                            |
| ETSII Madrid  | Spain          | 4                            |
| ETSICCP Santander   | Spain          | 4                            |
| ETSICCP Valencia  | Spain          | 2                            |
| KTH   | Sweden         | 1                            |
| ETH Zurich  | Sweden         | 2                            |
| ENIT (Tunis)  | Tunisia        | 5                            |
| Imperial College (Londres)                                  | UK             | 3                            |

# Student numbers on 1 January 2013

|                                   |            |
|-----------------------------------|------------|
| Year 1 .....                      | 133        |
| Year 2 .....                      | 230        |
| Further integrated training ..... | 52         |
| Gap year (long internship) .....  | 176        |
| Year 3 .....                      | 214        |
| Student interns .....             | 77         |
| <b>Total .....</b>                | <b>882</b> |

## Year 1

### Consolidation of scientific foundations and exposure

Year 1 is a year of transition between previous education (preparatory classes or first degree) and the engineering Masters programme. It provides a solid scientific grounding in mathematics, mechanics, IT and economics, whilst encouraging students to open up to other disciplines, in particular through an optional scientific course,

classes in the social sciences and seminars (communication, industry and sustainable development, design).

Students are also exposed to new ways of learning through a project and internships.

### The Masters programme (Years 2 and 3)

At the end of the first year, or on their entry to the School for the Masters programme, students choose a department.

The departments provide and implement the teaching syllabuses.

They constitute the School's clusters of specialist skills in its specific scientific, technical and professional fields.

In this capacity, they are also the pivotal components in the School's specialist academic and/or international partnerships.



# The engineering degree programme: Departments: 2012 highlights

## Year 1 Department – Y1

Chair: Alain Maruani

Academic Director: Jorge Queixalos

### Year 1 inaugural classes:

Every year, student engineers have the opportunity to attend lectures delivered by well-known figures from the scientific and academic world. They also benefit from full seminars on specific themes. The purpose of this combined programme is to enable students to further widen their range of scientific and cultural knowledge

- **Yves Bamberger**, scientific adviser to the Chairman of EDF, member of the Academy of Technologies: “**The electricity fairy in the service of sustainable development**”, 30 August.,
- **Alexandre Ern**, Deputy Director of the CERMICS Laboratory: “**The storage of radioactive waste**”, 31 August,
- **Georges Haddad**, Director of Education Research and Foresight in UNESCO’s education section: “**The challenges of creativity**”, 5 September,
- **Jean-Didier Vincent**, member of the Institute (Academy of Sciences) and the National Academy of Medicine. Emeritus professor at Institut Universitaire de France (Paris-Sud Faculty of Medicine - Université de Paris XI): “**Human beings and the fascination with the other**”, 6 September.

### 11th Design Workshops: 12-16 March

Since 2000, the Design Workshops have been organised at Champs-sur-Marne jointly by École des Ponts ParisTech and École nationale supérieure d’architecture de la ville & des territoires (ENSAVT). This 11th edition attracted **230 students organised into 51 mixed teams to work on 12 pre-decided projects** (shell shelter, sandwich furniture, unfolding wall, glider...). All these projects were built with a range of materials such as cardboard, wood, plaster, fibreglass, PVC, concrete...

This seminar is a high point of creativity and “project work”. Participants in the Design Workshops also includes students of other institutions, from France and abroad.

- one engineering school: ESIEE Paris,
- one architecture school: UTH Volos in Greece and
- one design school: ESAG (Higher School of Graphic Arts).

Each team was required to focus on one of the 12 themes chosen by the organisers, applying a particular set of specifications. The purpose of this exercise is to make the students think about the relation between an object’s form and function, and to **give them a first experience of the technical design process**. Through it, students in engineering, architecture and design combine their skills and develop mutual technical awareness. It represents the first step in a pedagogical process introduced by École des Ponts ParisTech and ENSAVT to train architect-engineers and engineer-architects, an essential combination for the design and building of major engineering structures.

The best projects were then displayed in the hall at École des Ponts ParisTech. The event was organised by the Civil and Structural Engineering (GCC) and Mechanical Engineering and Materials (GMM) departments. The students were assisted by engineers, architects, designers and researchers.



**Seminar on “sustainable development: analysis and actions”, 3 and 11 December**

The VET, GI and Y1 departments, in collaboration with Emeric Fortin, Head of Sustainable Development in the Education Department, conceived and organised this seminar for Year 1 students. The aim was to recall the

issues in relation to existing realities. It was structured around 2 main debates: “Sustainable development or how to reconcile differing interests?” and “Taking account of sustainable development: a profound change in the engineer’s job”. It also included 12 thematic workshops, out of which students chose four in which to participate.



Design Workshops



## Year 1 Language Training Department – DFL

Chair: Jörg Eschenauer

Deputies: Tina Benis, Thomas Harcharick

### Language learning: a driving role in the School's international strategy.

Languages play an essential role, because they open the doors to other cultures and help to prepare students to work anywhere in the world. All the pedagogical practices and modules (around 200 per year) encourage the development of intercultural skills. The curriculum includes:

- compulsory experience of a minimum of eight consecutive weeks abroad for students joining in Year 1. Students going directly into the Masters programme are also strongly encouraged to do the same. The average time spent abroad is 11 months for an engineering student;
- compulsory English classes, with an external certificate of achievement required to obtain a degree (a score of 785 in the TOEIC – test of English for international communication);
- compulsory classes in a second language, chosen from a wide range of options: German, Arabic, Chinese, Spanish, Italian, Japanese, Portuguese, Russian and French for foreign students;
- training for public speaking (debates in English and German);
- the possibility of study trips to the USA as part of a remote collaboration module between 2 groups of students using videoconferencing and social networking. This year, it ran from 18 to 26 February. 14 students went to the University of South Carolina campus in Columbia on the Speaking Near and Far English course. The project was partly supported by Michelin USA and Campus France USA;
- the possibility of taking part in “tandem” modules (face-to-face work between people speaking two different languages, so that they can each improve



Host students from the University of South Carolina



their grasp of the other language and their familiarity with the other person's culture).

### Support and individual initiatives for foreign students

The Department is responsible for language training, induction and integration for foreign students:

- welcome on arrival: tour, explanations, help with administrative formalities, etc.,
- intensive preparatory courses for the study of engineering in French or French expression before the first term classes,
- on-request services in the French section: tutoring, individual appointments, assistance with CVs, letters, interviews, examinations, oral presentations, methodology, phonetics...
- more than 30 French classes provided each year, adapted to the levels and needs of foreign students, as well as (inter)-cultural induction classes;
- specialist French classes for students in certain Masters programmes or from certain geographical areas.

The Language Training Department is particularly active within UPLEGESS (Union of Engineering and Management School Language Teachers) and in the Conférence des Grandes Écoles.

Moreover, Jörg Eschenauer, Chairman of the School's Language Training Department was elected Chairman of UPLEGESS for 3 years at the Association's AGM on 7 June 2012. He succeeded Jean Le Bousse, head of Chimie ParisTech's Languages and Cultures Department, who had held the position since 2000.

## Human and Social Sciences – SHS

### Chair: Gilles Crague

In their work, engineers are exposed to sociotechnical realities that involve not just technical artefacts, but behaviour, culture (regional, national, professional) and reasoning that can be varied and sometimes contradictory. While necessary and essential, a grasp of technical and scientific knowledge alone is not enough to resolve the problems that engineers face: because solving an equation does not resolve a social conflict; because a company's different stakeholders (customers, suppliers, employees, local communities, state) are not necessarily convinced by techno-economic reasoning alone; because concrete and contingent problems are subject to uncertainty and often require engineers to take risks and devise new solutions rather than applying pre-existing knowledge. The purpose of the syllabus in the SHS Department is to prepare student engineers to tackle and handle problems and situations of this kind. This requires developing:

- a capacity to understand problems and situations globally and multidimensionally (rather than from a single, univocal and fixed perspective);

- a capacity for critical argument (in order to resist “intellectual fads” and “ready-made” solutions);
- imaginative capacity (to escape patterns of thought, to see the world through other eyes and to devise tailored and – sometimes – new solutions).

The SHS Department's courses continue throughout the degree programme, in Year 1 and in the Masters programme (Year 2 and 3). The range of courses in Year 1 takes the form of one communication class and one class on the “analysis of techno-scientific controversies”. At Masters level, the Department runs courses across the School's 6 specialist departments and has a dedicated section in the timetable. Masters students are obliged to follow (at least) one of the SHS Department's courses.



Café des Sciences with Cédric Villani



Inaugural Lecture with Jean-Didier Vincent



**Civil and Structural Engineering – GCC,**  
**Chair: Bernard Vaudeville,**  
**Professor and Associate**  
**Director of T/E/S/S**  
**engineering workshop**  
**Academic Director: Romain**  
**Mège**  
**Student numbers 2012-2013:**  
**248 students + 58 Specialist**  
**Masters students (GCE,**  
**GCGOE, IBE)**  
**Pride of place to students!**

A book by Alain Capra and Aurélien Godreau, 2 former students in the GCC Department – “**Ouvrages d’art en zone sismique**” (engineering structures in seismic zones) was published in January by Editions Eyrolles. It provides a summary of the theory underlying the new regulations, the regulatory requirements to be met in the design of an engineering structure and examples of applications.

Two students in the Structure & Architecture section – **Amandine Cerosimo (architecture student at EAVT)** and **Charles Bernard (student at the GCC Department)** were awarded gold medal in the “Indoor Room” category in May 2012 in the “Steel Build” competition, at a ceremony held at the la Cité de l’Architecture.

**Christopher Pinck** won the “**Energia Challenge**” competition prize for the subject “Producing energy with algae”. This prize is one of the “4 Energy Prizes and Trophies” awarded by GEP- AFTP – Group of Hydrocarbons and Related Energies Enterprises and Professionals. Christophe Pinck is currently completing his End-of-Course Project (PFE). After Year 2 in the GCC Department, he took a Masters in MMS (Mechanics of Materials and Structures) in Year 3.

**Solidays Project: further success for a project by one of the Department’s students**

As part of their training, 6 students worked on the creation of a 600 m<sup>2</sup> Well-Being Space for the Solidays Festival, held from 22-24 June 2012 at the Longchamp racecourse. École des Ponts ParisTech, the Navier Laboratory and the Solidarité Sida AIDS Association pursued the adventure, following the success of their previous year’s partnership on the building of a grid-shell at the Solidays Festival in June 2011. This year, the students worked on 5 giant canopies made entirely of wood, the “Green Corner”. Forming a bubble of calm and relaxation, this space provided a shelter for festival goers, notably offering three kinds of massage. Like a grove of trees, the space was sprinkled with large, temporarily inhabited structures, housing different programmes: bar, reception, small rooms... The project was both an educational exercise and a unique introduction to the working world.

**Induction weeks**

- **Geodesics and accurate positioning:** In partnership with ENSG, the week of exposure to geodesics and accurate positioning raised student awareness of the importance of these skills in the implementation phases of civil engineering projects and taught them to handle the different apparatus used.

- **Building the void:** the purpose is to get engineering students and architecture students to collaborate on a project to refurbish a cement storage building on the banks of the Ourcq Canal by digging into this “concrete steamship”. The void thus created must be

appropriately lined and sized for the project to be coherent.

**New course: advanced structure**

The aim of this module is to bring student engineers in their final year of training to the frontiers of current knowledge in the field, so that they can offer the profession innovative solutions for the design of light, unfolding structures, which behave in ways outside the domain of classic linear elasticity.

**Industrial Engineering – GI**

**Chair: Fabrice Bonneau,**  
**Professor and CEO France at**  
**Argon Consulting**  
**Academic Director:**  
**Véronique Hillen**

**Student numbers 2012-2013: 95**



The goal of the Department is to train engineering students to become intrapreneurs, i.e. entrepreneurs capable of reinvigorating companies by creating new industrial activities and innovative new projects. To achieve this, the Department develops their skills in two key areas of value creation, product innovation and supply chain. Two projects – Melusine and Innovacteurs – are carried out in students’ first year, in close collaboration with professionals. In the final year, most students go abroad for training. Half a dozen followed ME310 Design Innovation, a full-time programme run in collaboration with Stanford university and industrial partners (Panasonic, GDF SUEZ, Angénieux), which is open to students from other disciplines (design, commerce).

In 2012, the **Melusine projects** were conducted with companies like Capgemini Consulting, Vente-privee.com, Verallia, Argon Consulting, Groupe Poult, Sanofi Aventis, HelloFresh. On the menu:

- Operational optimisation by the ABE (Buildings Energy Agencies) responsible for maintaining railway stations and platforms;
- Overhaul of logistics practice on the basis of current and future flows and constraints;
- Organisation of a collaborative information sharing platform;
- Creation of decision support tools based on spare parts typology;
- Optimisation of industrial planning in a multisite environment;



Visit to S4 Roissy CDG satellite site



- Optimisation of the management and pooling of security stocks of finished products;
- Optimisation of upstream Raw Materials and Packaging storage;
- Improvement in order preparation planning in distribution pharmacies;
- Remodelling of the process of point-of-sale advertising distribution;
- Optimisation of the fresh product kitting process in a start-up.

**The Innovateurs projects** were carried out with ENSCI Les Ateliers, RATP, Panasonic, Suez, Air Liquide, Stupeflix. On the menu, a handful of projects:

- Reinventing the experience of users of a student residence to create a positive impact on the planet;
- Redesigning oxygen bottles in a hospital;
- Reinventing textile donations for recycling;
- Reinventing the experience of the refrigerator;
- Reinventing subway queueing;
- Reinventing the experience of publishing videos for individuals;
- Reinventing the experience of older people;
- Reinventing the experience of tourism in Morocco.

**The third ME310 Design Innovation took place in collaboration with the Stanford and Potsdam d.schools.**

**Three teams in Paris worked with 2 Stanford teams and one German team, in a network of around 20 projects.**

The ME310 consists of some 100 students divided up into teams, a dozen global academic partners, around 15 global companies, 30 or so professors, 30 or so professional coaches and another 30 or so assistants. In 2012, ME310 Paris collaborated with Panasonic, GDF SUEZ and Angénieux on 3 projects:

- Reinventing the experience of TV for the European market;

- Reinventing the capture of moving and high-definition images for the cinema;
- Reinventing eco-efficiency in buildings in the light of user experience.

#### Creation of Paris-Est d.school

In collaboration with 4 institutions (ENSAVT, UPEMLV, ESIEE Paris and EIVP), all members of Université Paris-Est, the ambition was to create the first French d.school, with a focus on sustainable development found nowhere else in the world. Its mission is to train students and teachers from the partner institutions and the ParisTech network innovation through “design thinking”. This discipline inspires an approach to innovation based on specific states of mind, a set of methods and tools, and a scenography of spaces. The Paris-Est d.school encompasses 3 Industrial Engineering Department modules: the Innovation and d.thinking course, the Innovateurs project and the ME310 Design Innovation programme in cooperation with Stanford, HPI and Aalto (Californian, German and Finnish d.schools). It draws on the Industrial Engineering Department’s experience in innovation since 2007.

#### Lunching with a young graduate

A new format for discussion with alumni has been tested: around lunch in the cafeteria, a young graduate (2-3 classes ahead) talks to current students about his or her career and gives them advice on their choices of internship and Year 3 programme. One such lunch on the topic of Aeronautics was attended by 10 students, all of whom enjoyed the occasion and recommended the continuation of this type of discussion.

#### Presence on social networks

The students have created Industrial Engineering Facebook and LinkedIn groups. The Facebook group is a place for students to talk informally amongst themselves, but also with the Department’s management. It has been used to test the network as a way of creating links and the momentum for an “eco-boot camp” course. The LinkedIn group brings together graduates from different year groups and provides a forum for discussion about internship and career choices.

#### Department trip to Toulouse

The topic was the importance of the human element in industry. A new pedagogical instrument proved a great success: on coach visits to a company, groups of students were put in charge of entertainment in the coach, as an original, dynamic and educational way of providing everyone with important information about the business to be visited. Destination companies included: Latécoère, Labinal, Airbus, Poulit, Pierre Fabre, Blanc Tailleur, a business incubator.

#### Range of classes

The Eco Bootcamp class offered a way of testing a learning method that is halfway between ME310 Design Innovation and the seminar that has replaced it, the eco-innovation seminar. Through educational engineering, the most effective level was found for a typical class at Paris-Est d.school (32 students, 8 teams, 2 teachers) in terms of resources (with a stronger team), teaching materials, project reviews, field preparation, practical exercises illustrating theoretical concepts, the use of new media to generate enthusiasm and energy.

A new type of approach was also tested: a scientific project on an operational research topic in collaboration with a CERMICS researcher. This gave a number of students the possibility to explore a scientific field in greater depth, and gain experience of research by



Bottle Manufacturing (Cognac factory Verallia)  
© Frédéric Buxin

drafting a research paper. Since the experiment proved highly successful, it was decided to make it a part of the Industrial Engineering syllabus as a possible alternative to the *Innovateurs project*.



### Mechanical Engineering and Materials – GMM

**Chair:** Alain Ehrlacher,  
Professor and researcher at  
the NAVIER Laboratory  
**Academic Director:**  
Sébastien Gervillers  
**Student numbers**  
2012-2013: 90 students

The GMM Department trains future research engineers or design engineers for the development of new products and materials, particularly in the energy and transport sectors. Particular emphasis is placed on a high-level grasp of concepts and tools relating to the mechanical behaviour of materials, and on ways of thinking that lead to environmentally responsible design.

**The main career opportunities are in the following sectors:**

|                          |     |
|--------------------------|-----|
| Materials                | 10% |
| Energy                   | 33% |
| Automotive and transport | 12% |
| Aeronautics              | 9%  |

**The main positions held are:**

|  |     |
|--|-----|
| Design engineer and design project manager | 35% |
| Research and development engineer          | 22% |
| Project or programme management            | 20% |

**Newly created courses:**

- **Molecular simulation in materials sciences.** Goal: to acquire familiarity with the main tools of molecular simulation
- **Materials imaging.** Goal: to master image analysis measuring tools (SEM, micro-tomography...)

**Department trip to Morocco:**

- Tangiers: Renault, ONE, TangerMed
- Casablanca: Hassania, Aircelle

**Design week : :**

Students use skills acquired in the first term to design, calculate, make and measure a sports device made from composite materials during a week set aside for the purpose

**Noteworthy publication**

An article with the title “Phase Evolution During the Liquid-Phase Bonding of Zirconium and Austenitic Stainless Steel with Zinc Insertion” was published in June. It is the outcome of work done in Tokyo by Guillaume Reboul, a third-year student in the Department.

**Pride of place to former students!!**

**Echy hybrid lighting: student project wins the 2012 Future Engineering Prize**

The 7th Future Engineering Competition, on the topic of “Imagining the Eco-City of the Future”, organised by Syntec Ingénierie, gave awards for 2 projects: the Echy project (École des Ponts ParisTech), and the Polyv’iles project (Compiègne University of Technology).

**Quentin Martin-Laval, Paul Fourment**, both former students in the School’s Mechanical Engineering and Materials Department, and Florent Longa, are the inventors and designers of ECHY hybrid lighting, a way of capturing sunlight and channelling it into buildings via optical fibres.

### Mathematical Engineering and Computer Science – IMI

**Chair:** Éric Duceau,  
Professor and Scientific  
Director at EADS  
**Academic Director:**  
Malika Kadri  
**Student numbers**  
2012-2013: 80 students



Influenced by the emergence of new themes in industry and services, the IMI Department has shifted its training and research goals towards the modelling of complex systems, bringing together the physical constraints and functional aspects of products and methods and the mathematical tools needed for the analysis of financial, natural and industrial risks.

The IMI Department trains high-level engineers possessing exceptional specialised mathematical skills and able to adapt to a constantly changing technical and economic landscape, to trigger innovation and tackle multidisciplinary challenges.

**Induction week “Finance, risk and knowledge: the challenges of the future” :**

The purpose of this induction week is for students to meet professionals (in research or industry) and ask questions about finance and information management careers. It is restricted to Year 2 students.

The first part of the week focuses on the presentation of different applications of financial mathematics, from modelling to practical applications. After an introduction to financial mathematics (CERMICS), the links with energy markets are explored (GDF-SUEZ), and then different engineering jobs, including risk management in finance, are presented (Société Générale, Moody’s France, AXA).

The second part of this week is dedicated to information management, through the protection of multimedia content (ENS-CNRS-INRIA), compressive sensing (ENSAE) and very large database management (Telecom ParisTech ; EXALEAD).

Three major themes are thus considered. The first is the management of large databases and the associated indexing problems. The second relates to the storage of this data. And the final topic considers the security of digital communication.

This week covered two components of the IMI Department’s programme, first “quantitative finance” and second “vision and learning”

**Induction week dedicated to “risk in all its forms”**

In September, the IMI Department designed and organised a cross-disciplinary induction week on the topic of risk for students in the School’s six departments. The purpose of this week was to enable the students to grasp the different facets of risk, to acquire a technical and scientific vocabulary on the notion of risk and to understand the varied dimensions – mathematical, economic and psychological – of risk, then to see what it represents in the engineering fields. 233 students took part.

### “Quantitative finance” induction week

This week is addressed to third year students at École des Ponts ParisTech. It is also open to Masters degree students working on Applied Mathematics in Finance (UPEMLV, École des Ponts ParisTech).

The purpose of the event is to organise meetings with market finance professionals.

Careers in this field are also explored, but the lecturers focused mainly on practical cases to elucidate the relations between the theoretical content of the classes in the Applied Mathematics in Finance Masters programme and the practical problems that students will face in their first jobs (where applicable).

This week provided an opportunity for the practical implementation of modules in the IMI Department’s “quantitative finance” programme.

### Department trip to Bordeaux

The purpose of this week-long trip is to show students the advantages of research-based training and of research careers either in academia or industry.

The students attended several lectures and toured the Atomic Energy Agency’s Mégajoule laser site and the INRIA-Bordeaux South-West research centre.

They also met engineers from a SME that produces tailor-made, user-ready visual simulation and virtual reality solutions.

Finally, a meeting with the region’s economic actors was organised as part of the trip.

This week of travel illustrated, through examples, two elements of the IMI Department’s work, “numerical analysis” and “optimisation”.

### Pride of place to students

**Charles Gorintin**, a student in the IMI Department (Class of 2011), won first prize in the competition organised by the International Association of Financial Engineers.



### Economics, Management, Finance – SEGF.

**Chair: Pierre Jacquet, chief economist of the French Development Agency (AFD), succeeded in February 2013 by Dominique Jacquet, University Professor (Nanterre-La-Défence, Insead)**

**Academic Director:**

**Annie Soriot**

**Student numbers**

**2012-2013: 130 students**

The École des Ponts ParisTech’s SEGF Department is the heir to a long tradition of training engineers in economics, starting with Jules Dupuit’s pioneering early 19th-century work on the benefits of public works. Many graduate engineers from the School are renowned economists (public economics, information and decision strategies, finance).

The new economic and financial challenges are linked with **sustainable development** (concerted international action, global public goods, biodiversity protection, climate change, development), but also with the sources, governance and regulation of finance for economic activity.

The objective of the Department is to train working financial engineers and economists, by combining scientific and technical skills with economics and social science for direct action and decision making. The

jobs the Department prepares people for range from financial analysis to structured derivatives, economic forecasting, public policy analysis, strategic consultancy, project financing and sectoral economics (energy, development, environment, transport...). In addition, certain students go on to complete a PhD on themes as diverse as the economics of networks, the operation of the financial markets or international development.

Apart from courses in the specialist field, the Department also provides crosscutting training for all students at the School in general economics and business management.

### Change of Chairman

On 28 June, the School organised a farewell drinks party for Pierre Jacquet, a teacher at the School for more than 20 years and Chairman of the Department. This event was attended by the staff and several figures from the higher education and research world. Pierre Jacquet is now Chairman of the Global Development Network, an international organisation based in New Delhi, India. Dominique Jacquet was appointed Chair of the Department by the School’s Board of Directors in February 2013.

### Memorable induction weeks

- **European Issues Seminar: “Euro and debt crisis(crisis)”** (13 to 16 February). Run every year and open to all, this seminar provides perspectives on the construction of Europe and the big issues it faces (economic, institutional and social governance, demographic changes...). In 2012, the subject of the seminar was the mechanisms of the sovereign debt and Eurozone crises. Speakers included well-known economists, experts from the rating agencies and banks, journalists, philosophers and politicians.

- **Sustainable Development and Globalisation seminar in Geneva** (23 to 27 September): The purpose of the SEGF Department trip is to illustrate the scientific, economic and social reality of the concept of globalisation. A trip to Geneva, mecca of international governance, gave the students an opportunity to understand the complexity of multilateral decision-making and action, as well as to flesh out their theoretical ideas about the importance of understanding the institutional context. This seminar included two days at the public forum of the WTO (this year’s topic: Is multilateralism in crisis?), two days visiting three specialist United Nations agencies (ILO, WHO, UNHCR), and a half-day lecture-debate led by the Observatoire de la Finance on the difficulty of regulating the international financial sector. Our students were able to explore issues new to them, linked to the challenges of interdependence and globalisation, collective action and international negotiation, subjects fundamental to the intellectual openness of engineers and more generally of any world citizen. Following this trip, the students produced posters setting out the issues, which were displayed in the School hall in partnership with the Lesage Library.

- **Seminar on Economic and Strategic Intelligence (1 to 5 October)**: for the 6th consecutive year, this seminar provided the Department’s students with information on the protection and manipulation of strategic and financial information, together with issues associated with intellectual property.

### The SEGF Department film club

As part of Pierre Jacquet’s course in Political Economics, the Department organised viewings of documentary films on unfamiliar aspects of contemporary economics. In 2012, **Cin’éco showed films**:

- about the underside of the sub-prime crisis (March): **Inside Job**, a film by Charles H. Ferguson (2011),



- about the industrial transformation of the living and social environment in China (April): *Paysages manufacturés [manufactured landscapes]*, a film by Jennifer Baichwal (Canada, 2006),
- on the ins and outs of the underground economy in the UK (May): *A very British Gangster*, film by Donald McIntyre (United Kingdom, 2007).

#### Lectures

- **Detailed panorama of the insurance world** (March): lecture by Valéry Jost (Agipi/AXA) on insurance mechanisms and their role in public policy,
- **Volatility of farm prices in developing countries** (March): lecture by Pierre-Emmanuel Darpeix (Ponts/PSE) on food crises and government interventions in food markets,
- **Fragile states and development** (May): lecture by Xavier Devictor (World Bank).
- **The energy markets in Europe** (December): lecture by Jordan Cartier (MEDDE) on the role of the regulator in energy markets (morning) and lecture by the Sia Conseil agency on the experiment in energy trading simulation (afternoon).

#### Newsletters

- The « **Newsletter Livres** » [books newsletter] (2 issues in 2012): in partnership with the Lesage Library, the Department regularly proposes a selection of books on current economic and social themes.
- The « **Newsletter Métiers** » [careers newsletter] (2 issues in 2012): this newsletter focuses on the careers of two former students (one economist and one finance engineer) who describe their careers and explain their current jobs



#### City, Environment, Transport – VET

**Chair: Pierre Sallenave, Professor and General Manager of the National Urban Renewal Agency**  
**Academic Director: Joachim Broomberg**  
**Student numbers 2012-2013: 37 students**

#### New chair

The launch of the chair on “Reinventing stations in the 21st-century”, sponsored by Gares & Connexions, which will have a teaching section within the VET Department.

#### Dual engineering syllabus specialising in Rail Transport

After a year training as an engineer in the VET Department and a long internship in transport, 2 VET students were admitted to the postgraduate Masters degree on “Rail and Urban Transport systems” in 2011-2012. A further four new applicants were admitted in 2012-2013.

#### Seminar on “Sustainable Development: analyses and actions”

The VET, Year 1 and GI Departments designed and organised the seminar for Year 1 students, consisting of 2 lectures and 12 workshops.

#### Lectures

- “**Sustainable development or how to reconcile different interests?**”, with Dominique Hoestlandt,

former director of École des Ponts ParisTech, former Deputy CEO of Lafarge, former chairman of UNICEM (National Union of Quarry and Construction Materials Industries); Gaël Virlovet, Adviser at the Economic Social and Environmental Council, Head of Économie de France Nature Environnement, Dominique Olivier, CFDT Union General Secretary responsible for Sustainable Development.

- “**Taking account of sustainable development: a profound change in the engineer’s role**”, with Claude Nahon, Director of Sustainable Development at EDF, Christian Caye, Sustainable Development Director at Vinci, Pierre Sallenave, Chairman of the VET Department and chief executive of ANRU (national urban renewal agency).

#### Choice of 12 workshops (4 workshops per student):

- Aeronautical Design and Sustainable Development
- Building and Sustainable Development
- Transport and Sustainable Development
- Sustainable development, a fiction for the countries of the South?
- Sewage management in the inner suburbs of Paris. Expected and unexpected prerogatives of a process owner: Val-de-Marne General Council.
- Urban agriculture: its role in tomorrow’s sustainable city.
- “Sparknews: sustainable development and “Impact Journalism”. Video illustrations.”
- “Carbon Audit: what business challenges for companies?”
- “Development of sewage management models in the Paris conurbation associated with the Grand Paris programme”
- Corporate social responsibility (CSR),
- Regional climate-energy plans: a necessary source of motivation but a problem in the light of actual local capacities,
- Why should people pay for water in Africa?

#### Memorable exposure weeks

- Study trip on “the challenges and careers associated with urbanism and the environment: 5 days in Stockholm (in English) and 2 days in Dunkerque.
- “Transport-related issues and jobs”: students were offered a totally remodelled version of transport week. On the menu:
  - Student induction, explanation of the Department’s role
  - Issues and jobs in each transport mode
  - Issues relating to passenger mobility and freight transport
  - Feedback - IDEA “Mobility” week run by Department students
  - Transport and Sustainable Development
  - Systemic Approach
  - Quality of service
  - Road Safety - introduction
  - Key figures and global challenges
  - Environment and road safety
  - Road safety - urban context
  - Technical tour: City of Paris
  - Transport and Safety
  - Careers in transport services

## 2012 highlights

### Double-degree with HEC

École des Ponts Paris Tech signed a partnership with HEC which allows HEC students to obtain a double degree after 5 years (3 years at HEC and 2 years at the Ponts) and students at the Ponts to do the same (3 years at the Ponts and 2 years at HEC). At the School, HEC students can apply for all the specialist subjects, even if some of them are long way from their core field.

### Solar Decathlon 2014

At the end of the year, Université Paris-Est was successful in its application for the Solar Decathlon student project to be held in Versailles in 2014.

The School is playing an important role in this project, which will involve students from the GCC Department and other departments in building a house in Versailles, with a surface area of around 100 m, to meet 10 sets of criteria, with a particular emphasis on energy efficiency.

### educnet.enpc.fr: e-learning to support live learning

The Moodle-based platform educnet.enpc.fr is now a standard instrument in the School's learning toolbox. The number of individual users per month using educnet was 240 at the beginning of 2011, 650 at the beginning of 2012, 740 at the beginning of 2013. Every new module leader is given a demonstration of its use and training courses are now held at the beginning of every semester.

### Towards a systematic assessment of engineering courses

The assessment of the GMM engineering syllabus has been finalised. This first assessment concluded that the approach was effective and that it would be advantageous to evaluate another engineering syllabus.

### Award of engineering degrees and prizes

On 15 June 2012, 255 students were awarded their engineering degrees, including 61 double degrees. The ceremony was attended by a figure of **great distinction**: **Patrick Pélatà**, former adviser to the Chairman of RENAULT-NISSAN BV and former Chairman of the School's Board of Directors.

**Perronet (1708-1794): Excellence Prize: Claire Lebarz**, engineering student in the SEGF Department.

**André-Pasquet (1918-2006): Excellence Prize: Joël Hamann**, engineering student in the VET Department. This prize is awarded to the best performing engineering student in the «bridges, water and forests» category.

**Augustin-de-Betancourt (1758 - 1824): Excellence Prize: Marie-Ange de Boutray** student in the Industrial Engineering Department. This prize goes to the best performer in the "double-degree student" category.

**The year's thesis prize (for theses presented in 2011)** was awarded to **Nicolas Oppenchaim (LVMT)** and **Sébastien Brisard (Laboratoire Navier)** for their respective theses on: "Day-to-day mobility, socialisation and segregation:

an analysis based on the ways of life of teenagers in Urban Priority Zones" and "Morphological analysis and numerical homogenisation: Application to cement paste".

**Best scientific internship prize** awarded to **Simon Lambert** for his internship on the construction of information on ground impermeabilisation based on topographical data in a GIS

**The Jacques Coiffard scholarship** awarded by Fondation des Ponts to **Etienne Albenque**, student in the GCC Department (class of 2012) for his third-year project at the Lausanne Federal Institute of Technology in the Civil Engineering Department.

### Support for international exchanges by the Fondation des Ponts

32 first-year students received financial aid from Fondation des Ponts to develop their knowledge by pursuing their scientific internships abroad. These students are currently interns in foreign laboratories at institutions such as: McGill University in Montréal, Innsbruck University, Obernach TU, Tongji University in Shanghai, Madrid Industriales, "Caminos" School in Barcelona, the Universities of Athens, Volos, Budapest, Pisa, Warsaw, Lausanne (EPFL) and the Geneva Institute of Higher International Studies. This support, a total of €12,600, was possible thanks to the generosity of School alumni and their commitment to future graduates.

### Programme of the "Café des Sciences" lecture series in 2012:

"Café des sciences", a series of lectures run at École des Ponts ParisTech, is open to everyone (students, teachers, researchers, staff and the public). The aim of these encounters with figures from the scientific, political and cultural world is to help open up the range of scientific discoveries and their practices.

- "**Challenges and innovations in the habitat of the future.**" **Guest speaker: Didier Roux**, Director of Research and Innovation at Saint-Gobain, member of the Academy of Sciences, 13 January;



Graduation Ceremony 2012

- **“Male-Female; the construction of difference.”** Guest speaker: **Françoise Héritier**, world renowned anthropologist and ethnologist, honorary professor at Collège de France, 9 March;
- **“Waking the demons: the Euro crisis and how to survive it.”** Guest speaker: **Jean Pisani-Ferry**, Director of BRUEGEL, Centre for research and debate on economic policies in Europe; he is also an assistant professor at University Paris Dauphine, 23 March;
- **“20-year-olds in politics: youth participation in politics”.** Guest speaker: **Anne Muxel**, doctor of sociology and Director of research at CNRS in political science at CERIPOF (Political Science Institute research centre), 27 April;
- **“Speaking the world: new territories for the strip cartoon.”** Guest speaker: **Benoît Peeters**, philosopher,

writer, cartoon script writer, filmmaker, deviser and manager of a wide range of creative and artistic projects, 25 May;

- **“Optimum transport and curvature: when Monge meets Riemann.”** Guest speaker: **Cédric Villani**, specialist in analysis, who has worked on problems arising from statistical physics (Boltzmann equation, Landau damping), optimisation (Monge’s optimum transport problem) and Riemannian geometry (Ricci curvature). He was awarded the Fields medal in 2010, 30 November;
- **“End of the world? The apocalypse as seen by scientists.”** Guest speaker: **Fabrice Mottez**, astrophysicist and plasma physicist, CNRS researcher at the Laboratoire Univers and Théories (LUTH – Observatoire de Paris), 21 December.

### Distinctions

**Jean Gerald**, civil engineer at the Central Armaments Department and assistant professor at the School, was awarded the Legion of Honour Medal on 14 June by Vice-Admiral Olivier LAJOURS, at a ceremony where the School was represented by Alain Ehrlacher, Chairman of the GMM Teaching Department.

Jean Gerald is a well-known specialist in the sizing of large metal structures, in particular under stress. He is deputy chairman of the International Institute of Welding’s XV Committee on “design and manufacture of welded assemblies”.

**Gabriel Dupuy**, was awarded an honorary doctorate on 2 November at the University of Montréal for his contribution to urbanism. Gabriel Dupuy, an engineer and doctor of applied mathematics and of sociology, holder of a PhD in humanities, completed his term as a professor at the School last year, after 30 years of service. He was Director of Education at the School from 1980 to 1985.

### Order of Academic Palms (awards of 14 July 2012): proposed by the Director of École nationale des ponts and chaussées:

- **Jean Salençon** : honorary professor at the School, former Chairman of the Academy of Sciences, was promoted to the rank of Commander of Academic Palms, in particular for his research on the mechanics of deformable materials and his teaching activities, which are greatly appreciated by our students.
- **Marie-Ange Cammarota**, honorary professor at the School, former Deputy Director of International Relations and head of the Languages Department, was promoted to the rank of Officer of Academic Palms, in recognition of her commitment to our institution and her pioneering role in the French engineering schools’ international relations.
- **Selma Abbas**, head of pedagogical resources in the Education Department, was named Knight of Academic Palms, in recognition of her commitment to the School and her contribution to the delivery of its teaching programmes.



Wellness Center opened in Solidays festival in June 2012



Sports tournament ParisTech

## Teachers at the “École nationale des ponts et chaussées”

### Faculty departments

|                          |        |                           |              |
|--------------------------|--------|---------------------------|--------------|
| Andrieux Stéphane        | GMM    | Jaeger Jean-Marc          | GCC          |
| Bally Vlad               | IMI    | Jeannot Gilles            | SHS          |
| Benoit Michel            | GCC    | Jelassi Tawfik            | MBA          |
| Bisch Philippe           | GMM    | Jourdain Benjamin         | IMI          |
| Bocquet Marc             | VET    | Lafourcade Miren          | SEGF         |
| Bonneau Fabrice          | GI     | Lapeyre Bernard           | IMI          |
| Brocato Maurizio         | GCC    | Larivière Maurille        | GI           |
| Cances Eric              | Year 1 | Legoll Frédéric           | IMI          |
| Carassus Jean            | SEGF   | Lelièvre Tony             | IMI          |
| Caron Jean-François      | GMM    | Lescouarc’h Yvon          | GCC          |
| Chabard Jean-Paul        | GMM    | Leurent Fabien            | VET          |
| Chancelier Jean-Philippe | IMI    | Lyonnet du Moutier Michel | SEGF         |
| Château Xavier           | GMM    | Magnan Jean Pierre        | GCC          |
| Cohen Simon              | VET    | Mangin David              | VET          |
| Cojean Roger             | GCC    | Maruani Alain             | Year 1       |
| Combault Jacques         | GCC    | Nakhla Michel             | GI           |
| Courtier Philippe        | GMM    | Pave Francis              | SEGF         |
| Coussot Philippe         | GMM    | Pecker Alain              | GCC          |
| Crague Gilles            | SHS    | Peuportier Bruno          | GCC          |
| Cui Yu Jun               | GCC    | Ralle Pierre              | SEGF         |
| De Buhan Patrick         | GCC    | Roche Pierre-Alain        | VET          |
| De Coninck Frédéric      | VET    | Sab Karam                 | GMM          |
| De Lara Michel           | SEGF   | Sallenave Pierre          | VET          |
| Delage Pierre            | GCC    | Savy Michel               | VET          |
| Delmas Jean-François     | IMI    | Schertzer Daniel          | GMM - MPAPDD |
| Dormieux Luc             | Year 1 | Schwartz Dominique        | MAP          |
| Duceau Eric              | IMI    | Seigneur Christian        | VET          |
| Duhamel Denis            | GMM    | Sulem Jean                | GCC          |
| Ehrlacher Alain          | GMM    | Tassin Bruno              | VET          |
| Ern Alexandre            | Year 1 | Thisse Jacques Francois   | SEGF         |
| Eschenaueur Jörg         | DFL    | Torrenti Jean Michel      | GMM          |
| Fender Michel            | GI     | Trancart Jean-Luc         | VET          |
| Flam Gilbert             | SEGF   | Valette Jean René         | SEGF         |
| Flichy Patrice           | GI     | Vaudeville Bernard        | GCC          |
| Forêt Gilles             | GCC    | Virlogeux Michel          | GCC          |
| Frank Roger              | GCC    | Wieser Philippe           | VET          |
| Gallon Stéphane          | SEGF   |                           |              |
| Gloter Arnaud            | IMI    |                           |              |
| Guerinet Michel          | GCC    |                           |              |
| Hourcade Jean-Charles    | SEGF   |                           |              |
| Jacquet Dominique        | SEGF   |                           |              |
| Jacquet Pierre           | SEGF   |                           |              |



# Internships and career guidance

## Missions of the “Internships and Career Guidance” (SOP) service

### Student degree programmes are punctuated by a range of placements and internships:

The training of a high-level engineer, or a Masters degree or Specialist Masters degree student, demands the acquisition of extensive scientific and technical knowledge, but also practical professional experience. At the School, familiarity with fieldwork and good people skills are as important as knowledge of theory. The Internships and Career Guidance (SOP) service manages the first and second year internships in the engineering degree programme.

To take on a student for an internship, a Volunteer for International Experience (VIE) or End of Course Project (PFE), companies are invited to post their offers on the School’s website where students can select and consult them. More than 25% of students find their placements via this method.

### Work experience, an immersion placement in an unskilled role:

In this 4 week placement, at the beginning of the first year, all students experience the world of work in an operational role (industry, public works, supermarkets...). This placement provides a genuine life experience for students, combined with a first look at **how the working world and its actors are structured.**

### Initiation to research: the first-year scientific internship (April to July)

This initiation into research takes place in public or private research facilities, in France or abroad. As an initiation to the world of research, it exposes students **to new working methods:** experiment, analysis and evaluation of results, immersion in a research community. The Internships and Career Guidance Department identifies topics **accessible to first-year students** from laboratories and research centres in France and abroad.

### Work experience: the long internship

Although optional, the long internship (minimum 10 months) between Year 2 and 3 is popular among students of École des Ponts ParisTech: around **80% of each intake do a long internship.** It is one of the strengths of an engineering degree and students like it not only for the experience of a real job, but also for the knowledge and understanding of the industrial world that they acquire, which forms a grounding for their future career choices. 30% of students chose to do their internship in Europe, the USA, South America, the Middle East, Africa, Australia, New Zealand or Asia. Some students opt for the short engineering internship during the **2 summer months** (20% of these

take place abroad) to carry out a specific operational task in a novice engineer role.

### Third-year internships for polytechniciens:

École Polytechnique students, admitted to École des Ponts ParisTech on the basis of their qualifications, follow a short, so-called “further integrated” course. Their research internships are jointly managed by the two Schools.

### The end-of-course project (February to September):

The end-of-course project (PFE), undertaken at the end of Year 3, is the final stage of education before entering the working world. It takes place in a company or research organisation. The PFE differs from an internship in its academic objectives: it is about doing an individual piece of work, applying the knowledge acquired during training and expressing qualities of imagination, curiosity and scientific rigour, whilst at the same time generating the value expected by the host establishment.

The PFE is overseen by a project director, a teacher at the School approved by the Chairman of the relevant department. It concludes with a written dissertation, which must be defended before a panel consisting at least of the Chairman of Department or his/her representative, the Project Director and a scientific adviser representing the host organisation.

### The Career Guidance Programme (POP)

To support students in their search for internships and their move into the professional world, the SOP has set up a career guidance programme (POP) which provides services based around 3 major priorities: practical help in finding an internship or job, the design and management of individual career plans, information about careers through interchanges with graduates. In the career guidance programme, the SOP cooperates closely with the Graduates Association to offer students a wide range of support relating to jobs and career planning.



Lecture Guillaume Pepy, Chairman of SNCF

**Events in 2012 included:**

- “Ethics in business”, with Étienne Cunge (Environment and Sustainable Development Coordinator, Artelia Group), 23 January;
- “What is a good internship?”. RESTAG (Internships and Governance Study Network), of which École des Ponts ParisTech is a founder member, organised a day of study on 23 March;
- “Changes in the railway system and its new challenges” with Guillaume Pepy, Chairman of SNCF, 11 May;
- “What if we trusted entrepreneurs?” with Xavier Fontanet, Honorary Chairman of Essilor, 12 October.

**Relations with business**

The SOP is the primary point of contact with companies and their human resources departments. Coinciding with the introduction of the new **Focus Métiers** partnership, offered to companies to promote their career offers and raise their profile with students, the SOP has helped to strengthen relations with Accenture, Areva, Artelia, Banque de France, Boston Consulting Group, Bouygues Construction, Bureau Veritas, Cap Gemini, EDF, Eiffage, Ingerop, Leon Grosse, McKinsey, Renault, SNCF, Systra, Vinci...

**OUR “FOCUS METIERS” (CAREER FOCUS) PARTNERS.....**



**OUR “FOCUS METIERS” PARTNERS and YEAR SPONSORS**



Sponsor of the Class of 2015



Sponsor of the Class of 2014



Sponsor of the Class of 2013

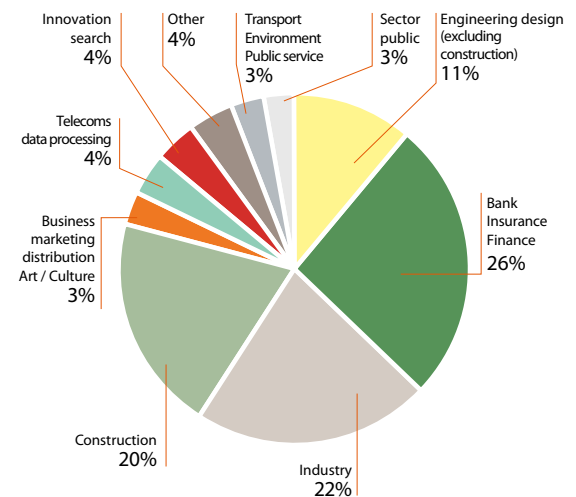
**Job opportunities**

2013 survey of 2012 graduates (excluding public service personnel)

Average first salary:

**Basic: €42.1 K**

**With bonuses: €46.7 K**





## Student life



### The Student Union plays a central role in student life

École des Ponts ParisTech has a very rich student life encompassing a wide range of activities (humanitarian, sport, culture, music... ). They include: BDE, BDS, Forum Trium, DévelopPonts,

the humanitarian and community Association and Ponts Études Projets, the School's Junior-Entreprise.

The central catalysing component is the BDE (student union), which encompasses some 50 different clubs, coordinates their activities and handles their relations with the School's management, administration and partners

### It performs multiple roles:

- managing student accommodation, in coordination with the Student Office,
- hosting entrants for the joint Mines-Ponts examination,
- organising the School's internal student festivals,
- managing the School's clubs (theatre, astronomy, online gaming, photography...),
- linking businesses and students,
- simplifying day-to-day life for students and providing services (photocopying, group purchase of transport or cinema tickets, reduced price newspapers, preferential travel rates...),
- managing subscriptions to the School's pay-for-use broadband network...

### 2012 highlights

#### Summary of the initiatives conducted by the BDE "Marsuponts'lami" elected on 13 January:

- **welcoming School applicants:** organisation and welcoming of school applicants from 20 June to 22 July; production of a leaflet and presentation film, hosting services (accommodation, breakfast and barbecues)...
- **induction weekend:** Year 1 students welcomed and mentored by Year 2 groups (in concert with the administration). Foreign students were also invited to this weekend, which took place near Niort.
- **club activities:** the year 2012 was marked by the organisation of monthly wine appreciation sessions, led by M. Lepré, a well-known professional wine expert.
- **travel:** organisation of 3 trips, to Prague, Berlin and Lisbon.
- **communication tools:** launch of a new website, management of a dynamic Facebook page ("BDE École des Ponts ParisTech") with 620 student members.
- **Ponts Alliance:** BDE is a stakeholder in all its actions and initiatives (participation in its monthly meetings and AGM, involvement in career evenings, subscription campaign, coaching events...).
- **ParisTech:** participation in Union ParisTech and ParisTech Night, cooperation with the online magazine ParisTech Review, development of shared databases...
- **Theatre Club:** Israël Horovitz's comedy "Le Premier" was staged at 9 pm on 2 April in the Cauchy Amphitheatre.

- **Sailing:** "Tous sur le Pont !" (everyone to the bridge!), The School's Sports Office's sailing club took part in the 44th EDHEC Cruiser Race, Europe's premier student sports event, which ran from 13 to 21 April. Starting point, la Rochelle. The race could be followed live on the School's website [www.enpc.fr/tous-sur-le-pont](http://www.enpc.fr/tous-sur-le-pont)

- **Gala 2012 :** this took place on 30 March at Maison de l'Amérique Latine. On the menu: fashion parade, buffet dinner, dance, concerts, theatre, comedy, tombola...

- **Increase in the number of initiatives organised with companies in various sectors (consultancy, civil engineering and finance):** lectures on Friday midday and Tuesday evenings, cooking classes (with Total), mock interviews and case studies.

### Focus on flagship community projects:

In 2012, the BDE added a new club: Jardin Pontanique. Located behind the new Descartes+ building, it is dedicated to organic vegetables, bushes, plants... It is open to anyone who loves plant growing and gardening students, researchers, teachers or administrative staff. The planned crops are many and various (vegetables, green compost, herbs, fruit, flowers and decorative plants...).

### DévelopPonts, the humanitarian association:

- **public report on 4 April 2012 on activities in the "Expérience Ouverture" (inclusion experience) programme:** it was attended by schoolpupils, school directors and teachers involved in the "Expérience Ouverture" programme. In 2011, more than 130 such schoolpupils were assisted and supported by 20 Year 1 student volunteers from École des Ponts ParisTech:
- 80 received **educational support** at their schools every Thursday evening,



- 50 took part in **themed tours and cultural or scientific outings**.

Throughout the school year, through visits to museums, laboratories, industrial sites and meetings, they were introduced to the world of engineering via topics associated with the City and its major challenges (energy supply, transport, public services and “community”, urban ecology, waste management, urbanism...). In front of their parents and figures from the academic and political world, these young people talked about the experiences they had enjoyed and the broader horizons they had encountered.

- **7th Handivalides event**, organised by DévelopPonts with the help of the Starting Block Association on 26 March at the School. This was a day of awareness raising on access

to education for young people with disabilities. Teachers, administrative staff and students were invited to the School's hall to take part in workshops and a debate on the theme of “Disability and Higher Education”.

- **Participation in the FEDEES Challenge Day** in November. This is a challenge thrown down to 8 business and engineering schools to fund 16 micro-entrepreneurs in 24 hours, using [babyloan.org](http://babyloan.org), Europe's first community microcredit website. Students could lend as much as they could afford to contribute to this new “interschool competition”. The DévelopPonts team managed to put together €525!
- In March, DévelopPonts launched the first edition of its newsletter.

## Other School highlights in 2012

### Armel de La Bourdonnaye appointed Director of École nationale des ponts and chaussées

Armel de La Bourdonnaye, a 48-year-old civil engineer, was appointed Director of École nationale des ponts and chaussées by a Presidential Decree. He took office on 1 August. He succeeded Philippe Courtier, who was appointed Chief Executive of EM LYON (former Sup de Co Lyon).

Head of the Department of Transverse Organisations and Large Research Infrastructures at the Ministry of Higher Education and Research since 2010, Armel de La Bourdonnaye graduated in engineering from École polytechnique and École nationale des ponts and chaussées, and has a PhD in applied mathematics from École polytechnique. He is also an accredited research supervisor.

With a full understanding of the current challenges of higher education and research, Armel de La Bourdonnaye is also familiar with École nationale des ponts and chaussées, having been its Director of Research from 2004 to 2008.

He began his career as a researcher at ONERA (1989-1991) then at INRIA, where he became deputy laboratory director (1991-1999). From 1999 to 2001, he was deputy head of the technical department for electrical energy and big dams at the Ministry of Economics, Finance and Industry, then adviser to the Ministry of Transport, Infrastructure and Housing (2001-2004).

In 2008, he joined the central research and innovation division as head of the coordination and transverse policy department, where he worked notably on the national research and innovation strategy and the Future Investments Programme. Then in 2010, he was appointed head of department for transverse organisations and large research infrastructures where, amongst other functions, he was responsible for oversight of the CNRS, CEA and ANR, research organisations. Since March 2012, he has also been deputy chairman of the European Council's high-level joint programming group.

On 28 June, the School organised a farewell drinks party for Philippe Courtier, who had headed the School for 8 years. This event brought together the staff and several figures from the higher education and research world. To show its gratitude, the School awarded the

outgoing director the School Medal and a framed reproduction.

### Tribute to Malika Kadri

It was with great sadness that we learnt of the sudden death on Tuesday 30 October 2012 of Malika Kadri, Academic Director of the Mathematical Engineering and Computer Science Department.

With a PhD in Chemistry and Physics from University Paris XI, Malika KADRI taught at the University, as well as Paris XIII, ESIEE Paris and École Supérieure des Techniques and Économie de la Construction, before joining École nationale des ponts and chaussées in March 2008 as head of pedagogy at the IMI Department. In spring 2011, she took on the post of Academic Director of the Department.

She will be remembered by her colleagues, and the teachers and students of the School, as a person remarkable for her commitment, the talent with which she ran the Department and organised its courses, her great concern for other people and her exceptional human qualities. The School would like to pay tribute to an individual who was unanimously appreciated by her colleagues, and whose death has profoundly affected us.

### Université Paris-Est

In institutional terms, the incorporation of the School into the Université Paris-Est (research and higher education cluster) has confirmed its role as a special centre for the development of research. Moreover, in keeping with the priorities set by the Board of Directors, a structural partnership with **IDEX PSL\***, more specifically targeting the training of engineers, is currently in preparation. As of 31 December 2012, 3 ParisTech member schools were associate members of PSL: ESPCI ParisTech, Chimie ParisTech and MINES ParisTech.

### Social inclusion and social diversity initiatives:

The tutorship programme – “**Expérience Ouverture**” – set up by École des Ponts ParisTech and the student association DévelopPonts, for secondary school pupils in the Seine and Marne Department, grew from **15 pupils** in 2009/2010 to more than **130 in 2012** receiving assistance and support from **25** first-year student volunteers at École des Ponts ParisTech:

- 75 received **educational support** in maths, physics and chemistry at their schools every Thursday evening,

- 55 are involved in a scientific ideas and awareness raising process constructed around **themed visits and lectures**.

The goal is to develop links between the School's students and secondary school pupils from priority education zones, to introduce them to the different sectors of higher education, to help motivate them towards potentially highflying careers and to demystify higher education in order to combat the phenomenon of self-censorship.

To celebrate **the Cordées de la réussite [lifeline to success]** National Days, the School, in collaboration with Paris-East Marne-la-Vallée University (IMAC, ESIPÉ-MLV), CFA Ingénieurs 2000, ESIEE Paris, ENSG (National School of Geographical Sciences), the City & Regions School of Architecture, organised a special day around engineering as a degree and a career. The purpose was to talk to young people about the different engineering course options at Cité Descartes, to motivate them for a future career in engineering, to counter some of the myths about high-level education programmes and to combat self-censorship.

The event brought together almost **200 pupils** from secondary schools around Cité Descartes:

- Collège Armand-Lanoux in Champs-sur-Marne (77)
- Collège André Malraux – Montereau (77)
- Lycée Descartes in Champs-sur-Marne (77)
- Lycée Jean-Moulin Torcy (77)
- Lycée Gérard-de-Nerval in Noisiel (77)
- Lycée René Cassin Noisiel (77)
- Lycée Flora-Tristan in Noisy-le-Grand (93)

Pierre Léna, Member of the Academy of Sciences, Monique Létocart, Sub-Prefect responsible for city and social inclusion policy, and Bernard Saint-Girons, President of Université Paris-Est, also spoke before an audience comprising secondary school pupils, 20 headteachers, school directors and teachers, as well as several figures from the academic and political world. The Cité Descartes laboratories opened their doors throughout the afternoon to allow the pupils and their entourage to watch the different experiments, workshops and practical cases..

### “Focus Métiers” partnership

In spring, the School launched a new partnership for companies, to promote their activities, reinforce their reputation and raise their profile with students, with the aim of expanding their recruitment of future graduates of the School. Accenture, Areva, Artelia, Banque de France, Boston Consulting Group, Bureau Veritas, Cap Gemini, EDF, Eiffage, Ingerop, Leon Grosse, McKinsey, SNCF, Systra, Vinci have thus become “Focus Métiers” partners of the School, joining Renault, sponsor of the class of 2014 and Bouygues, sponsor of the class of 2013.

### Quality process:

For a number of years, the School has been involved in a quality process that accords with its strategy and in particular the current performance contract: the performance objective (No.18) is to “Bring the Quality process to fruition and strengthen the institution’s management capacities”. This objective is combined with a commitment to ISO 9001 certification in 2013.

The aims of this process are to: consolidate our management system, continuously improve our processes, continuously improve our results and particularly the satisfaction of the School’s clients and partners.

In 2012, the process was boosted by the recruitment of a quality director to the team. The mock audit conducted in March 2013 confirmed the progress of the project, with a view to certification at the end of 2013.

The main elements introduced in 2012 were the following: formalisation of an initial version of the quality documents (process mapping, process identity forms, logging systems, improvement plans); implementation of internal audits (12 internal auditors were trained, 8 internal audits were carried out); introduction of process reviews and a management review (each process owner presented their 2012 report to the Board of Directors, as well as the targets and plans for their process in 2013); introduction of a first version of the tracking system for transversal projects (25 transversal projects were identified and are being tracked at Board level).



Malika Kadri



Cordées de la Réussite National Day



# International Relations

In 2012, the School maintained its double-degree agreements with prestigious academic institutions in Europe, North America, Latin America, Asia, North Africa and the Middle East: the double-degree agreements with the Porto University engineering faculty and KTH were extended.

The School also signed a Memorandum of Understanding with GeorgiaTech's School of Civil Engineering and Environment under which, in 2013, students would be able to follow an internship in the partner institution's laboratories. We are also working on the development of a joint Masters degree in geomechanics, with the support of the researchers concerned from the two institutions.

Out of the student engineers in the Masters programme, 85 – i.e. one third of a class year – come from foreign universities.

Conversely, almost **46%** of the students entering the School via the joint examination complete their third year education in a foreign university, **75%** of them with the aim of obtaining a double degree, a significant advantage in terms of potential job opportunities.

## Student exchanges as part of the engineering training process

### 32 double-degree agreements

In 2012, 85 foreign students entered the School to study for an engineering degree. This figure is slightly up on the previous year, and represents almost one third of the year group. It comprises:

- 83 students, i.e. 5 more than in 2011, under double-degree agreements: this rise is mainly explained by the admission of a larger number of students from southern European universities (Greece, Italy and Portugal);
- 2 Chinese students admitted on the basis of qualifications within the framework of ParisTech's 9+9 co-ordinated recruitment programme.

At the same time, **47** students of the School attended a third-year degree course in a foreign university.

This international mobility takes place either within the framework of double-degree agreements signed by the School (13%), or following an individual application for Masters type courses mainly in universities in the USA (57%) or the English-speaking world (30%). This demonstrates the excellent quality of our students.

The main universities concerned are:

- in Sweden: the Royal Institute of Technology (KTH);
- in the UK: Imperial College London, The London School of Economics; Oxford and Cambridge universities; Cranfield University; London Business School
- in the USA: University of California at Berkeley; Columbia University, the destination for 15 of our students; MIT; Princeton;
- in Canada: École Polytechnique de Montréal;
- in Japan: Tokyo University and the Tokyo Institute of Technology.

## Other student exchange agreements

### Non-degree exchanges

In 2012, the School admitted 27 internship students. These students spend one or two semesters following courses that give them sufficient credits to obtain their degree in their home university. In parallel, some 15 Year 3 students of the School spent one or two semesters studying at a foreign university, half of them in northern Europe, and 45% in North America.

### Scientific internships

This year, 73 first-year students did their scientific internship abroad, 90% of them in our partners' research laboratories, mainly in Europe. Around a dozen of these students were able to do their scientific internship outside Europe (Brazil, Canada and China).

### Admission of students or PhD researchers to postgraduate training courses

Vocational and research Masters programmes: 76 foreign students (i.e. 60% of students recruited) from 24 different nationalities (Algeria – Brazil – China – Cambodia – Cameroon – Columbia – Indonesia – Iran – Italy – Japan – Lebanon – Macedonia – Morocco – Portugal – Romania – Russia – San Miguel – Slovakia – South Korea – Spain – Togo – Tunisia – Turkey – Vietnam).

Specialist Masters programmes: 47 foreign students (i.e. 23% of students recruited) from 14 different nationalities (Algeria – Belgium – Brazil – Cambodia – Cameroon – Chile – China – Lebanon – Morocco – Senegal – Spain).

MBA (excluding foreign subsidiaries):

61 foreign students (i.e. 70% of students recruited) from 24 different nationalities (UK – Colombia – USA – Cayman Islands – India – Saudi Arabia – South Africa,...).

## Participation in specific programmes

### The "China" programme

Under the double-degree agreement signed by the School with Tongji University in November 2008, 8 Chinese students were selected in 2012 to continue their education at the School, 5 in the Civil Engineering programme and 3 in the Environment programme. After completing their initial studies at their University, under the agreement they will enter the School in September 2014.

In addition, the School is part of a consortium of French schools (Groupe des Écoles des Mines; INSA de Lyon, ENTPE; ENGEEES) involved in a plan to create a new high-level Franco-Chinese engineering school specialising in sustainable development, to be set up with Tongji University.

### Japan

Under the double-degree agreements with Tokyo University and the Tokyo Institute of Technology, we admitted 4 Japanese students and sent 2 French students to Japan for academic year 2012-2013. The prospects for academic year 2013-2014 are equally

encouraging, in terms of both admissions and secondments.

5 Japanese students have been selected for the double-degree programme and the School has backed the Fondation des Ponts in its collection of funds from former students of the School to support exchanges with our Japanese partners. The School has also formed partnerships with Saint-Gobain and Air Liquide involving their subsidiaries in Japan, which enabled it to obtain funding for these students in Japan in 2013.

With the help of former students working in Japan, the School also organised a presentation of the Japanese partner universities. Some 15 students took part in this event, some of whom expressed an interest in entering the double-degree programme.

#### Brazil: the Brafitec programme

The School admitted 14 Brazilian students in 2012 (12 double-degree and 2 exchange students). At the same time, 10 students from the School went to Brazil: 94 for scientific internships and one under the double-degree agreement with São Paulo University's Institute of Technology. For the first time, the School also admitted two exchange students from the Federal University of Rio de Janeiro.

In October 2012, in concert with AgroParisTech, the School was successful in its response to the BRAFITEC call for projects launched by CDEFI and CAPES. The project was selected by the Franco-Brazilian steering committee, which will ensure the funding of academic exchanges with these universities for an extendable period of 2 years.

#### The Training Programme for High-Level Engineers in Vietnam (PFIEV)

In 2012, the School took part in several activities in

Vietnam under this programme:

- participation in the Improvement Council in Hanoi at the end of October;
- assessment of students of the Hanoi Higher School of Civil Engineering following the "Transport Infrastructures" stream.

#### Participation in international academic and professional networks

##### *EUCEET (European Civil Engineering Education and Training)*

The project presented by EUCEET in 2012 was not selected by the European Commission. The Association held its AGM in Pisa in November 2012, where it decided on its schedule of activity for 2013.

##### *T.I.M.E. (Top Industrial Managers for Europe)*

The School, a member of this network since 2007, took part in the general assembly organised by NTNU in Trondheim. This event reported on the network's activities in 2012 and set out the prospects for the association's development in 2013 and beyond.

##### *Athens: ParisTech exchange programme*

Athens week in 2012 ran from 17 November to 23 November. The School offered 6 one-week classes, 4 of them in English (98 courses in all were followed in Europe). At the School, 184 students followed the classes (59 from 10 foreign universities, 84 from other ParisTech schools and 41 from the School itself). In addition, 170 students of the School (almost exclusively Year 2 students) followed courses provided by other schools (133 chose their week of classes from other ParisTech schools and 37 abroad), spread across 10 different foreign institutions.

## The Masters programmes

### 22 vocational and research Masters programmes

École des Ponts ParisTech is licensed by the Ministry of Higher Education and Research to deliver a Masters degree. It jointly certifies or contributes to 22 Masters degrees through 3 types of partnership.

**The School jointly certifies 16 Masters degrees with universities** 11 of them run under the Université Paris-Est umbrella.

These degrees are particularly aimed at third-year engineering students wishing to complete their studies via a research programme. The fields involved are transport, water management, mathematics applied to finance, mechanics of materials and structures, organisation of production and business innovation.

- **Mechanics of Materials and Structures** with UPEMLV
- **Materials Sciences for Sustainable Construction** with UPEMLV, École Polytechnique and Lafarge
- **Mechanics of soils, rocks and structures in their environment** with UPEMLV, UPMC, École Centrale Paris and École Polytechnique
- **Heritage materials in the environment** with UPEC and Paris Diderot - Paris 7

- **Mathematics, vision, learning** with Paris Descartes and Paris Dauphine Universities, and ENS Cachan, École Polytechnique, Télécom ParisTech, École Centrale Paris and EGIM
- **Numerical analysis and partial differential equations** with UPMC, ENS Paris and École Polytechnique
- **Applied Mathematics in Finance** with UPEMLV, UPEC and the University of Évry-Val-d'Éssonne
- **Enterprise, innovation and society** with UPEMLV
- **Project financing - structured finance** with University Paris Ouest Nanterre La Défense
- **Public policy and development** with EHESS, ENS in partnership with AFD and IRD, J-PAL Europe and CEPREMAP
- **Analysis and economic policy** with EHESS, ENSAE ParisTech, ENS Paris, École Polytechnique
- **Economics of sustainable development, the environment and energy** with Université Paris-Ouest Nanterre La Défense, AgroParisTech, EHESS, École Polytechnique, INSTN, MINES ParisTech, IFP School and Université de Bourgogne



- **Transport and mobilities** with UPEC and UPEMLV
- **Cities, services, uses** with UPEMLV
- **Ocean, atmosphere, climate and spatial observations** with UPMC, ENS, École Polytechnique and ENSTA ParisTech
- **Aquatic systems and water management** with Université Paris Diderot - Paris 7 and UPEC

The School contributes to 4 Masters degrees awarded by ParisTech. These programmes are aimed particularly at foreign students and are primarily vocational in character:

- **International ParisTech / Renault Foundation Masters degree: "Transport and Sustainable Development" (TRADD)**. It is headed by École des Ponts ParisTech in collaboration with MINES ParisTech and École Polytechnique and in partnership with the Renault Foundation;
- **International ParisTech Masters degree - Water, Soil and Waste Management and Treatment (GTESD)**. It is headed by AgroParisTech in collaboration with Chimie ParisTech, ENSTA ParisTech, ESPCI ParisTech, MINES ParisTech;
- The Masters degree in **"Nuclear Energy"**. It is certified by Université Paris-Sud, ParisTech, École Centrale Paris and Supélec. It also benefits from the partnership with INSTN and the support of several industrial enterprises (EDF, Areva, GDF SUEZ). The School is responsible for the specialisation;

- The Masters degree in **"Mobilities and Electric Vehicles"** (MVE) is a new course created in partnership with the Renault Foundation and focuses on the design of electrical and mechanical systems and their interactions. It is headed by Arts et Métiers (in partnership with MINES Paristech and ENSTA ParisTech).

The School participates in 2 Masters degree programmes without joint accreditation:

- The Masters degree in **"Transport System Management and Operation"** is an international degree located at the Hassania School Public Works in Morocco and delivered in partnership with Barcelona's Escuela de Ingenieros de Caminos, Canales y Puertos and ENTPE;
- The Masters degree in **"Management and engineering of environmental services"** (MISE), delivered by UPEMLV and Université de Cergy-Pontoise and in partnership with Veolia Environnement and its training centre.

**Award of degrees**

TRADD (8th year) and MVE (2nd year) Masters degrees: the ceremonies took place on 8 December 2012 at Arts et Métiers ParisTech.

ParisTech Masters degree - "Water, Soil and Waste Management and Treatment": the ceremony took place on 13 January 2013 at Arts et Métiers ParisTech.

## Specialist Masters degrees

### 9 jointly accredited specialist Masters degrees

The specialist Masters degree, a label granted by the Conférence des Grandes Écoles, forms part of a well-defined career plan entailing the acquisition of additional training or a second skill. These degrees are the responsibility of the faculty departments. The School offers 9 specialist Masters programmes:

- **Public Policy for Sustainable Development** with AgroParisTech
- **Planning and urban commissioning**
- **European civil engineering**
- **Engineering of Large Energy Structures** with École Centrale Paris
- **Electric Vehicle Engineering** with Arts et Métiers ParisTech, ENSTA ParisTech, Mines ParisTech, in partnership with the Renault Foundation and the support of EDF and professional automotive groups
- **Global supply chain design and optimisation** with EPFL and AFT/IFTIM
- **Rail and urban transport systems** with ARF, Alstom Transport, Ansaldo STS France, Bombardier, FIF, RATP, RFF, Siemens Transport System, SNCF and SNCF International, Écoles centrales de Lille and Paris, ENTPE, ENSIAME, University of Valenciennes and du Hainaut Cambrésis and Compiègne Technological University
- **Urban engineering and information technologies** with EIVP

- **Real Estate, Building and Energy** with CSTB and CNFTP

### Specialist Masters programmes: 2012 highlights

#### 1st interactive exhibition of Écoles de ParisTech Specialist Masters programmes

Chat sessions led by the Specialist Masters team run every Thursday from 2 pm to 5 pm in ParisTech's virtual forum. They provide direct answers to potential applicants from abroad. This forum project has been developed and is run by École des Ponts ParisTech.

#### Renewal of the Specialist Masters degree in Rail and Urban Transport Systems

The agreement was renewed on 11 May, during a visit by SNCF Chairman Guillaume Pepy to meet and talk with students. The day was also marked by the signature of the renewal to this framework agreement.

This course which, since 2008, has already trained more than 140 engineers and managers, is the fruit of a partnership between 4 engineering schools (École des Ponts ParisTech, ENTPE, ENSIAME and UTC), 12 business partners (SNCF, Alstom, RATP, Bombardier, RFF, Siemens, FIF, Ansaldo-STC, EPSF, SYSTRA) and 2 competitive hubs (Advancity and I-trans).

#### Lecture on "The real estate revolution"

This lecture was organised at the CSTB at 6:30 pm on 19 September 2012 by the 2012 year group in the Specialist Masters course on Real Estate Building and Energy, as part of "France Green Building Week".

Introduction by Philippe Pelletier, Chairman of Plan Bâtiment Grenelle.

#### YouTube Channel

Spring 2012 saw the launch of the École des Ponts ParisTech YouTube channel, following the first session of shooting for 26 video interviews of students and course managers. These videos were translated and subtitled in English for better international accessibility. A second session was filmed in December 2012

#### Contribution by École des Ponts ParisTech to the creation of two new Specialist Masters degrees accredited by the Conférence des Grandes Écoles:

**“Real Estate, Building and Energy” (IBE):** The School joined forces with the CSTB (Centre for Scientific and Technical Construction), with the CNFPT (National Regional Public Service Centre) and in partnership with companies in the real estate and construction sector, to launch this new Masters programme in January 2012. The MS IBE, coordinated by the GCC Department, is a high level course lasting 12 or 18 months for working executives, which brings together actors in the real estate (finance, law) and construction (architecture, technical) sectors, to achieve ambitious performances in the energy, environmental and health spheres.

**“Public Policies and Actions for Sustainable Development”:** this is a course jointly accredited with AgroParisTech and primarily aimed at training state water, forestry and civil engineers.

#### Launch of the specialist Masters degree in Engineering and Logistical Systems Management (IMSL) in Casablanca (Morocco):

The School provides joint accreditation for this specialist Masters degree in “Engineering and Logistical Systems Management” taught at the Hassania School of Public Works. This course is designed for working managers. It has an “executive” format, with 3 days of courses per month for a period of 2 years..

#### Pride of place to students!

**Mohammed Bouallaga** (MS Rail) won the SNCF Group Trophy for his professional thesis on the lengthening of freight trains, presented in November.

**Charles Hazet**, a PAPDD Masters student (Specialist Masters degree in Public policies and actions for sustainable development, year group 12) received the **Pegasus Award** from the Pegasus network (Partnership of a European Group of Aeronautics and Space Universities).

**Eve Penillard**, a PAPDD Specialist Masters student, was awarded second prize in the **Innovation Trophy for Sustainable Development** organised by Capgemini.

#### National report on public data:

In summer 2012, 4 students in the École des Ponts ParisTech Specialist Masters programme on Public Action (**Pierre-Henri Bertin, Romain Lacombe, François Vauglin and Alice Vieillefosse**) delivered a report to the Internet Uses Delegation as part of the Proxima Mobile Gateway for citizen mobile phone services.

This report, entitled **“Public Data for Innovation and Transparency. For an ambitious policy of public data reuse”**, puts into “perspective the problems and chal-

lenges of Open Data, proposes an evaluation of the reuse of public data in France, and outlines 3 potential scenarios for the future of this movement. It puts forward 16 propositions for an ambitious national policy for the opening up and reuse of public data”..

#### Presentation of End-of-Course Projects (PFE)

Teams of students in the class of 2011 on the Specialist Masters programme in Urban Planning and Commissioning (AMUR) defended their PFE at the School on 6 December. 5 studies were presented:

- 9-10:30 am **“Seine and Marne at the barycentre of sustainable logistics”** (Partner Seine and Marne General Council). Topic: Conceiving sustainable development in business zones.

- 10:45 am-12:15 pm **“Réseau Ferré de France (French Railways), an actor in city development “** (Partner Réseau Ferré de France). Topic: Railways and conurbation strategies.

- 1:30-3pm **“Sustainable metropolisation, manifesto for the balanced development of Garges-lès-Gonesse”** (Partners SCET/Garges-Lès-Gonesse Municipality). Topic: Economic and commercial changes, what roles for the town of Garges-Lès-Gonesse within the Grand Paris dynamic?

- 3:15 pm - 4:45 pm: **“The reversible city?”** (Partner Vinci, La Fabrique de la Cité).

- 5 pm to 6:30 pm: **“Grand together!”** (Partner National Urban Renovation Agency). Topic: Urban renovation and Grand Paris: territorialisation of public policies in the East of Seine Saint Denis.

#### Degree awards ceremony:

The awards ceremony for the 2012 Specialist Masters degrees took place at the School on 20 December 2012. At this event, Fondation des Ponts awarded the Masters Prize to one of the degree recipients. The purpose of this prize is to encourage excellence and to reward the most promising young graduates with a prize that reflects the quality of their activity, both academic and personal.

On 21 March, the degree awards ceremony for the 50th year group of EIVP engineers and for the URBANTIC Specialist Masters was held in the City Hall.



Class of 2012: “Rail and urban transport systems” Masters

# ENPC MBA Paris: the 2012 highlights

Created in 1987, the AMBA accredited ENPC MBA Paris provides 7 main course programmes:

- *MBA in international Business;*
- *MBA in Technology & Entrepreneurship;*
- *MBA in Enterprise Risk Management;*
- *Tri-Continent MBA* (Paris, Philadelphia, Tokyo and Shanghai), in partnership with Temple University's Fox School of Business in Philadelphia (USA);
- *Executive MBA* (with its two-year, once a month Friday to Sunday "weekend" format);
- Doctoral training in management for Paris-Est PhD students and ParisTech member schools;
- International Management Programme (CIM): an introductory management course open to Year 2 and Year 3 student engineers at ParisTech member schools. The CIM offers two specialisations leading to a qualification: *International Business* (ciB) and *Technology and Entrepreneurship* (ct&E).

These programmes are strongly international and ally pedagogical flexibility and academic excellence, career planning and personal development, familiarisation with international affairs and the possibility of specialisation. They are taught in English by teachers from École des Ponts ParisTech and a very large majority of foreign teachers drawn from the world's best universities and business schools. The curriculum offers a wide choice of classes, combining case studies, group work and projects; it is structured into six streams:

- *International Business*
- *Technology & Entrepreneurship*
- *Enterprise Risk Management*
- *Finance & Accounting*
- *Marketing & Strategy*
- *Management & Leadership*

Since its creation, ENPC MBA Paris has been distinguished by an educational approach that reflects the international dimension of a globalised business world, the importance of strong ethical values and the mutual enrichment that comes from intercultural exchange. The School has also developed recognised expertise in the management of innovation, technologies and entrepreneurship. The goal of international expansion has been met through the launch of programmes based in China (in partnership with Tongji University in Shanghai), in Morocco (in partnership with the Hassania School of Public Works in Casablanca), and in the US (in partnership with Temple University's Fox School of Business in Philadelphia), ways for the School to export its expertise and unique approach. While these programmes share the same values and the same original ethos, each one brings its own characteristics and expertise to the local business environment. Participants in the Parisian and international programmes can easily follow one or more modules, each a week long, in another programme, thanks to coordinated timetables and the global application of the same standards of academic excellence.

In addition, MBA students have access to the exchange programmes set up with the following Schools and Universities:

- In Belgium: Solvay Business School, Brussels Free University;
- In Canada: Faculty of Business, the University of Victoria, Vancouver;
- In Denmark: Copenhagen Business School;
- In Finland: Helsinki School of Economics;
- In Greece: Athens University of Economics & Business

- Administration (AUEB);
- In Hungary: CEU Graduate School of Business, Central European University, Budapest;
- Israel: Technion-Faculty of Industrial Engineering & Management, Haifa;
- In Mexico: EGADE-ITES, Monterrey;
- In the UK: The University of Edinburgh Business School in Scotland; the Management School of Imperial College Business School in London.

For each programme, the annual intake consists of some 30 participants from 15 to 20 different nationalities. These participants have a minimum BA level qualification (under the Anglo-Saxon system) or M2 (under the European system) and significant professional experience. The full-time MBA course lasts 10 months, the part-time course 2 to 3 years, and the Executive MBA 2 years.

For the full-time MBA, the average age is 30, with average professional experience of 6 years. For the Executive MBA programme, the average age is 36 and average professional experience 11 years. The diversity of the professional, academic and cultural backgrounds contributes to the richness of the programmes and the strength of the ENPC MBA Paris network.

The cycle International Management (CIM) programme adopts the same teaching model as the MBA programme. It is open to students at École des Ponts ParisTech and other ParisTech member schools. This course reflects the growing interest in management, entrepreneurship and business administration amongst engineering students, particularly from an international perspective. It offers 2 specialisations each leading to a qualification: *Technology & Entrepreneurship* (ct&E) and *International Business* (ciB).

For ParisTech and Université Paris-Est, the doctoral level management programme is taught in English over 4 months (March to June) by teachers from world-renowned universities. The idea of this innovative programme is to give participants a "mini MBA" in order to give tomorrow's PhD researchers a grounding in business practices. PhD students who have completed this course and their thesis obtain the ParisTech label of *Docteur en entreprise*.

## 25th anniversary of the École des Ponts ParisTech MBA

The event was celebrated on 6 July at the Japanese Cultural Centre in Paris, and was attended notably by Dr. Sawako Takeuchi, chairman of the Japanese Cultural Centre in Paris and former MBA des Ponts graduate. This celebration took place at the degree award ceremony for the Full-Time and Executive MBA programmes.

## ENPC MBA Paris ranked Number 2 in the world by CEO Magazine and IGF

The International Graduate Forum (IGF) has developed a new generation of MBA rankings for CEO Magazine, which more accurately reflect the qualities and values that students seek in a business school. On the basis of a survey conducted with current and recent students, two key elements were emphasised: the quality of the classroom experience and the quality of the teaching. "Bigger is not always better, and our aim is to highlight the schools that offer exceptional value and quality, in order to widen the choices available to our readers when they take the tough decision to study for an MBA" explains Victor Callender, CEO of the International Graduate Forum.

In this ranking, ENPC MBA Paris is in second position both in the world and in Europe.

### Facts and figures on the Full-Time MBA and Executive MBA

With 37 participants from 15 different countries, the launch of the 25th year of the full-time MBA programme was again marked by the high percentage of foreign students, and once again confirms the international success of the École des Ponts ParisTech MBA programmes.

The average age of 30 and the 6 years average of professional experience, the impressive career diversity of the participants, drawn from 23 different economic sectors (high-tech, traditional industry, engineering, services, including financial services, architecture, languages, art, law, chemicals, etc.), will ensure that this 25th intake will enjoy a great wealth of professional and human interchange.

The 2012/2013 Executive MBA intake, under a double-degree agreement with Fox School of Business in the US, has 24 participants, 1/4 of them women. Participants were of 12 different nationalities, 48% from Europe (Western and Central), 4% from Canada, 40% from Africa (North and Sub-Saharan) and 8% from India. 5 participants live and work outside France (as far away as India!) and will travel to attend courses.

In this intake, participants with scientific backgrounds and engineers still account for almost 40% of the participants. The average professional experience is 11 years: with 7 participants, the financial sector is the best represented, followed by IT and telecommunications (5 participants) and Consultancy/Audit (also five participants), then energy (two) and the automotive sector (two).

### Facts and figures on the MBA des Ponts in Morocco and China:

**In Morocco:** the academic year for the MBA des Ponts in Casablanca began on 19 September in the presence of Tawfik Jelassi. This 15th year group in the programme had 90 participants, 22 of them women, 2 members of parliament, numerous directors and executives from public and private companies and several entrepreneurs. The average age of the participants was 33, and their average professional experience 10 years.

**In China:** The welcome ceremony for the 13th MBA des Ponts year group in Shanghai took place on 19 October in the presence of Armel de La Bourdonnaye and Tawfik Jelassi. There were 59 participants in this intake, 27 of them women. The average age of participants was 34, their average professional experience 10 years, and 71% of them work for multinational companies operating in China. Messrs de La Bourdonnaye and Jelassi also took

part in the MBA des Ponts degree awards ceremony for the programme's 11th year group.

### Megatrends: joint multidisciplinary research by ENPC MBA Paris and Alcatel Lucent which shows how the world is changing

Since 2011, Alcatel-Lucent and the MBA des Ponts have been working continuously on a research project entitled "Megatrends": regular creativity sessions are organised with ICT professionals, consultants, research institutes and academics. Participants from the MBA des Ponts and from Alcatel Lucent's Marketing Consumer Insight team carry out in-depth analysis and research on a wide range of data.

An initial publication highlights 7 correlated megatrends that are playing a fundamental role in transforming our lives:

- Digital Native Acceleration: the 1980s generation is moving into positions of responsibility
- Neo Urbanization: emergence of new concepts of urbanism (corridors, megacities, networked cities, rural conversion);
- Sustainable by Design: sustainable development is now an imperative for all industries;
- 168/24x7: ICT use in our 24/7 connected society;
- Rejuvenating: life expectancy is rising fast and people are living differently;
- Ed-you-cation: acquisition of knowledge through ICT outside traditional educational formats;
- Netizens to Government (N2G): emergence of a new public debate towards e-democracy.

In the next stage of the work, an 8th trend was identified:

- Device-ology: ubiquity of electronic devices and other permanently connected smart objects.

### Memorable visits

**Apart from the standard study trips to China and the US,** for the second year running, from 21 to 23 November, participants in the ENPC MBA Paris made a study trip to Sophia-Antipolis. They visited IBM's industrial centre at La Gaude, the headquarters of Texas Instruments France at Villeneuve-Loubet, the headquarters of Amadeus at Sophia Antipolis, the Fragonard perfumery, the Eco-Valley Project, the Sophia-Antipolis Foundation and the risk and crisis research laboratory at École des Mines. They also had discussions with the management of Thalès Alenia Space (Cannes) and of Team Côte d'Azur (Nice).



Graduation Ceremony 2012



## State Architects and Urbanists (AUE)



École des Ponts ParisTech, jointly with École de Chaillot, provides post examination training for State Architects and Urbanists (core subjects, courses in the “Planning” option and the whole teaching programme for AUE students).

State architects and urbanists have inter-ministerial civil service status and report to the Ministry of Culture and

Communication, the Ministry of Ecology, Sustainable Development and Energy (MEDDE) and the Ministry of Territorial Equality and Housing. In the examination, they choose a “Planning” or “Heritage” option, but they are encouraged to move from one domain to another during their careers.

This course is structured over the academic year around a three-month internship and themed semi-

nars covering the different areas of expertise, from housing to landscape. The programme ends with the presentation of an end of course project to a panel made up of representatives of the two ministries, of the schools and regional departments. Participants also take part in study trips.

It should be noted that foremost among the subjects studied by AUE students are urban development projects and the conversion and sale of State property. Environmental questions are also very high on the agenda. Since 2005/2006, AUE students have followed certain of the teaching modules in the specialist Public Action Masters programme. Classes and seminars take place at École des Ponts ParisTech and École de Chaillot.

In 2011, the Ministry of Culture and MEDDE launched an information campaign about this career path, notably to boost the number of people applying through the annual entry examination. For information, **190 AUE** currently work within MEDDE, whether at central, regional or departmental level, or within scientific and technical networks and institutions, on projects relating to spatial planning, populations, nature and landscape.



Study tour promoting London 18 May 2012



# Lifelong Learning

For more than 35 years, École des Ponts ParisTech has been running lifelong learning and refresher programmes, which is one of its essential dimensions. This activity is the primary function of the School's subsidiary, Ponts Formation Conseil, which was set up for this purpose with Ponts Alliance, also a shareholder. **With revenues of almost €14 million** (around €9 million of which is earned by Ponts Formation Conseil), École des Ponts ParisTech is the leading engineering school lifelong learning institution.

The School's lifelong learning programme does not have a permanent teaching staff. Its strength lies in its capacity to set terms of reference then to organise and run teaching activities. The topics, audiences and objectives are identified and approved by Ponts Formation Conseil's project leaders. Then, the programme is designed with an expert in the subject, and the choice of lecturers is made. The latter are drawn from a network of 1800 specialists, recognised experts in the subjects covered, professionals from the world of business, administration and research.

## Results in 2012

Despite the continuing economic crisis, Ponts Formation Conseil, which offers around **330 distinct course** subjects, held its ground. There was a slight fall in intercompany activity, but revenues held firm at €4.8 million. As for intra-company activity, it remained in line with 2011 levels, with revenues close to €3 million.

New intra-company contracts signed in 2012 included firms such as EPAMARNE, STIF, Paris Habitat and Spie Batignolles TPCI. This tailored activity widened in scope, and Ponts Formation Conseil further increased its presence in the different Public Works and Construction groups in 2012.

## Prospects

### The objectives of Ponts Formation Conseil

Our aim is to become the preferred partner for our customers around the world in our fields of professional excellence and to contribute to their commercial success by making skills a priority.

Our role is to offer courses that are consistent with the subjects taught at the School, as a core curriculum, and to enable all executives in our business sectors to access these high-level programmes.

### Setting a new strategy: new products, new domains, new alliances

The aim is to make the company more profitable, with a target of a 5% increase in the next 3 to 5 years. The first approach is to offer customers new products and services, to expand an offering that is currently confined to short courses.

These new, high added value products, will include: certificates, Masters degree modules, postgraduate qualification programmes... which will meet strong customer demand for products that can be used within the DIF (individual training entitlement) framework.

In addition, a specific product aimed at senior executives will be added to the existing offering, with its focus on middle management. There will also be an expansion in the subjects covered (nuclear civil engineering, energy and urban services).

These changes will be accompanied by alliances with other actors. Numerous approaches have been made.

### A new structure

Following the extension to the project approach, which reflects business demand, the training teams have been

structured into two business units, with their own specific markets and customers.

In parallel, the strategic support functions have also been reinforced (HR, Finance, IT).

### Presses des Ponts

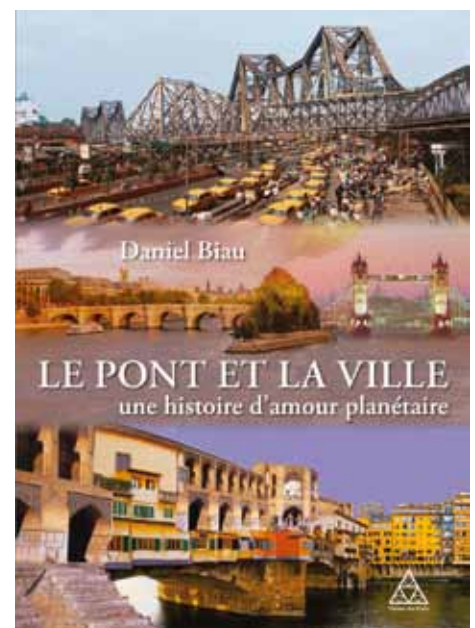
For more than 35 years, Presses des Ponts has pursued an ambitious policy of disseminating scientific and technical knowledge. Since its establishment, **it has published some 400 titles**. Its catalogue includes a collection of fine books and historical tomes, addressed to a wide readership, together with technical software applications aimed at professionals and public institutions.

In 2012, Presses des Ponts offered a catalogue of **220 books and software packages**. The new editorial policy is to position Presses des Ponts across all the School's fields of education and research. **9 new publications** were added to the existing catalogue:

- "Forages, sondages et essais in situ géotechniques", [In situ geotechnical boring, drilling and testing]
- "La physique statistique", [Statistical physics]
- "Maîtrise de la qualité en construction routière", [Quality control in road construction]
- "Projet national ASIRI (inclusions rigides)", [National ASIRI project (rigid inclusions)]
- "Procédés d'amélioration et de renforcement de sols sous actions sismiques", [Soil improvement and reinforcement processes under seismic activity]
- "Gestion des chantiers de TP et 3 ouvrages d'une portée plus large", [Managing public worksites and 3 larger structures]
- Le débat public: pour quel "développement durable", [The public debate: what "sustainable development"]
- "Stereotomy: stone architecture and new research" and
- "Le pont et la ville: une histoire d'amour planétaire" [The bridge and the city: a planetary love story]

### New course on railway bridges

On June 11 and 12 juin at Maison des Ponts, Ponts Formation Conseil offered this new course entitled "Railway bridge design and construction", addressed to everyone involved in this field. Coordinated by Bernard Gyssels and Patrick Charlon, it received contributions from representatives and experts from Eiffage TP and SNCF.



## IHEDATE (Institute for further studies in regional development and planning in Europe)

This annual course is designed for high-level executives in the public and private sectors. It comprises 12 two-day seminars, three of them specifically dedicated to social and territorial cohesion policies, a study trip and workshops for more in-depth exploration of the different subjects.

It is financed by the State (DATAR, Ministries, Caisse des dépôts), local authority associations (ARF, ADF, AdCF), private and public companies, and by professional bodies. The Institute is a non-profit association headed by Daniel Tardy.

The programme is designed and implemented by École des Ponts ParisTech and Sciences Po Paris. A committee headed by Pierre Veltz, Chairman and CEO of the Paris-Saclay Public Establishment, supported by Nadine Cattan, Laurent Davezies, Dominique Dron, Frédéric Gilli, Marie-Christine Jaillet, Patrick Le Galès, Michel Savy and Vincent Renard, is responsible for the scientific management of the Institute. The director is Philippe Estèbe, while Nathalie Leroux is the educational coordinator and Anne Oheix is in charge of education administration and logistics.

The 2012 programme attracted 67 participants (politicians, prefects, ministerial officials, heads of local authority departments, elected politicians, executives in big public and private companies, voluntary sector and union representatives, journalists...) exploring the fundamental issues of territorial development in the light of major societal changes (demographic, social, institutional, economic), in particular with the new forms of economic production. To tackle these

different subjects, the Institute brought in some 60 speakers from the academic and professional world, including several foreign experts

The destination of the study trip was Baden-Württemberg (Stuttgart and Heidelberg). Ihedate's 2012 programme, on the subject of "production and territories" clearly called for a trip to Germany. Not only because there has been constant talk of the "German model" since the beginning of the crisis, but above all because, less than 10 years ago, Germany was seen as one of the "sick men of Europe", and France's growth rates were much higher than those of our neighbour and closest partner. Back in France, nothing seems "transposable" from one side of the Rhine to the other. Above all, the trip provided a cultural and political perspective. This is the advantage of a comparative approach to European scale planning strategies. The seminar in Brussels gave the participants an opportunity to extend their knowledge of the operation of European institutions and policies. Three workshops explored the relationship between production and territories at different scales, using the European example of Milan.

In 2013, there are 64 participants on the programme. The guiding thread for the year is "time and territory", and the destination of the study trip was Poland, Warsaw and Kraków.

The course fee for the year is €5000. Applications should be sent to Nathalie Leroux.

[secretariat@ihedate.org](mailto:secretariat@ihedate.org)

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Promotion 2012

# Fondation des Ponts

This state-licensed foundation collects contributions from companies, alumni and friends of the School. In this capacity, it helps the School to play a major role in “Building the world of the day after tomorrow”.

The Foundation contributes to projects relating to educational excellence, research, innovation and international affairs in key sustainable development domains, notably the city, the environment and their engineering.

## Donors

In 2012, **18** companies and organisations contributed to the development of the School’s research, training and innovation:

ADEME  
AREVA  
BOUYGUES CONSTRUCTION  
EDF  
EIFFAGE TP  
EGIS INDUSTRIES  
EAU DE PARIS  
FONDATION ABERTIS  
HASSO-PLATNER INSTITUT  
INSTITUT DE FRANCE FEED (EDF, GDF, GRT GAZ)  
LAFARGE  
MERIDIAM INFRASTRUCTURES ADVISORY SERVICES  
SAINT GOBAIN  
SCHNEIDER ELECTRIC  
SNCF – GARES and CONNEXIONS  
THALES ANGENIEUX SAS  
TOTAL  
VEOLIA EAU

Since 2006, **455** alumni from year groups 1934 to 2013 have made donations.

At the end of 2012, these contributions represented **multiannual commitments of around €4** million for the Foundation.

Fondation des Ponts works to support projects that relate to excellence, world ranking research and innovation, international mobility, social diversity and heritage.

**In 2012, the Foundation’s involvement in these 5 areas took the following form:**

- **Excellence:** 9 excellence prizes, 4 of them through 2 academic chairs;
- **International mobility and social diversity:** 52 grants, loans and scholarships for international mobility (including the 1st scholarship awarded by Fonds Ailleret and 5 within the framework of industrial partnerships);
- **World ranking research and innovation:** 10 teaching and research chairs, including one new chair;
- **Heritage:** publication of a **work in memory of Eugène Belgrand**, issued in 2013.

**Breakdown of the use of donations in 2012: €1.5 million, net of management costs**

- 85.5%: World ranking research and innovation (Chairs and Paris-Est d.school at École des ponts)
- 0.5%: Heritage (Publication)
- 13% : International mobility and social diversity (Scholarships, Grants, loans).
- 1% : Excellence (Prizes)

## EDUCATIONAL EXCELLENCE

Since 2000, thanks to the generosity of our alumni, 4 annual prizes have been awarded to encourage educational excellence:

- **Annual thesis prize** (for a thesis presented in 2011) awarded equally to **Nicolas Oppenheim** (LVMT) for his work on “*Day-to-day mobility, socialisation and segregation: an analysis based on the ways of life of teenagers in Urban Priority Zones*” and to **Sébastien Brisard** (Laboratoire Navier) for “*Morphological analysis and numerical homogenisation: Application to cement paste*”.
- Prize for the best scientific internship (academic year 2010/2011) awarded to **Simon Lambert** for his internship project at École nationale des sciences géographiques on the “*Construction of information on ground impermeabilisation based on topographical data in a GIS (Geographical Information System)*”.
- **Masters Prize 2012** (January 2012 to December 2012) awarded to **Badr El Moujtahid** (Specialist Masters degree in “*Design and Organisation of global supply chains*”).
- **André Pasquet Prize** awarded to **Joël Hamman**, Student in the Corps des Ponts, des Eaux et des Forêts in the City-Environment-Transport Department.

**For the first year, 3 abertis Chair supported by the abertis Foundation and SANEF:**

- Thesis category: 2 prizes awarded equally to **Bassen Besbes** (INSA Rouen) for his study on “*The integration of methods of representation and classification for the detection and recognition of obstacles in road scenes*” and to **Judith Princeton** (Université Paris Est) for her work on “*Innovative practices for operating road networks associated with sustainable mobility*”.
- Masters category: prize awarded to **Guillaume Costeseque** (ENTPE, Lyon University) for his work on “*The analysis and modelling of road traffic: Moving from the microscopic to the macroscopic*”.

**This year, the 1st prize under the “Materials Science for Sustainable Development”** supported by LAFARGE, was awarded to **Anna Ramon**, a doctoral student at Barcelona UPC (Geotechnics and Geoscience Department) as part of the W(H)YDOC 2012 workshop.

**INTERNATIONAL MOBILITY AND SOCIAL DIVERSITY:  
financial support is provided to 52 students**

**8 student sponsorships through company support:**

- 3 students received financial support for their GCCGOE Masters degree course: one Spie Batignolles scholarship, one Eiffage TP scholarship, one Egis (Iosis) scholarship,
- 2 students (one in the GCC Department, another in the VET Department) received a scholarship from Meridiam Infrastructures Advisory,
- 3 Chinese students (under Franco-Chinese agreements signed in 2005) are on scholarships: 2 Bull scholarships (NTI Masters) and one SUEZ ENVIRONNEMENT scholarship (GTESD Masters)

**5 students supported under double-degree agreements with 2 Japanese universities (Tokyo Tech and Todaï):**

The Foundation has maintained its backing for the development of mobility between École des Ponts ParisTech and Japan under the double-degree agreements signed in 2010: 5 Japanese students were admitted to the School on the double-degree programme and received support for living expenses during their intensive French language course.

- **For the first time, the Ailleret Fund (Chair in Sustainability of energy-related materials and structures)** this year awarded a scholarship to Fabien Brifford for his studies for a Masters degree in Mechanical, Electrical Engineering at Tokyo University from October 2012 to September 2014 (double-degree).

**Additional support funding to 32 first-year students**

This funding was given to students for their Year 1 scientific placement abroad. Spain (7), Italy (3), Germany (2), Hungary (2), China (5), Switzerland (4), Canada (1), Greece (4), Austria (1), Poland (2).

**6 unsecured loans**

These were granted in 2012 to help fund 6 students in their third year: **Alexandre Combessie, University of Toronto** - Masters in Management of Innovation, **Amaury Rony, Cambridge, Massachusetts (USA)** - Masters in Engineering in Manufacturing, **Justine Rey, University of California Berkeley** - Masters in Science in Mechanical Engineering, **Jose Rafael Armijos Cabrera, University of Illinois at Urbana-Champaign** - Masters in Science in Civil Engineering, **El Hassani, Université de Columbia à New York** - Masters in Science in Operational Research (option Finance) and **Romain Mesnil, Cambridge University** - Masters in Engineering "High Performance Structure" at MIT.

**3 Jacques Coiffard scholarships**

These were awarded to fund 3 Civil and Structural Engineering students in their third year of study abroad: **José Rafel Armijos Cabrera** for his third year in

a Masters in Science in Civil Engineering (specialising in structures) at the University of Illinois at Urbana - Champaign, **Romain Mesnil** for his third year in a Masters in Engineering "High Performance Structures" at MIT Cambridge MA and **Benjamin Thomas** for a double-degree in "Engenharia Civil" in agreement with the São Paulo University's School of Technology.

**8 donations to the development programme for the Maison des Ponts training centre.**

**An additional donation for the dissemination of scientific and technical information.**

Lyonnaise des Eaux joined Eaux de Paris and Veolia in support of the planned publication of the book "Eaux pour la ville, eaux des villes, Eugène Belgrand XIX<sup>e</sup>- XXI<sup>e</sup> siècle".



# The School Alumni Network

## The School Alumni Network

Founded in 1860, the School's alumni association, Ponts Alliance, exists to connect the School's 16,000 graduates – Civil Engineers, State Engineers, Masters degree students, PhD researchers – and bring them the services and support they need.

The year 2012 was marked by a rise in the Association's membership, the production and circulation of two issues of the new Ponts Alliance Magazine, and by the creation of a Young Alumni group, a professional International Development group and two new geographical groups in Luxembourg and in Switzerland.

Ponts Alliance also continued its work running the graduate network, providing personal career support and follow-up, and published the 2012-2013 School Directory. The association provided support for the organisation of the School Gala and for the engineering degree awards ceremony. It also remained an active member of the School's Board of Directors and of the Maison des Ponts Management Committee in Paris.

The Ponts Alliance AGM in 2012 was held in the Navy Museum. The 2013 AGM took place on 15 May at Collège des Bernardins.

### Contacts :

Website: [www.ponts.org](http://www.ponts.org) E-mail address: [contact@ponts.org](mailto:contact@ponts.org)

Permanent Secretariat:

- Dominique Douillet, Chief Executive:  
Tel. +33 (0)1.44.58.28.38 - [dominique.douillet@ponts.org](mailto:dominique.douillet@ponts.org)
- Hanna Budzynska, directory and membership:  
Tel. +33 (0)1.44.58.28.37 - [hb@ponts.org](mailto:hb@ponts.org)
- Isabelle Delin, employment and professional and geographical groups:  
Tel. +33 (0)1.44.58.24.18 - [isabelle.delin@ponts.org](mailto:isabelle.delin@ponts.org)





# PhD studies and research

## PhD Research Department

**Director: Bernard Lapeyre**

**Deputy director: Claude Tu**

Since September 2007 and the creation of the Université Paris-Est PRES (research and higher education cluster), École des Ponts ParisTech has delegated the management and award of doctoral degrees to this latter organisation. At the end of 2011, the total number of PhD researchers at Université Paris-Est stood at 1390, which included 306 doctoral students in laboratories where École des Ponts ParisTech is a stakeholder.

The Doctoral Research Department (DED) at Université Paris-Est is responsible for all the tasks associated with managing and supporting PhD students.

The School's laboratories are involved in 4 of the 6 Université Paris-Est doctoral schools:

- VTT: City, Transport and Territories
- SIE: Sciences, Engineering and Environment
- MSTIC: Mathematics and ICT
- OMI: Organisations, Markets, Institutions

### A top level doctoral programme

Recruitment is highly international: around half the students are from outside France.

The DED supports the research labs in establishing

formal research partnerships, in particular through jointly supervised or sponsored doctorates.

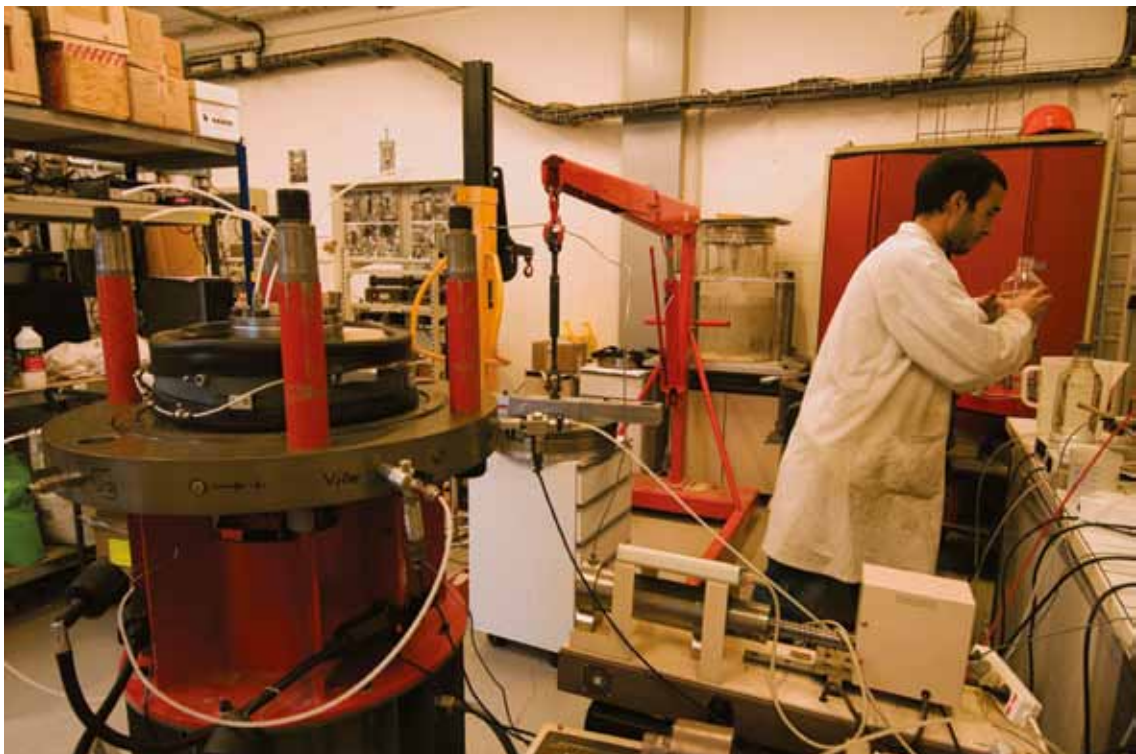
The DED helps future PhDs in their career development by:

- promoting the teaching of languages. PhD students who presented their theses in 2011 took an examination certifying their level of English (TOEIC – test of English for international communication);
- business initiation courses;
- personal help in career planning. The DED heads a branch of the Association Bernard Grégory (ABG) open to all PhD students at Cité Descartes.

A policy of inviting postdoctoral students, researchers and teachers as guest academics underpins the development of international exchanges. The DED selects recipients of “PhD research travel scholarships” designed to fund trips of around 2 months to foreign laboratories, and maintains a deliberate policy of inviting guest professors to deliver high-level courses on the site's doctoral programmes.

### PhD students 2012-2013

|                 |    |
|-----------------|----|
| New entrants    | 97 |
| 2nd year        | 82 |
| 3rd year        | 87 |
| extensions      | 56 |
| thesis defences | 74 |



Navier laboratory

## Research Department

Director: Serge Piperno

Deputy Director: Geneviève Jestin

90 researchers employed in 11 laboratories (in all housing slightly under 1000 researchers, postdocs and PhD students)

The objective of research is threefold:

- to progress in scientific knowledge, particularly in the different fields covered by the School in the training of its engineers, and to contribute to its dissemination through teaching, colloquiums, conferences and publications;
- to provide training through research for students seeking a position of responsibility in a company or public institution, or a career as a teacher and researcher;
- to transfer research results to the professional world through sustained involvement in research partnerships or consultancies, and also through life-long learning initiatives.

### Research topics

In the field of **materials and structures**, the School encompasses, within its Navier Laboratory, skills in mechanical engineering, geotechnics, in the physio-chemistry of materials and in the numerical and experimental simulation of materials and structures for engineering constructions, building and energy, in concert with industry. Laboratoire Navier, a mixed research unit (UMR) with CNRS and IFSTTAR, set up at the beginning of 2010, notably possesses an X-ray microtomograph, a medium-sized experimental instrument used to study the fine structure of materials, which lies at the heart of the laboratory's scientific activity. Other disciplines explore questions relating to materials and structures, such as applied mathematics at CERMICS (centre for teaching and research in mathematics and scientific calculus) which, amongst other things, tackle the microscopic aspects of the behaviour of materials (multiscale modelling and numerical simulation) or the eco-design of buildings or infrastructures, the automatic generation of digital models of buildings, in particular at the Gaspard-Monge Computer Science Laboratory (LIGM, a CNRS mixed research unit shared with UPEMLV and ESIEE,

which at the beginning of 2010 incorporated the activities of the former CERTIS). Other research, this time related to fluid mechanics, is carried out at the Saint-Venant Hydraulics Laboratory (in concert with EDF R&D and CETMEF), where structures are studied from the perspective of their interactions with flows.

In the field of **public policies, planning and transport**, the School favours a systemic vision of transport within the City-Mobility-Transport Laboratory (LVMT, a joint unit with IFSTTAR and UPEMLV), and at the Techniques-Territories-Societies Laboratory (LATTs, a joint CNRS Mixed Research Unit with UPEMLV), the School explores the question of cities, their networks and their territories, in all their complexity, encompassing the economic, physical, spatial, temporal and demographic aspects, and employing its threefold expertise in sociology, planning and engineering, while focusing on questions of management and risk forecasting.

In the environmental field, the School participates in the Dynamic Meteorology Laboratory (LMD, a joint CNRS unit shared with ENS-UPMC-École Polytechnique) which will soon become a partner. It is also involved in a range of activities relating to the atmospheric environment through CEREAs (centre for teaching and research on the atmospheric environment), a joint laboratory with EDF R&D, and relating to environmental (hydrological) and urban engineering questions at LEESU (water-environment-urban systems laboratory), a joint unit with UPEMLV, UPEC and AgroParisTech).

In the **economic and financial field**, the School is first a founding member of the Paris School of Economics and is a sponsor of the Paris-Jourdan UMR in Economics (jointly with CNRS, EHESS and École Normale Supérieure, as well as INRA). It is also active in questions involving not only engineering and sustainable development, but also the environment and development, in particular at the International Research Centre on the Environment and Development (a joint CNRS mixed research unit with AgroParisTech, EHESS) and maintains its long tradition of involvement in the field of mathematical tools for finance at CERMICS.

# The research laboratories: 2012 highlights



**CEREA**  
**Centre for Teaching  
and Research on  
the Atmospheric  
Environment**  
**Director:**  
**Christian Seigneur**

**Deputy Directors: Luc Musson-Genon  
and Marc Bocquet**  
<http://cerea.enpc.fr>

**Joint École des Ponts ParisTech - EDF R&D laboratory**  
**Permanent staff: 11**  
**PhD researchers: 24**  
**Postdocs: 12**  
**Engineers, administrative staff and technicians: 13**

**6-8 avenue Blaise-Pascal**  
**Cité Descartes – Champs-sur-Marne**  
**77455 Marne-la-Vallée cedex 2**  
**Tel: +33 (0)1 64 15 21 57**  
**Fax: +33 (0)1 64 15 21 70**  
**and**  
**EDF R&D**  
**6 quai Watier**  
**BP 49**  
**78401 Chatou cedex**

CEREA is a joint École des Ponts ParisTech-EDF R&D laboratory. It houses the CLIME project-team, a combined INRIA (National Institute for IT and Automation Research) and École des Ponts ParisTech team. CEREA is attached to Université Paris-Est's Science, Engineering and Environment (SIE) doctoral school. Its research activities focus on **air pollution and the micro-meteorology of the lower layers of the atmosphere**.

In 2011, CEREA joined Université Paris-Est's Universe Science Observatory, OSU EFLUVE, as a founding member and the "Urban Futures" Excellence Laboratory as a partner.

## Scientific partnerships

CEREA is involved in several ANR (national research agency) projects, and in the R2DS network for sustainable development in the Île-de-France Region. The partnerships with IRSN, INERIS, CETE Nord-Picardie and the Ministry of Ecology, Sustainable Development and Energy's scientific and technical network on air-related questions, are also very active.

In collaboration with Université Paris-Est Créteil's LISA, CEREA is conducting on behalf of ADEME (Environment and Energy Management Agency) an impact study on the **Grenelle de environnement "Plan Particules"** project on air quality in several large French cities.

Members of CEREA are actively involved in 2 initiatives under the European COST (Cooperation for Science and Technology) programme, relating to accidental emissions in built-up areas and air quality forecasting.

CEREA's air quality modelling platform, **Polyphemus**, is currently being used operationally by other bodies such as the Chilean weather service (Dirección Meteorológica de Chile) for forecasting air quality and CETE Nord-Picardie (centre for technical infrastructure research) for studies on the impact of road traffic on air quality. In addition, EDF's Code\_Saturne fluid mechanics model, the atmospheric version of which is developed at CEREA and which is available as freeware, is used for flow and thermal exchange studies by CEREA and other bodies such as CSTB (scientific and technical centre for construction), ENSA Nantes (higher national school of architecture), École Centrale de Nantes and INERIS.

CEREA carried out the first estimation of radioactive atmospheric emissions from **Fukushima Daiichi nuclear power station** through reverse modelling, using measurements of radionuclide concentrations available across the world and the Polyphemus/Polair3D atmospheric transmission model. Work is continuing to refine these results and estimate the associated uncertainties.

The CLIME project team has a partnership (I-Lab) with the SME Numtech. Through this CLIME/Numtech I-Lab, technologies developed at CEREA can be transferred for operational application in areas such as data assimilation, global forecasting and the handling of air quality uncertainties.

At SIRT (instrumental research site for remote atmospheric sensing), CEREA has set up a new experiment to study the atmospheric spread of pollutants in stable atmospheric conditions using propane. Several industrial firms and government bodies have expressed interest in taking part in these experiments with their instruments.

CEREA has been selected for two ANR projects, SAF-MED (headed by CEREA), which concerns the study of atmospheric pollution in the Mediterranean, and TRAFIPOLLU (headed by IFSTTAR), which is about the impact of car traffic on the urban environment. In addition, CEREA, in collaboration with LMD (dynamic meteorology laboratory), has been selected by the Ministry of Ecology for research into improving and harmonising the models used to forecast air quality.

Marc Bocquet, Deputy Director, jointly organised a summer school on advanced data assimilation for geosciences. It took place at the Les Houches Physics School from 28 May to 15 June, and was attended by 53 students and 25 teachers.

### Prizes, distinctions

**Florian Couvidat** received the 2012 Jean Bricart Prize from the French Association for Aerosol Study and Research (ASFERA), for his work on organic atmospheric aerosols.



**CERMICS**  
Centre for teaching and  
research in mathematics and  
scientific calculus  
Director:  
**Jean-François Delmas**

Deputy Director: **Alexandre Ern**  
<http://cermics.enpc.fr>

Permanent researchers: **16**  
Postdocs and PhD students: **40**  
Guest researchers: **6**

**6-8 avenue Blaise-Pascal**  
**Cité Descartes – Champs-sur-Marne**  
**77455 Marne-la-Vallée cedex 2**  
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**Fax: +33 (0)1 64 15 35 86**

CERMICS is an École des Ponts ParisTech laboratory which includes joint research teams with INRIA and Université Paris-Est Marne-la-Vallée (UPEMLV). CERMICS' scientific activity covers several fields of scientific calculus, applied probability, modelling and optimisation. In 2008, it received an A+ rating by AERES. Since 2011, CERMICS, the Université Paris-Est mathematics lab (LAMA) and IT lab (LIGM), have formed LabEx Bézout (models and algorithms: from discrete to continuous) under the Higher Education and Research Ministry's Future Investments Programme. Since 2012, these three laboratories have also formed the CNRS Bézout Federation.

In 2012, CERMICS, the chemistry and materials laboratory (ICMPE), the modelling and multiscale simulation laboratory (MSME) and Navier Laboratory formed LabEx MMCD (multiscale materials modelling and experimentation for sustainable construction) under the Higher Education and Research Ministry's future investments programme. The purpose of this LabEx (excellence laboratory) is to conduct innovative research on complex phenomena and materials with multiscale structures in civil engineering and the environment, drawing on cutting-edge skills in the fields of digital modelling, mechanics, physics and chemistry, as well as original experiments, notably in imaging.

The scientific subjects developed at CERMICS relate to: numerical methods in fluid mechanics and in fluid-structure interaction, molecular modelling and molecular and multiscale simulation (electronic structure calculations, numerical statistical physics, multiscale materials simulation), differential equations and their applications to materials and transport, optimisation and systems research (stochastic optimisation, system simulation, operational research) and

applied probability (modelling, numerical methods, financial mathematics).

CERMICS is involved in the "Molecular and multiscale simulations" project teams with INRIA and the "Mathrisk" project which replaced the "MathFi" project with UPEMLV and INRIA. It is also a participant in the Risk Foundation's "Financial Risks" Chair in partnership with Société Générale and École Polytechnique. This chair was extended in 2012 and is anticipating the entry of a new partner: UPMC (Université Pierre et Marie Curie).

### Partnership research activity

Industrial alliances are closely linked with research activities. A significant proportion of the results are achieved with research and development laboratories (ANDRA, BRGM, CEA, Creditnext, EADS, EDF, Société Générale, US Air Force, US Navy, etc.). CERMICS is involved in 7 programmes funded by the National Research Agency. The level of its contractual resources was very high in 2012, with some €640,000 for contracts signed by École des Ponts ParisTech.

Finally, CERMICS is heavily involved in teaching at École des Ponts ParisTech and at Université ParisTech and in several Parisian research Masters programmes.

### Publications and prizes

CERMICS maintained strong research activity with the publication of 3 books, more than 60 articles in peer-reviewed international journals and 5 book chapters. The year 2012 also saw the lab's participation in almost 140 lectures or seminars. A dozen lectures or workshops were organised by members of CERMICS. In addition, 3 thesis supervision licences were awarded, 9 theses were defended and 8 theses begun, notably through collaborations with industrial firms (EDF, CEA) or public research laboratories (IFSTTAR, UPMC, École Polytechnique).

Daniel Chemla (thesis presented in October 2012, supervised by Frédéric Meunier,) won the Young Researcher Prize 2012 from the French society for operational research and decision support (ROADEF).

### Arrivals, assignments, visits

- Francis Niers (PU) has been seconded by INRIA to the MicMac project team.
  - Mathias Rousset (CR INRIA, MicMac project team) joined CERMICS in September 2012. The subject of his research is computational physics (molecular simulation, fluid mechanics, micro/macro modelling), with an emphasis on the mathematical perspective and the use of probabilistic tools.
  - Laurent Monasse (IPEF, fluid dynamics team) joined CERMICS in September 2012. The focus of his scientific activities is the numerical study of the mechanics of fluids and solids and fluid-structure interaction.
- Several researchers have been invited to prestigious foreign universities:
- Tony Lelièvre was "Ordway visiting professor" at the University of Minnesota (academic year 2012-2013),
  - Claude Le Bris was invited to the university of Chicago (October to November 2012),
  - Régis Monneau was invited to Lebanon University (February to April, 2012),



- Eric Cancès was invited to the Chinese Academy of Sciences in Beijing (April 2012) and to IPAM UCLA in Los Angeles (October 2012).
- Alexandre Ern delivered the Von Neumann lecture at MathComp HGS (Heidelberg Graduate School of Mathematical and Computational Methods for the Sciences) in June 2012. He also gave the Year 1 Inaugural Class at École des Ponts ParisTech on “The storage of radioactive waste”.



**CIREDE**  
**International Environment and**  
**Development Research Centre**  
**Director: Franck Lecocq**  
<http://www.centre-cired.fr>

**Joint École des Ponts ParisTech**  
**- AgroParisTech - École des**

**Hautes Etudes en Sciences Sociales - CIRAD - CNRS**  
**mixed research unit 8568**

**Permanent staff: 36**

**PhD students and postdocs: 49**

**45 bis, avenue de la Belle-Gabrielle**

**94736 Nogent-sur-Marne cedex**

**Tel: +33 (0)1 43 94 73 73**

**Fax: +33 (0)1 43 94 73 70**

CIREDE is still shaped by the challenges that underpinned its foundation by Ignacy Sachs in 1971, to respond to the ideas of the Club de Rome on the limits of growth, by strategies to harmonise the environment and development, what we now call Sustainable Development. Originally involved in questions of energy/waste/transport/water/food, since 1988 CIREDE has focused on global environmental issues (ozone, acid rain, climate change) and the precautionary principle.

CIREDE is involved in numerous teaching programmes, in particular the EDDEE Masters programme (Economics of sustainable development, environment and energy) jointly accredited by AgroParisTech, École Polytechnique, École des Ponts ParisTech, MINES ParisTech, EHESS and Université Paris Ouest Nanterre La Défense. CIREDE is also associated with the ParisTech/Renault Foundation TRADD (Transport and sustainable development) Masters programme.

#### 2012 highlights

In keeping with its history of close links with international conferences on the environment (CIREDE was created following the first United Nations conference on the environment in Stockholm in 1972), the laboratory organised two events in Rio de Janeiro at the “Rio + 20” conference, including one study day, in order to draw lessons from the 40 years of negotiation on sustainable development issues.

CIREDE also organised, as part of the Chair in Forward Modelling for Sustainable Development, three “Belle Gabrielle Days”, focusing respectively on long-term energy/climate bioenergy scenarios (31 May), on economy-climate-carbon modelling for the next IPCC

report (4 July, in association with LSCE, ADEME and the CES SIG) and finally on the modelling of the city with reference to climate change (16 October, in connection with the ANR Vurca project).

In terms of staffing, 2012 saw the recruitment of two IPEF engineers (Vincent Viguié and Louis-Gaëtan Giraudet) and the departure of one PR engineer (Laurent Mermet, AgroParisTech). Tristan Le Cotty (CIRAD) took up an expatriate position in Burkina Faso as part of CIRAD’s priority focus on food security in West Africa.

The unit also received a new director, with Franck Lecocq (ICPEF, AgroParisTech) succeeding Jean-Charles Hourcade (DR CNRS, DE EHESS).

#### Organisation of national conferences:

- **EST (Energy Sociotechnics Territory) seminar**, “new energy collectives” session organised at CIREDE on 23 January. Paper by Mhairi Aitken from Edinburgh University: “Meaningful Community Engagement with Energy Projects: Challenges and Opportunities in the Scottish County”.

- **Belle Gabrielle/Forward Modelling Chair seminar**: “Economy-Climate-Carbon modelling” for the next IPCC report, 4 July 2012 (Christophe Cassen, Thierry Brunelle).

- **Day of the Chair**: 3 October 2012 “Forecasts for Energy-Climate issues” (Christophe Cassen).

- **“Modelling the city in relation to climate change**: Assessment of CO<sub>2</sub> emission reduction policies. Analysis of vulnerability to heatwaves (ANR VURCA project).” Organised with VURCA and the MPDD Forward Modelling Chair on 16 October;

- **Belle Gabrielle/Forward Modelling Chair seminar**: Issues of bioenergy in long-term energy/climate forecasting scenarios (Christophe Cassen”.

#### Distinctions awarded to PhD students:

**Louis-Gaëtan Giraudet** won the Paul Caseau Prize awarded by the Academy of Technologies and EDF for his thesis on “Economic instruments for energy management: a multidimensional evaluation” (CIREDE,



Franck Lecocq, new Director of CIREDE

supervised by Dominique Finon). This prize, awarded annually to three young researchers who have defended their PhD thesis in the previous year, is given for work that stands out for its scientific quality and the originality of the ideas or approach.

**Adrien Vogt-Schilb, Adrien and Stéphane Hallegatte** were awarded the second prize for the best student article by the French Association of Energy Economists (FAEE) for “When Starting with the Most Expensive Option Makes Sense on Marginal Abatement Cost Curves and Optimal Abatement Pathways”.

#### Headline publications:

- “Managing natural risks; Lessons from Storm Xynthia”, co-ordinated by Stéphane Hallegatte and Valentin Przyluski, researchers at CIRED, Editions Quae.
- “The green economy against the crisis: 30 proposals for a more sustainable France”, by Patricia Crifo, Matthieu Glachant, Stéphane Hallegatte (economist for Météo-France and at CIRED), Éloi Laurent, Gilbert Raphaël (Éditions PUF).

**LATTS**

LABORATOIRE TECHNIQUES  
TERRITOIRES ET SOCIÉTÉS

**LATTS**

Techniques,  
Territories and

#### Societies Laboratory

**Director: Olivier Coutard**

<http://www.latts.fr>

**Joint CNRS centre (UMR 8134)**

**Université Paris-Est (Université Paris-Est Marne-la-Vallée and École des Ponts ParisTech)**

**Permanent staff: 51**

**PhD researchers: 45**

**6-8 avenue Blaise-Pascal**

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A multidisciplinary centre for research, teaching and expertise in the social sciences, LATTS explores the technical and territorial rationales at work in organised action (public and private). In so doing, it seeks to foster dialogue between the social sciences and the world of engineers in both private and public sector organisations.

Two main empirical domains: territorial systems, urban networks and services, local public action, planning and risk, on the one hand; public and private organisations, work, sociotechnical innovation, organisational changes, on the other hand. This dual focus – a specificity of the laboratory – encourages the combination of multiple viewpoints: corporate territorial approaches, industrial approaches to urban services, organisational models in the public and private sectors, sociotechnical urban transitions, study of public action through the prism of its instruments or the work of public agents...

The laboratory is naturally very involved in classes at Paris-Est Marne-la-Vallée University (UPEMLV)

and ESIEE Paris. Its researchers at all levels are also involved in teaching programmes, both for engineering qualifications at École des Ponts ParisTech and for Masters degree courses (École des Ponts ParisTech and UPEMLV). LATTS also plays an important role in running the Masters programmes in Urbanism, Planning, Transport, in Company Sociology and Innovation and in Planning and Urban Commissioning.

At the same time, LATTS is heavily involved in heading research across eastern Paris: managing the École des Ponts ParisTech City Chair (partnerships with AFD, SUEZ ENVIRONNEMENT and GDF SUEZ); jointly managing the Paris Region’s Recherche, Innovation, Société Institute; contributing to Urban Futures & the SITES (Sciences, Innovations and Techniques in Society) excellence labs.

In 2012, LATTS underwent a significant demographic change: concomitantly with the departure of 2 teachers and researchers appointed to posts in other universities in Île de France (Nathalie Mons and Eric Dagiral), the laboratory welcomed 4 new researchers and teacher-researchers: 3 teacher-researchers from UPEMLV (Bilel Benbouzid, Soraya Boudia and Elsa Vivant) and one researcher from École des Ponts ParisTech (Vincent Spenlehauer), a new PAST (Dominique Cardon) and an UPEMLV colleague on secondment from CNRS (Nadia Arab). 2 UPEMLV colleagues (Benoît Lelong and Taoufik Souami) were also appointed university professors. 4 new postdocs (two of them funded by the Urban Futures and SITES LabEx) and 10 new PhD students also swelled the laboratory’s numbers.

#### Other high points of the laboratory’s life in 2012 include:

- the prizes awarded to 4 of its members (see below);
- the two-month stay by Simon Guy, professor at Manchester University, as UPE guest researcher;
- the inauguration on 7 February 2012 of the Ponts ParisTech City Chair (headed by Dominique Lorrain);
- the Metropolitan Governances colloquium jointly organised by LATTS (see below);
- the design of the new LATTS website, which went live at the beginning of 2013: [www.latts.fr](http://www.latts.fr)

#### Achievements (work completed and started in 2012)

Researchers at LATTS completed more than 40 research operations. Apart from a dozen research projects (including 2 ANR – national research agency – projects), these included the publication or editing of 7 scientific works and 7 themed journal features, the organisation or joint organisation of 7 colloquiums or seminars (4 of them international) and 2 scientific exhibitions, 2 research supervision accreditations and 6 thesis presentations.

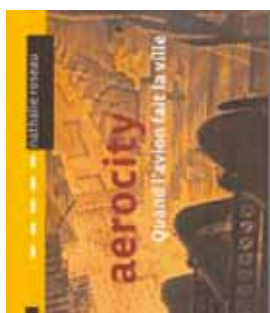
With regard to contractual activity beginning in 2012, we can cite: the launch of programmes under the École des Ponts ParisTech City Chair; the establishment of 5 new CIFRE agreements; the start of 3 European projects.

#### Major events (colloquiums/seminars):

- Colloquium: “Uses of energy in buildings. Thinking about transition” at ESIEE Paris (Hélène Subremon, post-doc at LATTS), 19 and 20 January,
- International seminar “From networked to post-networked urbanism: new infrastructure configurations and urban transitions” (Olivier Coutard, Jonathan Rutherford) in Autumn 17-20 July.
- Colloquium on “Governing the metropolises, authorities and territory, research evaluations and directions” Organised by LATTS (Christian Lefèvre and Nathalie Roseau), CEE (the Institute of Political Science’s European Studies Centre, Frédéric Gilli and Tommaso Vitale), and the City of Paris (Pierre Mansat, Metropolitan Paris and Interterritorial Corporations Department, APUR). Venues: Hôtel de Ville de Paris and Maison de la RATP, 28-30 November,
- Seminar on “Metropolises and energy in developing and emerging countries: governance of a new public urban issue”, organised by LATTS and EVS. SERVED (networked services in developing cities) seminar, supported by the French Development Agency and the City Chair (École des Ponts ParisTech, AFD, Suez Environnement, GDF-Suez), on 21 December.

#### Works published and edited:

- “De la ville nouvelle à la ville durable, Marne-la-Vallée”, by Clément Orillard and Antoine Picon, researcher (Éditions Parenthèses).
- “Aerocity: quand l’avion fait la ville”, by Nathalie Roseau, researcher at LATTS and head of the AMUR Masters programme (Éditions Parenthèses).
- “Faire le Grand Paris: avis des habitants consultés en 1859”, texts presented and edited by Nathalie Montel, researcher at LATTS (Presses Universitaires de Rennes).
- “Quelles métropoles en Europe ? Des villes en réseaux” by Ludovic Halbert, Patricia Cicille and



Céline Rozenblat (La Documentation française).

- “Les débordements de la mer d’Aral. Une sociologie de la guerre de eau” by Raphaël Jozan (PUF, Coll. Partage du savoir).
- “Struggling Giants: City-Region Governance in London, New York, Paris, and Tokyo” by Paul Kantor, Christian Lefevre, Asato Saito, H.V Sautch, Andy Thornley (University of Minnesota Press).
- “China Innovation Inc.” by Romain Bironneau; Rigas Arvanitis; François Bafoil; Bernard Kahane (Presses de Sciences Po).

#### Distinctions awarded to researchers:

Ludovic Halbert and Louise David won the prize

awarded by the Global Planning Education Association Network (GPEAN) for the best scientific articles identified by national urban planning associations for their article “World-Class Cities”: Hubs of Globalization and High Finance” (already awarded a prize in 2011 by the Association Pour Enseignement et la Recherche en Aménagement et Urbanisme). This article will be published in Volume 5 of *Dialogues in Urban and Regional Planning*.

Hélène Subremon won the AARHSE (academic association for energy-related historical and sociological research) University Prize for her book “*Anthropologie des usages de énergie. Un état des lieux*”, Paris, Éditions PUCA Recherche.

Vinciane Zabban won the 2012 Université Paris-Est Thesis Prize (Organisations, Markets, Institutions Doctoral School) for her thesis: “This is a world. The sharing of online games: design, techniques and practices”, presented in 2011 under the supervision of Patrice Flichy.



**LEESU**  
Water, Environment,  
Urban Systems

#### Laboratory

Director: Bruno Tassin

<http://leesu.univ-paris-est.fr>

UMR MA 102,

Permanent staff: 40 (including 2 research associates)

PhD students and postdocs: 44

École des Ponts ParisTech:

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and

Paris-East Créteil University

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and

Paris-East Marne-la-Vallée University

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and

AgroParisTech

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LEESU stands out for its multidisciplinary research, at the interface between hydrology, chemistry, ecology and political science, and for the important role of its collaborations both with academics and with institutional and industrial players.

It is thus a stakeholder in:

1. Université Paris-Est’s **Urban Futures Excellence Laboratory** which represents the culmination of a policy that has brought together world ranking research on the city and the urban environment;
2. the Universe Sciences Observatory - Fluid City Envelopes to Exobiology: **OSU-EFLUVE**,
3. the programme for long-term observation and experiment in research on the “urban environment”: **SOERE-URBIS**,

4. the programme for long-term observation and experiment for research on the “Alpine Great Lakes” environment: **SOERE-GLACPE**,
5. the **OPUR** Observatory, which it coordinates,
6. the **Hydrology for a Resilient City Chair** with Veolia Environnement

LEESU’s strength in recent years has lain in the structuring of its research activities. Its highlights are as follows:

#### Observation and analytical potential

In the sphere of the behaviour of natural environments:

1. Design of a **multiscale chain for the measurement of hydro-meteorological processes**, with facilities that came onstream in early 2013 and will continue in 2014, comprising in particular:
  - a 3-D disdrometer which records drop size in a m<sup>3</sup> volume of water by high-frequency photography,
  - an array of high-density 1-D disdrometers, in the urban environment (1 disdrometer every 100 m),
  - a dual-polarization X-band hydrometeorological radar system.
2. Continuing installation and implementation of a set of **physical and biogeochemical function sensors** for aquatic lake environments, comprising:
  - continuous, high-frequency measurement of meteorological parameters, thermal profile and chlorophyll profile,
  - a set of measurement sensors used to estimate turbulence and its consequences for phytoplankton and turbidity.

In the field of chemical contaminant sampling and analysis

- Strengthening of capacity to analyse organic micro-pollutants,
- Continuing development of passive sampling techniques using polymeric membranes.

As a result of these extensive investments, LEESU holds a significant national position in the small-scale observation of the urban water cycle, in the field of biogeochemical physical processes and their links. Its expertise is recognised in the analysis of several families of chemical contaminants, in both their dissolved and particulate phases

#### Scientific networks

The year 2012 was particularly marked by its participation in international scale work, in particular through its involvement in:

- the Knowledge and Innovation Community (KIC) Climate
- the European Academy of Wind Energy

At national level, 2012 saw the approval of the SOERE Urbis-urban environment label.

This networked structure, launched in 2008-2009, profoundly altered the laboratory’s positioning. In 2012, the new higher profile was reflected in the development of new partnerships and facilitated access to participation in large-scale projects.

#### Collaborative research

In recent years, there has been a change in methods of networking, which has resulted in:

- A change in the relations between institutions and scientists: with a shift in role from clients to agents, the institutional players are increasingly involved in the joint construction of research subjects;
- An assessment of transfers of knowledge between end users and scientists.

In 2012, the work undertaken towards of the process of introducing the Morins Water Planning and Management Scheme (SAGE) and the European INTERREG RAINGAIN project was illustrative of this new approach.

#### Modelling

Between hydrology and catchment area quality, modelling is an activity that is present right across the lab.

The mastery of the above-mentioned techniques of observation and analysis underpins the development of modelling, which is used to provide innovative representations of the operation of urban hydrosystems.

In 2012, the Multihydro, small-scale spatial flow rain transformation platform went into its pre-operational phase, and was adopted for the INTERREG RAINGAIN project.

In relation to the study of the impact of climate change on hydrosystem function, a first model was developed of the future of alkylphenols in the Seine River basin at timescales 2050 and 2100. The influence of climate change on pre-Alpine lake environments with high integration capacities, was assessed for the period 1976-1980 and estimated, on the basis of scenarios, for the period 2010-2060.

The interdisciplinary nature of these activities, the shifts of scale arising from the availability of spatially distributed and high-frequency observations contribute to making LEESU a major player in the national and international community in the modelling of the water cycle and human-influenced aquatic systems.

#### Distinctions awarded to researchers:

- **Daniel Schertzer** was elected chairman of the “Nonlinear Geophysics Focus Group” and to the Council of the American Geophysical Union.
- **Auguste Gires** received the “Outstanding Student Poster Award” in the Nonlinear Processes in Geosciences category of the 2012 EGU Conference (poster entitled “A toy model to deal with zero rainfall in a Universal Multifractal framework ”, jointly authored with D. Schertzer, I. Tchiguirinskaia and S. Lovejoy)
- **Mathilde Soyer** received the third JDHU – “Urban hydrology doctoral days” – prize

#### Publications :

LEESU publishes international journals that have an above-average SJR (SCImago Journal Ranking) impact factor in the main Environmental Science field (30 articles en 2012).





**LIGM**  
**Gaspard Monge**  
**Computer Science**  
**Laboratory - UMR**  
**8049**

**Director: Marie-Pierre Béal**  
**Deputy Director: Gilles Roussel then Jean-Christophe Pesquet**  
**Deputy Director responsible for relations with ENPC: Nikos Paragios**  
**Assistant Deputy Director responsible for relations with ENPC: Renaud Marlet**  
**<http://igm.univ-mlv.fr/LIGM>**  
**Researchers and teacher-researchers (including 3 emeritus and 37 accredited for research supervision): 71**  
**Other permanent staff: 10**  
**PhD students and postdocs: 71**

**LIGM - Université Paris-Est Marne-la-Vallée**  
**5, boulevard Descartes**  
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**IMAGINE**  
**IMAGINE (IMages Apprentissage et Géométrie pour la Numérisation d'Environnements – images learning and geometry for environment digitisation), a joint École des Ponts ParisTech and CSTB (scientific and technical centre for construction) project.**  
**IMAGINE/École des Ponts ParisTech staff are members of LIGM (UMR 8049).**  
**Director: Renaud Marlet**  
**<http://imagine.enpc.fr>**  
**Joint École des Ponts ParisTech - CNRS - Université Paris-Est Marne-la-Vallée - ESIEE Paris laboratory**  
**Permanent staff: 8**  
**PhD students and postdocs: 11**

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In late 2011, École des Ponts ParisTech and École Centrale Paris (ECP) joined forces in a research collaboration on questions of computer vision, statistical learning and optimisation. The name of this project is Center for Visual Computing. LIGM is associated with CERMICS and LAMA (analysis and applied mathematics laboratory), under CNRS, UPEC, UPEMLV, in Bézout LabEx, a laboratory working at the interface between mathematics and computer science on the theme of "Models and algorithms: from discrete to continuous".

**Key events**

- Nikos Komodakis, NPC researcher, joined IMAGINE in September 2012.
- Nabil Mustafa joined ESIEE Paris as a teacher-researcher, in January 2012.
- Gilles Roussel, previously deputy director of LIGM, was elected chairman of UPEMLV.
- Sylvain Lombardy (PR UPEMLV) transferred to LaBRI in Bordeaux.
- Nicolas Bedon (MCF UPEMLV) was promoted to a professorship in Rouen.
- Anthony Labarre was recruited by MCF UPEMLV in October 2012. He is a member of the bio-informatics group in the Algorithmics team.
- Philippe Biane became chairman of the National Committee of the new CNRS section 41 (Mathematics).
- Samuele Giraud was recruited to MCF UPEMLV in October 2012.
- Matthieu Constant was appointed a member (substitute) of the European action management committee COST IC 12007 PARSEME: PARSing and Multi-word Expressions. Towards linguistic precision and computational efficiency in natural language processing.
- Philippe Loubaton became an elected member of CNRS (Section 7) 2012-2016
- Jamal Najim, a CNRS researcher (CR1, HDR) was transferred to the Signal and Communications team on 15 October 2012 and became the team leader.

**Distinctions awarded to researchers and PhD students**

- The EADS Foundation's 2012 best thesis prize (interdisciplinary category) was awarded to Camille Couprie, thesis supervisors L. Najman and H. Talbot.
- The Gilles Kahn 2012 second thesis prize was awarded to Camille Couprie, thesis supervisors: L. Najman and H. Talbot.
- Nathalie Aubrun, PhD, was awarded Université Paris-Est's Thesis Prize 2012, for the MSTIC doctoral school.
- Valentin Féray, former PhD researcher under the supervision of Philippe BIANE and currently CNRS researcher at LabBRI, was the winner of the Collège de France's Cours Peccot (the course took place in January 2013).
- Matthieu Constant and Anthony Sigogne won the prize for the best conference article on automatic natural language processing (TALN'12).
- Philippe Loubaton became a senior member of the Institut Universitaire de France
- Jean-Christophe Pesquet became IEEE Fellow (the highest distinction awarded by the Institute of Electrical and Electronics Engineering)
- Florian Dupuy won the prize for the best thesis, prepared in collaboration with the Thalès Corporation (at international level)
- Emilie Chouzenoux won a "Best Paper Award" at the 2012 WHISPERS conference..



**LMD**  
**UMR 8539 - Dynamic Meteorology**  
**Laboratory**  
**Director: Vincent Cassé**  
<http://www.lmd.jussieu.fr>

**ENS - École Polytechnique - UPMC - CNRS mixed**  
**research unit (UMR)**

**Permanent staff: 102**

**PhD students and postdocs: 46**

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**and**

**École Polytechnique**

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**and**

**UPMC (Université Pierre et Marie Curie).**

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LMD studies planetary climate, pollution and atmosphere, combining theoretical approaches, the development of observation instruments and digital models. It is at the leading edge of research on dynamical and physical processes used in studying and forecasting the development of meteorological and climatic phenomena.

LMD's work centres around 2 major axes: the study of climate change and anthropic effects and the study of dynamical and physical processes in the Earth's fluid envelopes and surface.

The lab is a member of the IPSL (Pierre Simon Laplace Institute), a federation of six public environmental science research laboratories in Île-de-France. Within it, LMD played a lead role in several projects and focal areas, in climate modelling, in the Sirta observation site at the École Polytechnique, in planetology, in servers and databases.

#### **2012 highlights**

LMD saw the culmination of several years of development efforts, both on the technical front to build an innovative instrument to measure CO<sub>2</sub> flows, on the IT front to progress in digital atmospheric modelling, and on the organisational front to complete the first period of the HyMeX measurement campaign. The year 2012 was also an opportunity to celebrate 10 years of atmospheric measurement on the Sirta site and 25 years of radiometric work at the laboratory.

#### **- Cowi: a laser to monitor CO<sub>2</sub>**

In order to quantify the flows of CO<sub>2</sub> associated with exchanges between surface and atmosphere, LMD developed a lidar instrument for atmospheric monitoring above CO<sub>2</sub> storage sites. This lidar, christened Cowi (CO<sub>2</sub> & Wind lidar), combines measurements for the detection of aerosols and clouds, wind speed and CO<sub>2</sub> concentrations. The laboratory designed and produced a laser source with unique characteristics, using the latest advances in optical fibre technology, metrology and near-infrared spectroscopy.

**- Cmp5 for comparisons between climate simulations** The international Cmp (Coupled Model Intercomparison Project) project plays a major role in the study of climate change, by coordinating simulation activities and providing results used in the many studies and hundreds of publications that are subsequently be-incorporated into the IPCC reports. LMD contributed by providing a version of the LMDz atmospheric model for Institut Pierre Simon Laplace's (CNRS Research Federation) "Earth system model", coupling the "physical" part of the climate with chemical, aerosol and carbon cycle models. Major innovations have been introduced to represent the physical phenomena. The analysis of the results of the simulations is in its early stages, and has already led to more than 20 publications at IPSL.

#### **HyMeX campaign**

The HyMeX project brings together more than 400 scientists from some 20 countries from the fields of atmospheric sciences, oceanography, continental hydrology and the human and social sciences, along with operational players such as meteorology and hydrology services.

The aim of this multidisciplinary international programme, coordinated by LMD and CNRM (Météo-France), is to improve the understanding, modelling and forecasting of intense rain and floods, and droughts and heatwaves, in the Mediterranean region. The first intensive measurement campaign took place from 5/9/12 to 6/11/13. The range of devices included numerous ground instruments, buoys, aeroplanes and air balloons.

#### **10 years of measurements at Sirta**

The 10<sup>th</sup> edition of the Sirta (instrumental site for research by remote atmospheric sensing) science day attracted more than 120 participants from some 20 laboratories, organisations and institutes, for 65 presentations of work using Sirta data. It was an opportunity to recall that this Atmospheric Research Observatory was founded in 1999 at the initiative of IPSL and École Polytechnique for purposes of fundamental and applied research, and teaching. This IPSL service is the primary regional site representing atmospheric changes in Île-de-France. Over this ten-year period, infrastructure development has been considerable and the site has played host to numerous international measurement campaigns and developed a long-term observation programme in partnership with Météo-France.

#### **25 years of radiometrics**

The first data from the Franco-Indian satellite Megha-Tropiques, launched at the end of 2011, was the pretext to organise an event to celebrate the ScaRaB instrument. This instrument measures the visible and infrared radiation leaving the Earth in order to calculate our planet's energy balance. Three ScaRaB models built by the laboratory have gone into space on Russian missions, and now on Megha-Tropiques.

### Distinctions awarded to researchers and teachers

**Sandrine Bony**, CNRS Research Director and LMD researcher, received the Bernard Haurwitz Memorial Lecturer Prize from the American Meteorological Society (AMS).

**Olivier Talagrand**, CNRS Research Director emeritus, was appointed an Honorary Fellow of the Royal Meteorological Society in 2012.

**Hector Teitelbaum** received the "RAICES" Prize from the Argentinian government, awarded to Argentinians abroad who have promoted links with the country and fortified its scientific and technological capacities.

**Denis-Dider Rousseau**, CNRS Research Director, was elected to the executive committee of the international scientific steering committee of PAGES 2012.



**LVMT**  
**UMR T 9403 - City, Mobility, Transport Laboratory**  
**Director: Jean Laterrasse**  
<http://www.lvmt.fr>

**Joint École des Ponts ParisTech - UPEMLV - IFSTTAR laboratory (UMRT 9403)**

**Permanent staff: 29**

**PhD students and postdocs: 31**

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LVMT's 3 teams analyse and model, from a sustainable development perspective, the mechanisms at work in the interactions between mobility practices, transport infrastructures, land use and spatial planning. LVMT's research is divided into "structuring" threads:

- **Sociology and anthropology of ways of life and mobilities:** the mobilities of metropolitan residents are analysed through the choices, capacities, competences, perceptions and representations employed by households and economic actors in travelling and moving around metropolitan space. **Completed contracts:** "periurban areas, between car dependency and socio-spatial segregation (PUCA); "the city at home: mobilities and services" (City on the Move Institute); SAVE "Electric Vehicle Experiment in Seine Aval" (EDF and Renault) **PhD researchers:** J. Chrétien, C. Noble, C. Pinto, J. Devaux, F. Valéguas.

- **Urban dynamics and location strategies:** the aim is to understand how the location strategies of households and companies interact with transport systems

and the mobility of individuals at different spatial scales. Socio-spatial segregation and inequalities of access are among the questions tackled. **Completed contracts:** TADEL "relations between accessibility and local economic development" with INRS Montréal (ANR and Région Île-de-France); Remus 2 (PREDIT) and OREVADD (MEDDE, Epamarne) on urban forms, mobilities and sustainability. **PhD researchers:** A. Byrd, B. Conti, M. Garreton, J.-F. Ruault.

- **The making of mobility policies: juggling scales, connecting sectors:** the challenges of "sustainable mobility" make the issue of changes in public action crucial. LVMT is therefore exploring the way in which the actors at regional and local level tackle problems relating to the connection between transport policy and planning policy, and implement appropriate action strategies. **Completed contract:** "Public action, Intermodality and Sustainable Mobility" (PREDIT 4). **PhD researchers:** F. Adoue, A. Audikana, E. Riot

- **Transit-oriented development and 21st-century stations:** methods and analytical tools designed by LVMT examine forms of organisation of public transport (intermodal connections, spatial organisation...) that are compatible with more sustainable spatial development at different scales (district, region,...). This theme links up with the international issue of Transit Oriented Development, with a particular focus on rail. Partnerships: GRETTIA (IFSTTAR) and TU Munich. **Completed contract:** CLOSER: Connecting Long and Short Distance Transport (EU contract). **PhD researchers:** M. El Hadeuf, E. Libourel, L. Liu, F. Lo Feudo, R. Zelezny. **Postdoc:** L. Tomasoni.

- **DUO model of urban and regional passenger transport:** transport is a key factor in the attractiveness of cities and requires a new kind of planning, involving all modes: road and rail, individual and collective, green and motorised. For this purpose, the services offered, the potential demand for them and their actual use in an area, are finely modelled. Hence the acronym DUO, for Demand-Use-Offer/supply. **Partnerships:** Stif & Vinci Chairs and Regienov contract (Renault S.A.) **PhD students:** V. Benezech, H. Boujnah, V. Boutueil, E. Chandakas, M. Samazdad, E. Windisch.

- **Economics and systems of territorial and transport planning :** this inherently multidisciplinary project seeks to capitalise on and develop knowledge in operational (applicable) form, in simulation models and assessment methodologies. **Completed contract:** Aspect 2050: systemic approach to territorial climate and energy plans (ANR Sustainable City). [www.aspect2050.fr](http://www.aspect2050.fr) **Partnerships:** Stif and Vinci Chairs. **PhD student:** V. Lasserre-Bigorry.

- **Transport networks, traffic and impacts - modelling, measurement and management:** the objective of this multiannual project is threefold: to add to the array of travel observation tools (e.g. household surveys) by exploiting their digital tracks (e.g. ticketing, mobile telephony); to improve the models developed at LVMT: Ladta (dynamic road traffic allocation) and

choice models (itineraries and departure times); to design and assess innovative services or operating methods (e.g. bus rapid transit). **PhD researchers:** S. Millan Lopez, C. Million, M. Ben Khémis

- **Tourism and the face-to-face economy:** this initiative, developed in connection with Marne-la-Vallée Tourism Cluster, analyses the dynamics and transitions that currently affect tourist systems, the transport networks supporting them, their integration into metropolitan areas and their links with spatial planning, development and sustainability. **Partnerships:** DEST (IFSTTAR) and Lab'Urba (UPEC). **PhD researchers:** C. Colin, E. Libourel and J. Perrin
- **Design and evaluation of mobility systems: LVMT conducts scientific monitoring of innovations in transport systems and services:** (e.g. on-demand transport, carpooling, car-sharing). It tracks experiments on electric vehicles and analyses the factors that contribute to the successes or failures of new mobility systems. Completed contracts: SALOME and ETUVE (Renault SA), SAVE (EDF and Renault SA) Partnership: IEED VeDeCoM 2 (PSA, Renault, Saint-Quentin en Yvelines area). **PhD researchers:** V. Boutueil, S. Sadeghian, E. Windisch
- **Social and spatial data and urban modelling:** the goal of this project is to improve urban modelling using a quantitative geography approach. In the long run, technical solutions for referencing, storing and providing access to data will be available to the Futurs Urbains LabEx and its partners. **Partnerships:** belgrand-geb. ifsttar.fr website, SPLOTT, GRETTIA and DEST (IFSTTAR labs); MEDDE's DRI "GEBD Network", IGN (COGIT and ENSG) and IRSTV. **PhD researcher:** J. Baro.

#### 2012 events:

##### Prizes and distinctions

- **Double thesis prize** Nicolas Oppenchain was awarded **2 thesis prizes:** École des Ponts Paris Tech best thesis and Université Paris-Est best thesis (City, Transport, Territory doctoral school).
- **Academic Palms:** **Nathalie Fabry**, senior lecturer at UPEMLV and **Jean Laterrasse**, Professor at UPEMLV, both HDR researchers, were given the rank of Knight of the Order of Academic Palms.
- **Ander Audikana** (PhD awarded 2012) obtained a **Fulbright-Schuman scholarship for a postdoctoral stay** at University George Mason (Department of Public Policy) to do research on high-speed rail projects.

##### Publications, doctoral theses

- 38 WoS articles and 49 published conference papers.
- 5 scientific works edited, 5 works published [including: Korsu E., Massot M.-H., Orfeuill J.-P., 2012, La ville cohérente. Penser autrement la proximité, Paris, La Documentation Française, 120p (**PREDIT Group 3** research prize in 2011)] and 22 chapters in published works.
- 2 doctoral theses presented: **Nicolas Wagner:** "Mathematical properties and economic applications:

the dynamic equilibrium of road traffic" (Supervisor: Fabien Leurent); **Ander Audikana:** "The politicisation of high speed in Spain (1986-2011): construction of a myth, production of a consensus, emergence of a controversy" (supervisors: A. Faure and Ollivier Trigalo).

##### LVMT, main organiser of 3 international colloquiums with published proceedings

- April: 1st **BUFTOD** "Building the Urban Future and Transit Oriented Development colloquium: rail and other modes, connecting with urban and regional development". 50 papers and 20 countries represented. [www.lvmt.fr/buftod2012](http://www.lvmt.fr/buftod2012);
- September: **XVth EWGT European colloquium.** 150 papers on the topic of "Energy Efficient transportation networks". The proceedings were published by Elsevier – Procedia Social and Behavioural Sciences. [www.lvmt.fr/ewgt2012](http://www.lvmt.fr/ewgt2012),
- December 2012: International colloquium on "**20 years of Economic and Social Transformations at Val d'Europe**". Publication due in 2014 (provisional title: "Tourismes, loisirs and territoires. La transformation du territoire par le tourisme and les loisirs", éditions œil d'Or, Paris).

##### Academic chairs and special national loan: dynamic partnerships

LVMT is the coordinator of École des Ponts ParisTech's scientific activities within the framework of 3 academic chairs: Vinci, Stif and SNCF Gares & Connexions.

In 2012, the work conducted through these chairs was publicised on three separate days:

- 29 March at the School: lecture for the 2nd anniversary of the **Stif Chair** "Socio-Economics and Modelling of Public Urban Passenger Transport",
- 11 May: **signature of the Chair with SNCF Gares & Connexions** "Reinventing stations in the 21st century: Design, planning, regulation and management of railway stations and intermodal hubs".
- 8 November at the School: 4th **Vinci Chair** anniversary day "Eco-design of buildings and infrastructures" dedicated to district eco-design methods.
- LVMT is actively involved in forward-looking projects to do with new mobility services and the electric vehicle: participation in Efficacy and IEED VeDeCom (section 3) and launch in 2012 of the SYSMO project, SAMI software (simulation of transport supply and use from telephone data), a special national loan project financed by ADEME

##### Teaching: 2 new engineering degree courses

LVMT's teacher-researchers share all the advances in knowledge acquired during their research with students at Masters level and above. Two new engineering degree courses were created in 2012 at the School: Analysis and design of transport systems and Econometrics of discrete choices.





**NAVIER Laboratory**  
**UMR 8205**  
**Director: Karam Sab**  
<http://navier.enpc.fr>

**Joint École des Ponts ParisTech - IFSTTAR – CNRS laboratory**

**Permanent staff: 86**

**PhD students and postdocs: 110**

**6 et 8 avenue Blaise-Pascal**  
**Cité Descartes - Champs-sur-Marne**  
**77455 Marne-la-Vallée cedex 2**  
**Tel: +33 (0)1 64 15 37 37**

**2 allée Kepler**  
**77420 Champs-sur-Marne**  
**Tel: +33 (0)1 81 66 84 77**

**IFSTTAR**  
**14/20, boulevard Newton**  
**Cité Descartes-Champs-sur-Marne**

Founded in 2007 by the late Olivier Coussy, on 1 January 2010 Laboratoire Navier became a mixed research unit of École des Ponts ParisTech, IFSTTAR and CNRS (UMR 8205). The laboratory staff is spread across 2 sites adjacent to Cité Descartes: about a third of them in a building rented by IFSTTAR on Allée Kepler (Kepler site), and around two thirds in the main ENPC site on avenue Blaise-Pascal (Pascal site). The laboratory also has an MRI device which is located in the Université Paris-Est Marne-la-Vallée (UPEMLV) buildings at the French Institute of Urbanism (IFU). Plans are currently underway to move the whole staff into the Pascal site.

The laboratory has a permanent staff of 86, made up of 58 researchers, 20 engineers/technicians and 9 administrative personnel, as well as 91 PhD researchers in 2011-2012 and 19 postdocs

Since 1 January 2012, Laboratoire Navier has been structured into 6 research teams:

- Dynamics (Dynamique), Denis Duhamel.
- Geotechnics (CERMES), Jean Sulem.
- Architected Materials and Structures (MSA), Jean-François Caron.
- Multiscale modelling and experiment for heterogeneous solids (Multi-échelle), Michel Bornert.
- Physics of porous media (Poreux), Philippe Coussot.
- Rheophysics (Rhéophysique), Xavier Chateau.

Laboratoire Navier conducts research in the mechanics and physics of materials, structures and geo-materials. Its research relates to civil engineering, the environment and sustainable development, energy and transport. The applications are relevant in particular to eco-design, the sustainability and engineering of materials and structures, geotechnics, geological storage (radioactive waste, CO<sub>2</sub> gas), petroleum engineering and noise abatement. These specialties attract substantial contracts with public

institutions (Andra, BRGM, CETU, CSTB, IFP, Ifremer, INERIS, SNCF...) and private companies (ALSTOM, Arcelor, Lafarge, Saint-Gobain, Schlumberger, Total, Véolia,...), within the framework of European or French projects. The research approaches are theoretical and numerical (scale change methods, discrete simulations, finite element methods, etc.) as well as experimental, notably entailing the use of large imaging devices (Magnetic Resonance Imaging, X-ray Microtomography) in geotechnics (Single Ring Shear Apparatus, Calibration Chamber) and of demonstrators (bridge made of composite materials, grid-shells, mixed concrete and wood structures, etc.).

Laboratoire Navier undertakes extensive teaching activity in mechanics, physics and geotechnics, for engineering degrees at École des Ponts ParisTech and École polytechnique, and in research Masters programmes. It is a participant in several teaching and research Chairs (EDF, Bouygues, Vinci, Saint-Gobain, Lafarge, CO<sub>2</sub>,...). It coordinates several IFSTTAR research operations "Modelling of the manufacture of granular civil engineering materials", "Geological storage of CO<sub>2</sub>" and "Biosourced and natural materials for sustainable construction". It also heads several national research agency (ANR) projects: MicroNaSel (M. Bornert), Suspaseuil (G. Ovarlez), Geotechnical aspects of foundation piles in energy-related buildings (A-M. Tang)...

In 2012, along with its Université Paris-Est partners, Laboratoire Navier reaped the benefits of Future Investment Projects through the acquisition of the "Multiscale Materials Modelling and Experimentation for Sustainable Development" Excellence Laboratory headed by Philippe Coussot.

#### **Achievements**

**The canopies in Green Corner**, the Well-Being zone at the **Solidays Festival**: École des Ponts ParisTech, Laboratoire Navier and the Solidarité Sida (AIDS Association) joined forces again in 2012 for a further adventure, following the success of the partnership to build a gridshell at the Solidays Festival in June 2011.

**Temporary Cathedral of Créteil**. Laboratoire NAVIER's MSA team took part in the design and construction of the temporary cathedral of Créteil, a project designed by the T.E.S.S. bureau for Créteil Diocese.

#### **Distinctions awarded to researchers, teachers and PhD students:**

**Laurent BROCHARD**, former PhD student at École des Ponts ParisTech's Laboratoire Navier (supervised first by Olivier Coussy then by Teddy Fen-Chong and Roland Pellenq, Marseille University, and supported by Matthieu Vandamme) received the prize from the **French Carbon Study Group (GFEC)** for his doctoral research at the School in October 2011. His thesis, with the title "Poromechanics and absorption: application to the swelling of coal during geological carbon storage", showed why microporous carbons become deformed in the presence of methane and carbon dioxide, and therefore made it possible to predict the

behaviour of coal seams in geological carbon storage applications.

**Sébastien Brisard** received the **Fondation des Ponts** thesis prize for his work on “Morphological analysis and numerical modernisation - Application to cement paste”. This thesis was prepared at Laboratoire Navier, under the supervision of professors Dormieux (Navier, Multi-échelle) and Levitz (UPMC, PECSA).

**Arthur Lebée**, a researcher in the MSA (Architected Materials and Structures) team at Laboratoire Navier, received the **Daniel Valentin Prize 2012** for his work on composite materials. The prize is awarded for a structured set of work carried out over a limited number of years, though possibly taking multiple forms: professional experience, doctorate, research work, pedagogical improvements, etc.

**Mohammad Monfared** (sub.: Jean Sulem, Pierre Delage) received the European **ALERT (Alliance of Laboratories in Europe for Research and Technology) Geomaterials Thesis Prize** for his work on “Temperature-Damage-Permeability pairings in soils and clayey rocks”.

**Nicolas Peyret** was awarded equal first **AFM GST Vibrations and Noise Prize for the best paper**, jointly authored with Jean-Luc Dion, Gaël Chevallier and Pierre Argoul. He produced his thesis on “Dissipation of mechanical energy in assemblies: friction effect under dynamic demand” within Laboratoire Navier’s Dynamics team (supervisor: Pierre Argoul), defending his thesis at École des Ponts Paris Tech on 18 October.

#### Other highlights;

- 17 theses presented;
- More than 120 WoS articles;
- Acquisition of an environmental nano-indenter.
- Organisation of the **international workshop** “Flocculated suspensions: from microstructure to macroscopic behavior” at École des Ponts ParisTech. The event was held under the aegis of the Chair in “Materials Science for Sustainable Construction”.
- **W(H)YDOC 12: 4th International workshop of young geomechanics researchers from 21 to 23 November at the Cauchy amphitheatre:**

This event was coordinated by Laboratoire Navier. Some twenty PhD students with theses near completion were invited from prestigious international universities (Belgium, Brazil, China, Spain, France, Great Britain, Netherlands, Italy, Czech Republic, Poland, Sweden, Switzerland, USA) in order to present and discuss their work in the presence of high-level academic experts (from Brazil, France, Hong Kong, Switzerland, Sweden). These experts also gave lectures. The PhD research presentations were entered in a competition, with a W(H)YDOC prize being awarded to the best scientific presentation. A printed version of the papers was also published.

#### - Publications :

- “Matter in every kind of state”, by Philippe Coussot, head of the “porous” team, (EDP Sciences).
- “Statistical physics for engineers”, by François Chevoir, Deputy Director of Laboratoire Navier and head of the School’s course in statistical physics (Editions Presses des Ponts)



**SAINT-VENANT  
LABORATORY  
SAINT-VENANT  
HYDRAULICS  
LABORATORY**

**Director: Michel Benoit**

<http://www.saint-venant-lab.fr/>

**Joint École des Ponts ParisTech - EDF R&D – CETMEF  
(Centre d’Études Techniques Maritimes and Fluviales)  
research laboratory**

**Permanent staff: 25**

**PhD students and postdocs: 12**

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**BP 49**

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**Fax: +33 (0)1 30 87 80 86**

The laboratory conducts research in the field of fluid mechanics applied to water systems and the environment. It covers fields such as free-surface hydraulics in fluvial environments (lakes and reservoirs, rivers, navigable waterways, etc.), maritime and coastal areas (estuaries, coastal zones, continental seas and oceans), and ports. Its research is structured around 4 physical areas:

- Waves and maritime and coastal hazards (leader: Michel Benoit)
- Dynamics of flows and transport (leader: Nicole Goutal)
- Flow/structure interactions for engineering structures and developments (leader: Damien Violeau)
- Sedimentary dynamics in rivers, estuaries and coastal zones (leader: Damien Pham Van Bang)

#### Staff:

In 2012, there was little change in the number of permanent researchers in the laboratory. Giovanni Mattarolo (PhD, EDF engineer and researcher) left the lab on 31 December to take charge of a project at EDF R&D. Olivier Boucher, a CETMEF experimental technician, was transferred to CETMEF’s Brest centre (LGCE – Coastal Engineering and Environment Laboratory); he nevertheless remains involved in the laboratory in a number of ongoing experimental projects.

Two postdoctoral researchers finished their work at the laboratory: **Yoann Le Bars** (“Modelling of tides and sealevel rises and falls on the Atlantic coast and

application to the study of the current and future climatology of sealevel rises”) and **Martin Parisot** (“Lateral coupling between the 1D - 2D Saint-Venant equations for floodplain modelling”). Three other postdoctoral researchers began their work: **Nicolas Claude** (“Morphodynamic modelling in the Loire around the Chinon powerstation’s inflow and outflow structures”), **Jeffrey Harris** (“Potential non-linear 3D modelling of immersed wave energy converter systems”) and **Alexander Vorobyev** (“Development of a GPU version of the 3-D Smoothed Particle Hydrodynamics method”).

Three PhD students at the laboratory defended their theses at Université Paris-Est (doctoral School of Sciences, Environment Engineering): **Cédric Goeury** (“Modelling of the transport of hydrocarbon layers in continental and estuary zones”, supervisor: Jean-Michel Hervouet), **Lan Anh Van** (“Modelling of the transport of mixed sand-silt sediment and application to the morphodynamics of the Gironde Estuary”, supervisor: Catherine Villaret, joint supervisor: Damien Pham Van Bang), **Andrés Die Moran** (“Physical and numerical modelling: investigation of induced bank erosion as a sediment transport restoration strategy for trained rivers. The case of the Old Rhine (France)”, thesis supervisor: Catherine Villaret, joint supervisor: Kamal El Kadi Abderrezzak).

Four new theses were begun at the laboratory: **Emmanuel Dombre** (“Hydrodynamic modelling of offshore wind turbine floats subject to real sea conditions”, CIFRE thesis with EDF), **François Charrayre** (“Modelling of wave energy converter farms: effects of interactions between farm scale systems and impact on the regional scale wave climate”, thesis funded by the National Research Agency’s MONACOREV project), **Annalena Goll** (“3-D digital modelling of the formation and dynamics of dunes in watercourses”, thesis funded by the Bundesanstalt für Wasserbau, Karlsruhe (Germany), and **Shafiqul Islam** (“Modelling of diphasic turbulence for sedimentary transport”, thesis half funded by École des Ponts ParisTech and half by CETMEF).

Finally, 5 interns, Masters students or engineering students (including two from École des Ponts ParisTech), were admitted to the laboratory.

#### Key elements of scientific production:

Journal publications remained at a high level in 2012, with a total of 13 articles published, 11 of them in A ranked journals, with impact factors in excess of 0.8. Of these articles, 5 were published in high-level journals: Journal of Physical Oceanography, Advances in Water Resources, Physics of Fluids, Ocean Modelling and Computer Methods in Applied Mechanics and Engineering.

A book on the SPH (Smoothed Particle Hydrodynamics) method applied to fluid mechanics, by Damien Violeau, EDF R&D researcher/expert at the Laboratory, was published by Oxford University Press. This very

comprehensive book (616 pages) is set to become a textbook on this particular method, which is particularly suitable for the simulation of complex flows.

#### Organisation of national and international scientific events:

- the **13<sup>th</sup> Hydrodynamics Days** which took place in Chatou from 21 to 23 November. Every two years, this conference brings together French-speaking hydrodynamics researchers working around the following fundamental topics: naval hydrodynamics, fluid-structure couplings, wave power and tidal power, using theoretical, numerical and experimental tools. Around 120 people took part in this event, which is an excellent opportunity to prompt interchanges between specialists in the fields concerned, and to present advances from the most recent research. The organisers of this event at the Laboratory were M. Benoit, C. Buvat, C. Kassiotis, C. Peyrard, with support from M. Dramé and J. Chieze on the logistical and administrative aspects.

- an international workshop on **Uncertainty Modelling in Hydraulics, UMH 2012** in Stresa (Italy) on 28 and 29 June 2012, organised in close collaboration with Politecnico di Milano (Italy). The people at the Laboratory involved in organising and managing this event were N. Goutal, P. Bernardara, S. Boyaval and R. Ata.

- an annual seminar by the specialist group in **“Hydrodynamics and Ocean Weather”** from CLAROM (research initiatives on sea-based structures), jointly headed by Michel Benoit and Bernard Molin (École Centrale Marseille) was organised to coincide with the 13th Hydrodynamics Days on 21 November in Chatou, which encourage discussions between academic and industrial circles.

- an annual meeting of the **Mascaret Users Club**, attended by 35 people, took place on 20 June on the Chatou site and was organised by Nicole Goutal.

#### Teaching:

The Lab’s researchers are heavily involved in teaching at École des Ponts ParisTech:

- Year 2 course on the “Mechanics of incompressible fluids” (100 students):

Michel Benoit is a professor at École des Ponts ParisTech and heads the course.

Damien Violeau is a lecturer at École des Ponts ParisTech, and leads the small class sessions.

- Year 2 course in “Maritime Engineering” (35 students):

Michel Benoit is a professor at École des Ponts ParisTech and heads the course. Elodie Gagnaire-Renou and Pablo Tassi also teach this module.

- Year 1 course in “Scientific Calculus”:

Sébastien Boyaval teacher the small class sessions,

- Year 1 course in "Analysis":

Christophe Kassiotis taught as a replacement in the small class sessions.

- Year 1 course in "IT: Algorithmics and Programming":

Christophe Kassiotis taught as a substitute in the small class sessions.

The Laboratory was actively involved in organising the 2012 series of "LHNE – Labo Saint-Venant" courses on free surface hydraulics. This course, aimed at staff of the laboratory and of different EDF units, but also open to outside participants, attracted some 30 attendees during the 12 half-day courses spread over May and June. This class extensively involves researchers at the Laboratory: D. Violeau (general organisation), N. Goutal, J-M. Hervouet, E. Gagnaire-Renou, P. Tassi, C. Villaret, M. Benoit.

Finally, several researchers are involved in Masters degree classes in different universities, as well as in the lifelong learning courses provided by Ponts Formation Conseil. Particularly noteworthy is "Sea conditions as input data for setting dyke dimensions" by Michel Benoit in the Ponts Formation Conseil (PFC) course on: "Dykes in harbour sites: design and construction".



**PSE  
PARIS-JOURDAN  
ECONOMICS  
LABORATORY  
PARIS SCHOOL OF  
ECONOMICS**

**Director: Pierre-Yves Geoffard**

**Deputy Directors: Jérôme  
Bourdieu, Romain Rancière**

**<http://www.pse.ens.fr>**

**CNRS UMR 8545 (CNRS - École  
des Hautes Études en Sciences**

**Sociales – École des Ponts ParisTech – École normale  
supérieure - INRA)**

**Permanent staff: 76**

**PhD students and postdocs: 96**

**PSE**

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**Fax: +33 (0)1 43 13 63 00**

PPSE is a central component in the establishment of a Parisian centre of excellence in economics, with international visibility, incorporating activities of academic research, both theoretical and applied, implementation and teaching at Masters and doctoral level.

PSE is supported by the École d'Économie de Paris - Paris School of Economics (EEP-PSE). EEP-PSE is a scientific cooperation foundation set up on 21 December 2006

as part of the Framework Act on research. A thematic advanced research network (RTRA), it also incorporates part of the Sorbonne Economics Centre (CES-UMR8174) with the Theoretical and Empirical Economics (ETE) programme.

PSE covers almost all aspects of modern economics and ideas on contemporary economic problems. They are based on a single methodological approach, founded in theoretical modelling and econometric confirmation. This research is structured into 6 fields:

- theoretical economics;
- markets, risks and organisations;
- public economics and the labour market;
- macroeconomics;
- development, economic geography and international integration;
- economic history.

The year 2012 was marked by the presence of 34 guest researchers from all over the world and the presentation of 16 doctoral theses. The research activity also "feeds into" the teaching (degree, Masters, positions in universities...). The laboratory was associated with a large number of international and national conferences, as well as a multitude of editorial activities and articles in peer-reviewed journals, participation in networks, learned societies and scientific programming communities... Following an architecture competition, an architectural team was appointed to construct a new building, which will be delivered in 2015 and will bring all the researchers at the Paris School of Economics together on the Jourdan site.

#### Highlights:

#### Creation of the Institute of Public Policy (IPP):

**[www.ipp.eu](http://www.ipp.eu)**

PSE-École d'économie de Paris and the Centre for Economic and Statistical Research (CREST) joined forces to develop the Institute of Public Policy (IPP). Created in September 2011 as part of the OSE (Open Economic Science) Excellence Laboratory led by PSE, the goal of IPP is to promote the quantitative analysis and evaluation of public policies.

Its official presentation, together with the results of its first study on "Tax policy and redistribution in France: 1997-2012" took place on 2 April. IPP consists of a permanent team and some 40 affiliated researchers, mainly from CREST and PSE.

#### IPP notes

All the work of IPP is intended for publication and the Institute attributes great importance to the dissemination of the results of its research outside academic circles. For this reason, alongside traditional (and sometimes technical) academic publications, IPP provides access to a large number of more accessible documents, including the IPP notes in a concise format (4 pages). The following were published in 2012:

- "La défiscalisation des heures supplémentaires: les enseignements de l'expérience française" [The removal of tax on overtime: lessons from the French experiment] by Pierre Cahuc and Stéphane Carcillo



- "Budget 2013: la réforme de impôt sur le revenu" [2013 budget: the income tax reform] by Antoine Bozio, Brice Fabre, Jonathan Goupille and Quentin Lafféter.

#### Launch of G-MonD Notes

A group of researchers from PSE-École d'économie de Paris, G-MonD exists primarily to lead and develop ideas on the economic analysis of globalisation and development. Research in the different fields covered forms the basis of a series of published working documents, including a collection of notes

#### Lecture

PSE-École d'économie de Paris, Flammarion and Cepremap (Centre for Economic Research and its Applications) organised a lecture on 26 October by **Daniel Kahneman, winner of the 2002 Nobel Prize for Economics**, to coincide with the publication in France of his latest book "Système 1, Système 2: les deux vitesses de la pensée" [English title: "Thinking, Fast and Slow"]. A specialist in cognitive psychology and experimental economics, Daniel Kahneman is professor emeritus at Princeton University.

#### Awards, distinctions:

**Hippolyte d'Albis**, associate member of PSE-École d'Économie de Paris and professor at Université Paris 1 Panthéon-Sorbonne, member of the Institut Universitaire de France, won the 2012 prize for the best young economist.

**François Bourguignon** won the American Economic Review's Best Referee Prize.

**Frédéric Koessler** won the 2012 Prix Malinvaud from the French Association of Economics for his article, jointly published with Jeanne Hagenbach, in the Review of Economic Studies "Strategic Communication Networks" 2010, 77 (3), 1072-1099.

**André Orléan** received the special Turgot Jury Prize 2012 for "L'empire de la valeur" [The Empire of value] published by Éditions du Seuil, an annual award for the second best book on financial economics.

**Guilhem Cassan**, Ph.D. researcher, received the 2012 economics thesis prize from the French Economics Association for his thesis «État et identité de caste en Inde : une approche économique» [«State and caste identity in India: an economic approach»] supervised by Sylvie Lambert.



Hippolyte d'Albis, 2012 winner of the Best Young Economist

# PhD studies and research: other 2012 highlights

## Future Investments Programme:

The year 2012 was marked by the conclusion of the LabEx (Excellence Laboratories) and IDEFI (Initiatives for Excellence Innovative Training) campaigns under the Future Investments Programme (the aim of these “Future Investments” is to create large, internationally visible and competitive centres or clusters for research or research transfers). The School’s laboratories were involved in a large number of projects. Some were selected in the first wave in February 2011, others in the second wave in the autumn of 2011, after resubmission. The results have been highly satisfactory. Firstly, the School is heavily involved in 5 LabEx, through all its research labs with an A/A+ rating; secondly, it is also a stakeholder in other LabEx, for example L-IPSL in association with Institut Pierre-Simon Laplace.

## Noteworthy in 2012:

### - A new materials LabEx further confirms the reputation of the School’s research

As part of the second wave of the Excellence Laboratories, the international Future Investments Programme juries chose the MMCD project (Multiscale Materials Modelling and Experimentation for Sustainable Development), notably headed by 2 of the School’s laboratories (Laboratoire Navier and CERMICS). This constitutes further recognition of the quality of our research. The results and applications produced by this LabEx are entirely consonant with the School’s performance contract for 2011-2014. The MMCD Excellence Laboratory will receive a grant of €6 million for materials science relating to applications in the energy and civil engineering fields. The LabEx was inaugurated on 30 November by its Scientific Director Philippe Coussot, in the presence of Philippe Cornu, head of LabEx initiatives at the National Research Agency, presidents and chief executives of partner universities and organisations (Université Paris-Est, Université Paris-Est Marne-la-Vallée, Université Paris-Est Créteil, École des Ponts ParisTech, IFSTTAR) and representatives of the project’s backers in the industrial world.

### - Teaching: École des Ponts ParisTech innovation recognised by the selection of 3 IDEFI:

The “d.school” project: a grant of €4,100,000 in collaboration with 4 institutions (ENSAVT, UPEMLV, ESIEE Paris and EIVP), all members of Université Paris-Est. The ambition is to create the first French d.school, with a unique focus on sustainable development found nowhere else in the world. Its remit is to teach innovation through “design thinking” to students and teachers from the partner institutions and the ParisTech network.

## - Active participation in two other projects:

### IDEA or “University differently”: a grant of €7,700,000

IDEA (Individualisation, Diversification, Evaluation and Accompaniment/support) is led by Université Paris-Est, of which the School is a founder member. Its aim is to transform the conditions of induction, education and (re)integration support, and to adapt them to each student. It is therefore applicable to students of all backgrounds and fits into a framework of equal opportunities and intergenerational and intercultural mix. École des Ponts ParisTech also hosted the IDEA launch seminar on Monday, 15 October 2012, at which the papers included a videoconference contribution by Marcel Lebrun and Denis Berthiaume, members of the IDEFI jury. They both agreed to participate in IDEA and to sit on its steering and evaluation committee. The event gave participants an opportunity to share the spirit of IDEA: to develop innovative approaches to the individualisation of educational pathways, a diversification of teaching methods and audiences, a new and cross-disciplinary system of evaluation and greater support right through from entry to integration.

### UTOP (Université de Technologie Ouverte Pluripartenaire [Multi-Partner Open Technology University]): a grant of €5 million

UTOP is headed by UNIT (digital engineering and technology university) of which the School is a member, and which includes other institutions from all over France (Picardie, Nord Pas-de-Calais, Lorraine, PACA, Île-de-France). UNIT brings together public and private higher education actors in engineering sciences and technology, wishing to share and guide best practices in ICT. The purpose of UTOP is to deliver e-learning courses.

Its approach will be modular, individually tailored and focused on technological activities. From a lifelong learning perspective, UTOP will also offer the possibility of developing tailored training packages for companies.

In addition, in relation to the call for projects by IEED (excellence institutes for low-carbon energy), the EFFICACITY project, headed by Veolia, in which Université Paris-Est is a partner, obtained confirmation of its forthcoming accreditation and eligibility for state support. This project focuses on 3 topics: “the built environment of the future” (buildings/mobility/energy), the “intermodal hub as the seed of the city”, and “positive energy blocks”. The School is also involved in the accredited VeDeCoM (Institute of the zero carbon communicating vehicle and its mobility) project via ParisTech and IFSTTAR (joint LVMT laboratory).

The 6 LabEx accredited in 2011 and 2012 began their first practical activities. The themes of these LabEx and their activities in 2012 are listed below (for each LabEx, the School laboratories involved are specified):

- **the “Urban Futures” LabEx (LVMT, CERE, CIRED, LATT, LEESU)** seeks to marry the disciplines of planning, architecture, the environment and transport, and stands at the frontier between social and engineering sciences. It encompasses around 300 teachers-researchers and 290 PhD researchers and is unique in France in terms of its scale dedicated exclusively to urban issues. It seeks to respond in an interdisciplinary and open way to questions about the city. In 2012, the LabEx finished setting up its organisation and issued its first calls for projects, playing its role as a unifying structure, driving research within an inter-laboratory framework: conference organisation, invitations to researchers, post-doc scholarships, summer schools, supporting the publication of works emanating from the LabEx, European Masters programmes in Hamburg, Milan, IFU-IUP, etc... The LabEx is developing interdisciplinary initiatives on a number of emerging themes: “energy and spatial planning”, “environment and spatial planning” or “transport and spatial planning”. Other initiatives are also underway, on walking in the city, tourism planning and the “metropolitan question”.
- **the LabEx for “Sciences, Innovation, Techniques in Society” (LATT)** tackles new aspects of science and technology in society, and of research and innovation policies, such as the variability in innovation processes from one area of activity to another, the role of new functions, the importance of the responsible, social and ethical dimensions of innovation, the transitions of sustainable development, etc. In 2012, the SITES LabEx set up its structure and specified its connection with GIS IFRIS. In addition, researchers at the LabEx’s Marne-la-Vallée campus were involved in the preparation of a plan for a new research unit focusing essentially on the LabEx themes.
- **the “Bézout” LabEx (LIGM, CERMICS)** encompasses Paris-East University’s three mathematics and computer science laboratories rated A+ by AERES (LIGM, CERMICS and LAMA) and is seeking to take advantage of the underexploited synergies between existing mathematics and computer science research and to create an international M2R. In 2012, a CNRS federation was built on the edge of the LabEx, helping to consolidate the cooperation between the three laboratories. In addition, LabEx Bézout set up its structure and, in the spring, recruited its first researchers under the Île-de-France major interest domain (DIM) research funding programme. At the same time, spring 2012 saw the graduation of the first intake of Masters 2 scholarship recipients, all of whom have gone on to do doctoral research
- **the “Open Up Economics” (PJSE) LabEx explores new potential in economics** opened up by access to data, in particular geolocation data, and casts doubt,

amongst other things, on the central paradigm of economic analysis, Homo Economicus (the essentially rational agent), and explores the frontiers with other social sciences. In 2012, the OSE LabEx held the first meeting of its supervisory board (12 July). Based around its five focal areas (“Globalisation and development”, “Inequalities and public economics”, “Economics and social sciences”, “Foundations of individual, strategic and social behaviours”, “Markets and organisations”), discussion workshops were initiated, along with a series of scientific events. In addition, a “Public Policy Institute” was set up: its aim is to become a centre for the assessment of public policies and to foster the quantitative analysis and evaluation of public policies drawing on the latest methods of economics research.

- **the “multiscale materials modelling and experimentation for sustainable construction” LabEx (Laboratoire Navier, CERMICS)** stands at the interface between mechanics and the physics of materials, applied mathematics, numerical modelling, imaging, etc. Its aim is to improve our understanding of civil engineering materials. This entails taking the study of these materials beyond empirical or phenomenological approaches, and constructing a framework of knowledge comparable with what has been done particularly in other areas of physics, for example with crystals, liquids or polymers. In 2012, the LabEx concentrated primarily on its launch and on the first allocations of resources (launch of 5 theses and 2 postdoctoral research programmes and support with the organisation of scientific events).

The school is also involved in the “L-IPSL” LabEx (LMD, CERE), selected in the first wave, which represents a development of Institut Pierre-Simon Laplace, and in the LabEx for “Finance and sustainable growth”, selected in the second wave, which studies finance in the light of the current economic crisis and major socio-economic issues, based around Institut Louis Bachelier

#### Development of the academic chairs:

**Official inauguration of the City Chair:** The school joined forces with AFD (French Development Agency), SUEZ ENVIRONNEMENT and GDF SUEZ to launch this new, three-year City Chair, dedicated to research and teaching on the operation of cities. It was inaugurated on 7 February at the School in the presence of the partners and researchers involved in the project. They came to provide their perspectives and perceptions on the issues and ideas relating to the research and its applications.

**Creation of a new Chair: “Reinventing the station in the 21st century”** with SNCF. The official signature took place on 11 May at École des Ponts ParisTech in the presence of Guillaume Pepy, Chairman of SNCF, Sophie Boissard, Chief Executive of Gares & Connexions, Philippe Courtier, Director of the École and Jérôme Fessard, Chairman of Fondation des Ponts. This 5-year chair will be dedicated to the design, planning,

regulation and management of stations and inter-modal rail hubs.

**The Chair in “Financial Risks”** : this Chair, which brings together the School, École Polytechnique, Université Pierre et Marie Curie, with Société Générale and Fondation du Risque, has been extended for a second five-year term. It is headed by Mme Nicole El Karoui, Professor at UPMC, and coordinated by Benjamin Jourdain (CERMICS) on behalf of the School.

In May, **the Chair in Buildings and Infrastructures Eco-design**, in which the school is a stakeholder, published its first newsletter. It also organised a Chair University on 2 and 3 October, two days of innovative education to help designers and clients to understand and apply eco-design tools to buildings and infrastructures. The two-day session was opened by Xavier Huillard, Chairman and CEO of Vinci.

#### PhD programmes:

**74** École des Ponts ParisTech doctoral theses were presented in 2012 (66 in 2011). Across all the School’s laboratories, 108 doctoral theses were defended in 2012 (106 in 2011). At the end of 2012, there were slightly under 500 PhD students in the School’s laboratories, including 323 École des Ponts ParisTech doctoral researchers registered for their theses at Université Paris-Est.

#### École des Ponts ParisTech’s PhD researchers distinguished themselves in 2012

- **in the Université Paris-Est thesis prizes (theses presented in 2011):**

**Nathalie Aubrun** received the doctoral school “Mathematics and ICT” Prize for her thesis in mathematics, produced at LIGM under the supervision of Marie-Pierre Béal and Mathieu Sablik, with the title “Symbolic dynamics of 2-D systems and infinite trees”;

**Nicolas Oppenchaim** received the doctoral school “City, Transport and Territories” thesis prize for his sociology thesis written at LVMT under the supervision of Marie-Hélène Massot and Francis Godard, with the title: “Day-to-day mobility, socialisation and segregation: an analysis based on the ways of life of teenagers in urban priority zones”

**Vinciane Zabban** received the doctoral school “Organisations, Markets, Institutions” thesis prize for her Sociology thesis, completed at LATTs under the supervision of Patrice Flichy, entitled “This is a world. The sharing of online games: design, techniques and practices.”

- **in the École des Ponts ParisTech thesis prize 2012 (thesis defended in 2011): equal prizewinners**

**Nicolas Oppenchaim** (LVMT) for his thesis “Day-to-day mobility, socialisation and segregation: an analysis based on the ways of life of teenagers in urban priority zones”.

**Sébastien Brisard** for his thesis “Morphological analysis and numerical homogenisation: Application to cement paste”.

- **in the Université Paris-Est thesis prizes (theses presented in 2011):**

The 2012 competition covered the 632 theses presented in the ParisTech Grandes Écoles. The 10 finalists were interviewed by the ParisTech Thesis Prize panel at ESPCI ParisTech. The 10 finalists included: Vinciane Zabban, presented by École des Ponts ParisTech and already winner of the UPE thesis prize.

#### Other prizes and distinctions:

**Award of the first prize from the abertis/École des Ponts ParisTech/IFSTTAR Chair dedicated to “Transport infrastructure management”:** **Equal first in the thesis category: Judith F. Princeton** (Université Paris Est, IFSTTAR) for “Innovative road network operating practices associated with sustainable mobility”. This thesis provides a new way of assessing motorway traffic operations, using level of service as the sole indicator of consequences for congestion, safety and the environment. This original approach can be extended to all dynamic traffic operations on motorway networks. Headed by Professor Simon Cohen, the focus of the abertis Chair is education and research in the field of transport infrastructure management, for students, researchers, teachers and professionals in this sector. Awarded in 2 categories, Masters and PhD, the abertis Prize seeks to encourage and reward research in analysis and modelling that takes an innovative approach to transport infrastructure management. This year, 9 young 2011 graduates entered the Masters category and 6 the PhD Category. The winners received their awards at a ceremony held at the Spanish embassy on Monday 16 April.

**Marouan Iben Taarit** (École des Ponts ParisTech/ Université Paris-Est Marne-la-Vallée) was one of the winners of the prize for the best Masters degree dissertation in quantitative finance awarded by the Natixis Corporate Foundation for quantitative research, for his dissertation on Market Liquidity and Adverse Permanent Effects in Hedging Equity & Interest Rates Derivatives, undertaken at the Crédit Agricole research centre.



# The Documentation, Archives and Heritage Department

The role of the Documentation, Archives and Heritage Department is to accumulate and disseminate knowledge within the School's spheres of expertise.

It is responsible for 2 processes: "managing documentation and the historical legacy" and "managing the archives". The process of "managing documentation and the historical legacy" encompasses the activities of the following 3 sections

- **The teaching resource section via Lesage Library** has the primary function of supporting students throughout their education;
- **The Scientific and Technical Information section** manages the laboratory libraries and electronic resources. It contributes to making scientific publications available on the HAL-ENPC open archive. It provides monitoring and support services in the sphere of scientific publication;
- **The legacy section** is responsible for the historical collections, for preserving and publicising the legacy of the School in coordination with the archive section.

The "managing the archives" process is conducted by the archives section, which is responsible for collecting, processing and preserving the School's archives.

## Key facts and figures 2012

### Libraries, archives and legacy

- a central library open to all users, the Lesage Library;
- 10 research libraries located within the laboratories;

- an archive service, supporting all the School's departments;
- a photo library; historical collections; museum collections.

### Resources in figures

- 200,000 printed and multimedia documents;
- 11,300 archive files;
- 10,000 e-journals, 9500 e-books;
- 16,000 internship reports, student projects and teaching materials;
- 10,000 scientific publications filed with HAL, 1/4 of them full text.

### Systems for disseminating and accessing information

- the HAL-ENPC open archive portal;
- the bibliotheque.enpc.fr document portal, a bibliographical catalogue currently being implemented in SUDOC, theses referenced on theses.fr;
- a blog (lesageblog.enpc.fr), a Flickr account.

### Users and uses

- 25,000 visitors to the Lesage Library, 5400 registered users;
- 14,000 documents delivered, 68,000 articles downloaded;
- 62,000 visits to the document portal and the Lesage blog.



# The Educational Resource Centre and Lesage Library

## Services to the public

The Lesage Library, the School's educational resource centre, experienced a significant rise in use in 2012 with 24% more visits than in 2011. This trend confirmed user interest in the services provided by the library, its working areas and the extended evening opening hours...

## A change in student practices: fewer documents borrowed and more downloads

There was a 30% fall in the borrowing and communication of physical documents compared with 2011. This trend, observed since 2010, can be attributed to the growing use – though limited by the lack of remote access – of electronic resources on a paying basis. It reflects changes in the practices of students, who continue to appreciate the quality of the library's workspaces, as evidenced by the rising footfall statistics, but consume markedly fewer printed documentary resources than their predecessors. Downloads of electronic documents have grown markedly, with 35% more than in 2011.

## Modernised library services and facilities

A large proportion of the library's facilities date back to 1997, the year the School moved onto the Cité Descartes campus. An upgrade is becoming essential. For this purpose, a new RFID document identification and antitheft system was introduced in 2012. The 24,000 self-service documents in the reading room were fitted with RFID chips in the summer of 2012. A new, transparent security entrance, equipped with a visitor counting device, has replaced the old electromagnetic system. Other significant changes were made, such as updating the shelf signage, purchasing 10 new self-service IT terminals to replace the inadequate Wyse terminals, fitting one of the library's two workrooms with a wall mounted TV screen, to facilitate group work.

## Information distribution tools and services

### The School's document portal, [bibliotheque.enpc.fr](http://bibliotheque.enpc.fr)

The School installed its document portal in 2012. This provides a single, simple access route to all the resources needed for teaching and research: a catalogue of the library's 200,000 book collection, a journal index and access to printed and electronic journals, access to electronic books, to 13,000 item photo collection, to the database of student work.



A search engine <[search.enpc.fr](http://search.enpc.fr)>, a single access point to virtually all resources, has been incorporated into the platform and provides an index of 215 million references relevant to researchers and students. Opened to the public in June 2012, the portal has been used 30,000 times..

## Information search training

To coincide with the introduction of the portal, a special effort was made this year, in close concert with the education department, to train students in information retrieval. Between September and December 2012, 425 Masters programme students and MBA participants took workshops on running document searches and the use of the portal and its services.

## Document guides and instructions

To help students make the best of the documentary resources available, the library has introduced guides and communication tools such as the new online 2012 reader guide, as well as themed webpages, such as the Design Thinking library, <http://www.scoop.it/t/bibliotheque-du-design-thinking>, and a site showing the library's new acquisitions <http://www.scoop.it/t/acquisitions-bibliotheque-lesage>. Bibliographies have been specially designed for teaching programmes, such as the documentary guides for the Specialist Masters programme in rail and urban transport systems, the "énergétique urbaine" bibliography, the 2012 bibliography "Le risque dans tous ses états", together with topic-based bibliographies put together for the needs of the SEGF Department.

## Implementation of the bibliographic catalogue in SUDOC

Through a partnership agreement with ABES (higher education bibliographic agency) signed in 2011, the School joined SUDOC (university documentation system). Since April 2012, it has been part of the network of 150 institutions whose bibliographic catalogue can



be accessed via the national catalogue, joining other grandes écoles such as École des Mines, École Centrale. The bibliographical references from the School's catalogue shown in SUDOC are also indexed by Google, and in particular Google Scholar, further increasing their visibility.

In 2012, almost 49,000 notices from the School's catalogue were incorporated into the national catalogue. A massive job of back-conversion remains to be done with the help of ABES, in particular to index research level works in civil engineering and works from the historical collections, which are often missing from the national catalogue. This process has been accompanied by a reorganisation of the document system within the team and training on the tools provided by ABES. As a result, the School's library is now organised like most standard university document systems: all documents entering its collection are directly referenced from the national catalogue then located in the local catalogue.

#### [The Lesage Library blog, lesageblog.enpc.fr](http://lesageblog.enpc.fr)

The blog has continued to progress at a gratifying rate, with 32,000 visits (compared with 21,000 in 2011), 93,000 pages viewed (62,000 in 2011) by more than 16,000 separate visitors (as compared with 11,000 in 2011 and 4000 in 2010). This confirms the level of

interest amongst library users, given that a majority of visitors are subscribers to the blog's RSS feed.

#### [A significant contribution to campus life](#)

The library contributes to the quality of campus life, providing active support for events such as the inaugural lessons and the science cafes.

In November 2012, the Lesage Library organised the first edition of its Meet the Author sessions around the book *Hydrologie quantitative* [quantitative hydrology] published by Springer. Almost 50 people were present to hear the authors, Eric Gaume and Pierre-Alain Roche, teachers in the City, Environment, Transport Department, present the principal themes of their work. In March, the library took part in Cordées de la réussite [Lifelines to success], playing host to more than 60 secondary school pupils.

It received several delegations of visitors, representatives of partner companies and institutions from France and abroad, to show its resources and in particular its always popular historical collections.



## The Scientific and Technical Information section

### Dissemination and exploitation of scientific publications

#### [The HAL-ENPC open archive](#)

In 2012, the School's HAL-ENPC open archive underwent significant development, growing from the 6000 references and publications entered at the end of 2011 to almost 10,000 at the end of 2012.

Almost 36% of the publications referenced include the full text of the document. This gratifying progress is linked with the campaign to educate researchers on the importance of the free circulation of knowledge. It is also the outcome of a project conducted with École Polytechnique and École des Mines, under which the three institutions have developed macros that can retrieve bibliographical references from the Web of Science and Scopus and import them into HAL in XML format.

By creating these macros and adapting them to other bibliographical databases, the School was able to import 585 references into HAL-ENPC in 2012 for LEESU and CIRED. These references will be included in the research reports of laboratories that are undergoing

AERES assessment this year. It should be noted that since 2012, entries in HAL from LEESU, Navier, LVMT and Laboratoire St-Venant have been dynamically integrated into those laboratories' webpages.

Finally, the HAL-ENPC portal can be accessed from the ParisTech schools portal, which unites all the portals and collections of its 12 member schools. It is in second position behind École Polytechnique's HAL-Polytechnique (11,000 documents) in terms of the number of publications referenced, both for the number of references and for the number of full-text documents.

#### [Development of the laboratory libraries](#)

##### [The Olivier Coussy document zone](#)

The fruit of a joint effort with the Laboratoire Navier teams, the Olivier Coussy Library came into being in September 2012. This research level library dedicated to mechanics and the physics of materials, structures and geo-materials, attracts researchers and PhD students from Laboratoire Navier. It contains a collection of almost 4000 works specialising in the relevant areas

of research, and provides direct access to journals and electronic resources.

The laboratory's document collections were previously dispersed around the different units and hence not easily accessible to the academic community, which now enjoys better services in terms of assistance, opening hours, workspaces, loan services, and access, on a paying basis, to the School's electronic resources.

At the request of LVMT, in 2012 the Documentation Department carried out an operation to conduct an inventory and update the library, in preparation for its move to the Bienvenüe building. Similar operations were carried out in 2013 for LATTs, LIGM, CERMICS, CEREAs. The libraries of these last three laboratories will be combined in a shared document zone in the Descartes+ building.

#### **New document monitoring, information support and bibliometric services**

The monitoring process, introduced in 2011 for LEESU on water-related information, continued in 2012 with 22 alerts representing 588 documents collected. In addition, monitoring on environmental economics was set up for CIRED and has already generated 18 alerts with 608 documents collected.

In 2012, the IST Section produced 4 newsletters aimed at researchers on the topics of Open Access, social networks for researchers and tools for managing bibliographical references.

**Introduction of bibliometric activity.** Several bibliometric reports were produced in concert with the research division, as well as recommendations regarding affiliation and methodology on international classifications. The bibliometric indicators produced include joint publications by the School and other institutions such as PSL\*, ENS, X, Mines, UPMC and Dauphine, changes

in publication sectors, and School publications jointly authored with a foreign institution. These indicators were collected in the **2012 Bibliometric Report**.

#### **Initiatives under the Université Paris-Est umbrella**

The School's Documentation Department contributed significantly to the running of the project to implement a joint search engine for the PRES institutions, launched in September 2013.

In addition, an initiative to create an **urbanistic map** for the Cité Descartes campus was launched in concert with the joint UPEC and UPEMLV document sections. All this was in preparation for the opening of the future Paris School of Urbanism in September 2013.

Finally, through its knowledge of scientific publishing and the **problems of procuring electronic resources**, the School is making a significant contribution to the pooling of electronic resource purchases (negotiating licences, studying publishers' economic models). This activity, conducted in close collaboration with the Vice-Chancellor of Université Paris-Est, benefits all the institutions.

#### **Signalling and raising the profile of theses on national databases**

The handling of theses delivered by Université Paris-Est, for the purpose of long-term preservation and Internet visibility, is done jointly by the documentary departments of UPEC, UPEMLV and École des Ponts ParisTech.

The School, in tandem with UPEMLV, handles the theses of three doctoral schools: VTT, SIE and MSTIC. In 2012, these doctoral schools approved 135 applications in ADUM for processing by this duo of document specialists. 133 of these theses are online at theses.fr, TEL and/or Pastel (or an intranet for those not available for public access).



# The Heritage Department

## **A process of digitisation supported by Bibliothèque nationale de France [French National library]**

Since 2007, with the support of Bibliothèque nationale de France, the School has been involved in a massive project to digitise part of its documentary legacy. This project draws on the recommendations of a steering committee made up of experts and researchers in the history of science and technology.

In 2012, more than 110,000 pages, plates or illustrations were digitised. The documents concerned are mission journals, School classes, minutes of School council meetings, Minard's maps, photograph albums of ports, the continuation of the *Annales des Ponts et chaussées*, technical series and legal series, digitisation of the *Annales* for the period 1831-1931 and 1939-2003.

In addition, the School is participating in a mass digitisation operation led by Bibliothèque nationale de France on the main scientific and technical periodicals of the 19th century. In this context, collections of leading periodicals in the field of civil engineering, such as *Revue générale des Chemins de fer* (1878-1942), *Le Génie civil* (1880-1942), *Annales des chemins vicinaux* (1845-1895), *Portefeuille des conducteurs des ponts et chaussées and des gardes mines* (1857-1886), *le Journal du génie civil, des sciences and des arts* (1828-1847) have been made available to the National Library for digitisation. The corpus of works for processing is chosen by the steering committee of the Digital Legacy Library.

## **Digital library projects**

### **École des Ponts ParisTech's digital legacy library**

The year 2012 was dedicated to the identification of the right digitisation software. The school eventually chose the OMEKA open source application, supported by a very active international community of research libraries.

The digital library [patrimoine.enpc.fr](http://patrimoine.enpc.fr) opened in June 2013.

It will form the basis for the wide dissemination of original legacy content held by the School, in all more than 500,000 pages. It will offer virtual exhibitions and ultimately collaborative spaces for commentaries and critical analyses of content. Pending the launch of the digital library, a specialist corpus of some forty texts on the history of lighthouses and marker buoys was published on the global digital library [archive.org](http://archive.org).

### **The library of lighthouses and marker buoys**

The School's "Lighthouses and Marker Buoys" collection was a significant presence in the "Lighthouses" exhibition staged from March to November 2012 at the Musée de la Marine. As well as the loan of objects and photographs, the Maritime Affairs Department wanted to support the project to overhaul the Lighthouse library. The lighthouse document website [bibliothequedesphares.enpc.fr](http://bibliothequedesphares.enpc.fr) opened in 2013.

The coordinating editor is the historian Vincent Guigueno, a teacher at the School.

## **A unique historical legacy, with multiple consultations and searches**

### **Document consultations and historical searches**

The School is regularly approached to respond to a very wide variety of search requests: searches on the

history of the School and its students for the archive section, questions on engineering structures, on the works of engineers for the historical collection. In 2012, we received almost 250 search requests from researchers, PhD students, engineering students and publishers.

More than 400 documents from the historical collection were consulted in situ or were partially digitised and sent to researchers.

Amongst the searches carried out by the archive edition, there were some fifteen genealogical searches.

### **Creation of a biographical list of engineers**

In order to be able to respond quickly to search requests, the archive section has created a biographical file on former students (pre-1930) and their careers.

The information comes from a variety of sources in the archives.

So far, 1297 engineer records have been entered, out of an overall total estimated at 3000. This list will make it possible to respond quickly to search requests.

### **How to find a Ponts et Chaussées Administration engineer?**

The archive section has published an instruction page on the website to help searchers find former engineers who worked in the ponts et chaussées administration. In fact, the repeated requests for named searches on engineers of all backgrounds made it necessary to clarify the different sections within that administration, drawing on existing sources in the School and elsewhere.

This page is a much frequented part of the School website. <http://www.enpc.fr/comment-rechercher-un-ingenieur-de-ladministration-des-ponts-et-chaussees>

### **Document loans for exhibitions and the dissemination of legacy documents**

Documents or legacy items are often lent out for exhibitions. In 2012, sixty works were lent out for three exhibitions:

- the exhibition on lighthouses at Musée de la Marine;
- the exhibition on Alexandre Terpereau, photographer (1860-1890) at the Bordeaux Departmental Archives;
- the exhibition on Gustave Caillebotte, impressionist, and photography at Schirn Kunsthalle in Frankfurt.

The School granted distribution rights for 170 documents, drawings, photographs, plates and maps to more than thirty organisations, including Réunion des Musées Nationaux, Elsevier, les éditions de la Villette, several departmental archives and various local authorities.

### **Conservation and enhancement of heritage and museum collections**

#### **The School's collection of busts**

The School's collection of busts, repatriated in 2008 from the School's historical address on rue des Saints-Pères in Paris, has not yet found its place at Champs-sur-Marne. Four new busts were placed in the School's main building, the engineers Vicat, Cauchy, Reynaud and Fresnel. Planned 3-D models of these busts, a project run by engineering students and overseen by a researcher at LIGM, should be completed

in 2013, thereby providing wider access to this original collection.

#### **The instrument collection**

A preliminary identification of instruments from the precision instruments repository had been made. This collection, which has almost completely disappeared, was used both for the teaching of students in the 19th century and the first half of the 20th, and by engineers in the departments. The results of this task, undertaken with the help of a scientist specialising in old instruments, may be made available on the School website or perhaps in a publication.

#### **Adding to the collections**

At the Drouot Sales Rooms, the School acquired a set of 22 silver photographic prints dating from 1896, showing the construction of a metro line in Paris. A Sèvres porcelain bust representing Sadi Carnot, student at the School (1860-1863), Minister of Public

Works (1878-1881) and finally President of the Republic (1887-1894) was acquired at auction.

#### **Protecting the legacy: dusting, restoration**

The library's reading room, which had not been dusted since 1997, and a basement storeroom, were cleaned in the course of the year.

The main restoration work, an essential measure of preventive conservation, was done on the drawing collection, which has been an object of special interest since 2001. Indeed, the restoration of the drawings will open up these unique and very popular documents to wider access. Around 8% of the collection has been restored, out of a total of 3245 items. Part of this restoration work is funded from loans of items to outside bodies.

In 2012, work was done on twenty 18th-19th century drawings of student examinations, 2 posters, 1 brochure, 4 manuscripts, 1 Second Empire student uniform (1860-1870).

## The "Archives" section

### **Application to Archives de France for autonomy in archive management**

In 2010, the School put in a request to Archives de France for autonomy in the management of its archives. In 2011, the School archives were inspected by the Heritage Inspectorate, which drew up recommendations. The implementation of these recommendations, a prior condition for the acceptance of autonomy of management, was assessed in 2013.

The main activities carried out in 2012 were therefore directly linked to these recommendations.

Following the inspection, the school undertook work to improve its archive function:

- a qualified assistant archivist was recruited at the end of 2011 for a period of 18 months;
- the Director of the School asked for a master plan of the archives to be drawn up;
- the archives section became an archives and conservation section.

### **The quality approach**

The "archive management" process was audited internally in summer 2012. The archives are very tightly managed and regulated by law, and subject to very structured procedures. The "receiving archive transfers" and "communicating archives" procedures have, for example, existed since 1999. The internal audit classified the archive process as Level 3, i.e. at the higher level of "formalised and managed approach, based on processes".

### **Production of the School's management charts and classification plan**

One of the requirements of the Heritage Inspectorate was for progress in the overhaul of the archive management charts. This operation was finalised for the teaching department at the beginning of 2013.

### **Revising the handling of contemporary archives**

The quantity of unsatisfactory transfers requiring revision is estimated at around 170 linear metres (lm). In 2012, 40 lm were revised by the assistant archivist. There remain a further 130 lm which are more difficult to handle and which will need to be checked before classification, with a description of the collections followed by digitisation of the paper transfer forms.

A "statement of archive transfers carried out from 1995 to 2012", a search instrument previously missing for this period, has been created..

### **The laboratory archives: An exceptional operation with a big impact in 2013**

Five laboratories moved in 2013 (CERMICS, LIGM-ex-Certis, LATTs, LVMT, CEREa). One of the Navier Laboratory teams, LMSGC, also moved from the Kepler building to the School's central building.

Against this background and after consultation with the research division, three laboratories were approached in order to organise the transfer of their archives prior to the move.

A base estimate of 160 linear metres was established for these 3 laboratories alone. An archive management chart was communicated to LATTs, the oldest of the laboratories with the largest and most scattered archives (almost 100 lm). The linear length and estimated workload remain to be specified for the other labs.

These operations demanded a major effort in 2013 (checking, identifying, sorting, classifying, describing).

In addition, an archive storeroom is being established in the Bienvenüe building for the needs of the School's labs.

### **Transfers, eliminations, communications**

In 2013, 31 new transfers were carried out, i.e. an increase in the archive of 56.40 lm (including archives from parties who had left the School).

10 transfers were eliminated, i.e. 24.80 linear metres, plus the removal of duplications during checking of the existing archives.

However, these eliminations do not offset the increase.

535 files were communicated to the new departments, particularly the General Secretariat and Accounts Agency, under the different audits carried out in 2012.

### **Electronic archiving**

The Archives Section provided expertise for the project of converting payslips to electronic format, using the sample payslip kept by the School. This project, led by the SRH with the support of the Archives Section, has been implemented by the IT Department.

In concert with the quality and IT departments, the Archives Section is working on other electronic management projects.

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as at 1 January 2014

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# Resources of the School (excluding exceptional items)

## Resources

|   |         |
|---|---------|
| public service subsidy from sponsoring ministry – MEDDE | €30.5 M |
| lifelong learning tax collected                         | €1.1 M  |
| research contracts                                      | €6.5 M  |
| tuition fees  | €3.9 M  |
| training  | €10.6 M |
| other resources   | €2.2 M  |

## Expenditure in 2012 (total expenditure):

|                        |        |
|------------------------|--------|
| Ponts Training Council | €8.5 M |
| MIB Development        | €2.1 M |

# École des Ponts ParisTech – key dates

1747

## École nationale des ponts et chaussées

**1747** The foundation of the School dates back to an order of the King's Council of 14 February 1747, proposed by Charles-Daniel Trudaine, Intendant of Finances responsible for the "details of bridges and roads". The purpose of this initiative was to convert the King's Draughtsman's Office, created in 1744, into a place of education for the different activities associated with bridges and roads. The School's first director, Jean-Rodolphe Perronet, who held the post for 47 years until his death in 1794, developed a syllabus based on apprenticeship and tutoring.

**With the Revolution**, the School's recruitment became "national", with admission by examination. Teaching was free of charge and students received a fixed grant. After the creation of École polytechnique in 1794, École nationale des ponts et chaussées became one of its outlet schools.

In 1796, Jacques-Élie Lamblardie, Director of the School (1796-1797), prompted the creation of the first two teaching chairs, one in applied sciences (mechanics, descriptive geometry and machines) and the other in construction (architecture and public works). The lecture-based syllabus, structured by Gaspard Riche de Prony, Director of the School (1798-1839), constituted the final break with the method of instruction inherited from Perronet.

**1830** Previously restricted to former École polytechnique students who had chosen the bridges and roads service on leaving, from 1830, the School begins to admit former École polytechnique students who had not made this choice.

**1831** Creation of the Bridges and Roads Laboratory within the School. This is the world's first civil engineering research laboratory. It would become the laboratoire central des ponts et chaussées in 1949 then IFSSTAR on 1 January 2011, following the merger with INRETS

**1851** A new decree sets the official seal of approval on all the improvements in the operation of the School introduced over the years. Amongst the innovations approved was the admission of new "external" students, from France or abroad.

**1851 to 1923** Beginning as early as the 18th century, the process of internationalisation develops during the Industrial Revolution, when 40% of registered civil students were foreigners, which explains the School's strong international reputation..

## to École des Ponts ParisTech

2013

**1993** The School becomes a major institution operating under the aegis of the Ministry of Ecology, Sustainable Development and Energy (MEDDE), with as its "primary mission the initial and ongoing training of engineers possessing high-level scientific, technical and general capacities suiting them to the exercise of positions of responsibility in the fields of infrastructure, planning, construction, transport, industry and the environment. In its areas of competence, the School conducts research and contributes to the dissemination of knowledge. It exercises its activities both nationally and internationally."

**2007** The School is a founder member of two research and higher education clusters (PRES): Université Paris-Est

(UPEMLV, UPEC, IFSTTAR, ESIEE Paris, ENVA, CNRS, INSERM), to which it transfers its PhD Programmes, and ParisTech (AgroParisTech, Arts and Métiers, ENSAE, Chimie Paris, MINES Paris, ENSTA, Télécom Paris, ESPCI, École Polytechnique, HEC, Institut d'Optique). It is also a founding member of a thematic advanced research network: Paris School of Economics (EHESS, ENS, Université Paris 1 Panthéon-Sorbonne, INRA, CNRS).

**2008** École nationale des ponts et chaussées adopts the brand name "École des Ponts ParisTech".

**2008-2009** Sale of Hôtel de Fleury, rue des Saints-Pères, the School's headquarters since 1850, purchase and inauguration of "Maison des Ponts".

**2010** Ponts Alliance, the alumni association, celebrates its 150th anniversary.

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- management
- departments of Education, Research, Communication, International Relations
- general secretariat
- information systems department
- document department
- research laboratories located at Cité Descartes
- accounts agency
- student residences

## Paris

La Maison des Ponts

15, rue de la Fontaine-au-Roi

75011 Paris

- Ponts Alliance, The School's Alumni Association
- Fondation des Ponts
- Ponts Formation Conseil, lifelong learning
- ENPC MBA Paris
- IHEDATE (Institute of further studies in regional development and planning in Europe)
- learned societies: Association pour la Connaissance des Travaux Publics (ASCO T-P), Association Française du Génie Parasismique (AFPS) and AFGC (Association Française de Génie Civil)
- Presses des Ponts



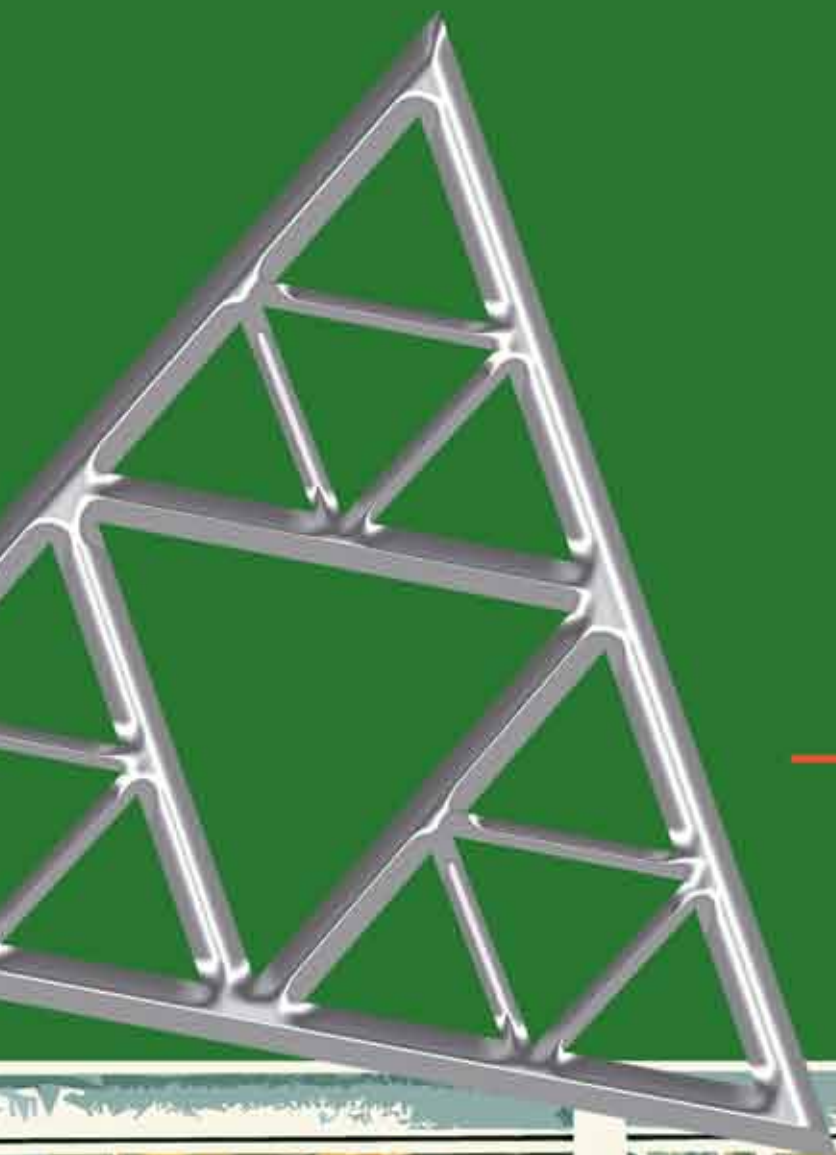
Jean-Rodolphe Perronet (1708-1794), first director of the School



TRAINING

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