ParisTech

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EDITORIAL

In January France took over the presidency of the European Union, ushering in an exciting period for higher education in Europe. Several education-related events have already been organised, notably the Forum of Universities for the Future of Europe. Against this backdrop, ParisTech is keener than ever to showcase France as a centre of excellence for engineering education.

For the schools, this means producing not just engineers, but entrepreneurs and innovative thinkers who can develop scientific and technological solutions to address the most pressing issues of the 21st century. All students have access to entrepreneurial training, ranging from basic introductory sessions to support for starting a business, and every year the schools witness the birth of innovative projects and startups as students across the network seize the opportunity to develop their entrepreneurial skills.

Several schools are also promoting the unique features and advantages of French engineering qualifications at a European level through their involvement in the EELISA alliance, which aims to create an EU-wide engineering degree.

And last but not least, ParisTech has published a book celebrating 30 years of research and teaching in science and technology. You can read it in print or online on the ParisTech website (French only).

FEATURE

Entrepreneurial training at the ParisTech schools

PHILIPPE BOUYER
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How do you support students interested in becoming entrepreneurs or starting their own business?

PB: In 2006 we created an optional "Innovation & Entrepreneurship" stream on our engineering course to identify students with a flair for entrepreneurship and help them develop their skills. Some have their own idea for a product or business, and others choose to tackle innovation projects on behalf of companies, technology centres, academic institutions, labs and so on. That means external companies can find a team to take their ideas from the drawing board to the marketplace. The first year is all about introducing students to the world of entrepreneurship and helping them work out whether it's the right path for them. In their second and third year, students' timetables are adjusted to allow them to spend one day per week (plus some whole weeks) working on their project. They can immerse themselves in the entrepreneurial world, spend time in fablabs to develop prototypes, and talk with their supervisors. Our teams of student entrepreneurs start by reflecting on what they want to achieve. Their supervisors, along with external investors and businesses, encourage students to think about their solution and how they'll approach the market. Students visit the premises of companies in relevant sectors to get a better idea of real-world conditions and any adjustments they might need to make. Once they have a sound project, we get them to think about their long-term strategy and business model. We introduce new challenges and help the project take shape. After nine months, students start working on their business plan and prototype. Then, in their third year, it's time to actually create the product and company. Students benefit from the same teaching and achieve the same qualification as their peers. There's no obligation for students to start a company, but we support those that do by offering them a place in our

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entrepreneurial hubs, where they can get expert advice. Further support is available through our partnerships with external business schools and advisors.

SC: At Arts et Métiers we have a study route called PEIT, which stands for Technological Innovation and Entrepreneurship Stream. It was set up in 2019 and combines conventional teaching with individual support for young entrepreneurs. Students who follow this route can design, develop, test and launch their product or solution both in France and abroad, benefiting from the best of the local ecosystems they're involved in. PEIT is for students who want to start their own business and/or develop innovative technologies in an industrial R&D setting. We run two different programmes. The first, our "Innovation & Entrepreneurship Academy", is for students with their own entrepreneurial project, and the second, "Innovative Product Creation" is for students who want to work on a business innovation project arranged by Arts et Métiers. All first-year students on our Grande École programme take an introductory module on entrepreneurship. Those interested in creating their own business or product or leading an innovation project within an external company can then choose to follow the PEIT stream in their second year, alongside their usual engineering classes.

Arts et Métiers: 20 students selected each year (out of **100** candidates); **80** projects since 2019

Institut d'Optique: Over **150** projects completed for external companies and **20** companies created since 2006; **200-400** jobs created; more than **100** innovation prizes

Can you give some examples of projects or companies launched by students at your school?

PB: Stereolabs was one of the first companies created by our E&I students, and it now has two branches in the United States. The founders initially wanted to design imaging systems for use in a medical context, but economically speaking this turned out to be too complicated. They switched to focusing on 3D imaging and developed a product that went on to rival – and ultimately beat – the best in the 3D film industry. Another example is Effilux, who design and manufacture LED lighting solutions. The company was recently acquired by the world leader in the field, which shows just how successful they've been. And lastly, there's the EthyloWheel project, where students are creating optical sensors for built-in breathalysers for cars.

SC: There's Zozio, who provide production management tools, and Médusa, a company founded by two of our students. They sell top-of-the-range electric motorbikes manufactured entirely in France using traditional methods. One of the goals of PEIT is to create close ties between student projects and the world of research. We see research as a valuable methodological tool that gives students access to technological expertise and helps them develop innovative products. Indeed, lots of students pursue their ideas at PhD level. We also keep in touch with our student entrepreneurs after they graduate to find out how many go on to create companies once they have real-world experience behind them.

SOFIA COSTA D'AGUIAR
EELISA Executive Director

SOPHIE GRIVEAU
EELISA Dean of Studies

EELISA, the European Engineering Learning Innovation Science Alliance, is one of the 41 European universities funded by the European Commission (Erasmus+). The alliance aims to transform the European engineering landscape by developing a higher education programme that is geared towards the biggest challenges currently facing humanity and that qualifies graduates to work anywhere in the European Union.

How do the EELISA partners work together?

SCA: Everyone is in touch with everyone else, which helps develop strong ties across the alliance. At the same time, the diversity of our member institutions is something we really value, so each member remains independent. Each partner heads up one of our nine working groups, and appoints representatives to all the other groups.

SG: Across the consortium, academic staff and students alike are keen to get involved in EELISA, which they can do through our working groups. Each group focuses on a specific topic. We've found that this model works very well.

Can you tell us more about your work on a European engineering degree?

SG: Our goal is to produce top-level European scientists and engineers who are equipped to tackle the complex challenges facing society today. Defining an EU-wide qualification is very much a collaborative task. To decide on the content and level and come up with a solution that works for everyone, we need input from all the institutions involved.

What is the role of the ParisTech schools?

SCA: The ParisTech schools have a key role to play in determining what our "European engineer" will look like. Each institution has its own national regulatory framework. We've got to make sure we understand those, and then combine them in a single European framework – that's the job of the École des Ponts ParisTech. Chimie ParisTech – PSL is developing the content of the framework and looking at other aspects like staff training, multilingualism and so on. And MINES ParisTech – PSL is leading reflection on student mobility, inclusion and engagement.

SG: The École des Ponts ParisTech (with input from the other institutions) is working with accreditation bodies to get the degree accredited by various national and European authorities. It's an essential but demanding task! As well as the core programme and modules – which students will be able to take at any member institution – there's also internships and perhaps even summer schools to consider. Chimie ParisTech – PSL is tasked with defining the European engineering degree and setting up an EELISA course catalogue for students.

What are your plans for this year?

SCA: We're planning lots of collaborative sessions to strengthen the alliance and set up communities based on the 17 Sustainable Development Goals. EELISA provides a neutral space where we can talk, share ideas, and set up platforms open to stakeholders from across the engineering world – people involved in innovation and research, businesses, NGOs and associations and more. This facilitates knowledge-sharing, which in turn sparks new ideas for addressing pressing issues. We're going to set up a research-based learning model to share best practices and answer questions like "How can we bring research into the classroom?" and "How can we combine teaching and research and attract students – as early as possible – to careers in science and engineering?" Plans are also underway for an "EELISA Employability Forum" to promote career opportunities across Europe.

SG: We'll be stepping up our efforts to inform students about the mobility and exchange programmes offered by each institution so that they can plan ahead and get involved in one of the EELISA communities. We hope that with France having taken over the presidency of the EU Council, we'll be able to set up a European degree or another kind of qualification. That would be a good basis for setting up other courses in line with EELISA's vision – a Bachelor's degree for example.

More than **500** students took part in a mobility or exchange programme in 2020/2021

180,000 students

36 agreements

11,000 admin staff

16,000 academic staff

THE LATEST FROM PARISTECH

COMMUNICATION

The ParisTech network has published a book to celebrate its 30-year history as a provider of STEM education. The book tells the story of the people who, in a higher education landscape that has seen many changes over the years, have made the network what it is today – students, lecturers and researchers, admin staff, academic partners, businesses. The book's chapters reflect the core values that brought the schools together and continue to underpin their activities as they educate the next generation of scientists and engineers. It is available in print and online (French only).

Excellence – Internationalisation – Diversity – Innovation – Solidarity

DIVERSITY

On Saturday 22nd January, ParisTech organised a special event in honour of the "Cordées de la réussite" initiative – the 11th of its kind. Despite having to move online due to COVID restrictions, the event was a great success. Teaching staff from ParisTech ran taster sessions for *lycée* students (age 15–18), giving them a glimpse of what it would be like to study at an engineering school. Topics included "An introduction to statistical physics: temperature and crowds", "Eco-design and the circular economy: examples from the digital sector", "Food formulation" and "Nuclear energy: chemistry in nuclear electricity production". Afterwards, the students had chance to talk to current students from the ParisTech schools and partner institutions and get answers to all their questions. An inspiring event for all involved!

TEACHING

On 9th February, the ParisTech schools visited the d.school of the École des Ponts ParisTech. Led by Fabien Eychenne, Director of the d.school, the event saw lecturers, researchers, instructional designers and leaders of entrepreneurship schemes come together to discuss design thinking and plenty more besides. Attendees learned about the centre's history, what role it plays in the curriculum (in particular in the core course followed by all engineering students), and how businesses are involved in the centre's development and student projects. Discussions were fruitful, and all who attended came away with lots of new ideas!

For the past few months, the Teaching Commission has been looking into how entrepreneurship training is built into the programmes offered across the network. The schools were asked to present the schemes and support available to students and alumni interested in starting their own business or getting involved in innovation projects, the aim being to share ideas across the network. Given that each school is unique and has its own goals and approach, the wealth of information shared was no surprise! At the same time, it was clear that the schools face similar challenges – challenges that can be overcome by sharing ideas and experience. You can read about the different training and support on offer across the network in the schools' presentation.

INTERNATIONAL

After two cancellations and a hybrid version last March, the ATHENS programme finally returned to Paris at the end of last year. On 13th November, 300 students from member institutions across Europe gathered at MINES ParisTech – PSL in Paris, eager to start the week's activities. Across Europe, almost 1,500 students took part in ATHENS week. A choice of 71 intensive courses was on offer, including 44 at schools in Paris (AgroParisTech, Arts et Métiers, Chimie ParisTech – PSL, École des Ponts ParisTech, Institut d'Optique, MINES ParisTech – PSL, Télécom Paris). For a glimpse of what the programme involves, take a look at this video documenting ATHENS week in Prague.

This year will see ParisTech host an International Summer School. Running from 1st to 15th July 2022, the programme is aimed at 3rd and 4th year undergraduates from across the globe, and its theme is "A journey through heritage, innovation and sustainability". The programme includes tours of the ParisTech schools, lectures on advanced topics in a range of fields, small group activities and cultural outings to allow students to explore Paris and the surrounding area. It's set to be a fantastic international and intercultural experience! Read more on our Study With Us site.

INTERNATIONAL AGREEMENTS

Agreements
Renewal of Cooperation Agreement with UFSCar (Brazil)
Renewal of the agreement with the China Scholarship Council (doctoral grants)

Arts et Métiers

AMJE Paris awarded the ENGIE Positive Impact Prize

AMJE Paris, the Arts et Métiers Junior Enterprise, has received a prize from the French National Confederation of Junior Enterprises for its "Women in industry" event, which encouraged participants to reflect on and address gender equality in industry. Find out more on the Arts et Métiers website (in French).

JOURNÉE NATIONALE DU HANDICAP

Chimie ParisTech — PSL

Disability awareness day at Chimie ParisTech – PSL

Chimie ParisTech – PSL marked the International Day of Persons with Disabilities by holding a disability awareness day, reflecting its commitment to promote diversity. Participants were invited to step into the shoes of someone with a disability through three immersive workshops: one on learning disabilities, one on blindness and visual impairments, and one on sign language. Both students and staff were keen to learn more and speak to the workshop leaders, and after the sessions, attendees had chance to talk about how the simulation exercises made them feel. Everyone agreed that the event was a great success!

École des Ponts ParisTech

Visit from Moussa Diaby, Director General of INP-HB (Ivory Coast)

On 5th January 2022, the École des Ponts ParisTech received a visit from Moussa Diaby, Director General of Ivory Coast higher education institute INP-HB (Institut National Polytechnique – Houphouët-Boigny). The school's director Sophie Mougard and her team showed Dr Diaby around the school and presented the range of courses on offer. The group also took some time to explore the heritage collections in the school's archives, and discovered that relations between their two institutions dated back to the early 1970s.

MINES ParisTech — PSL

Chloé-Agathe Azencott – advancing Artificial Intelligence and inspiring women

Chloé-Agathe Azencott, Associate Professor at the Centre for Computational Biology (CBIO) at MINES ParisTech – PSL has been awarded the "Young AI Engineer" award. The award was presented on 8th November 2021 during the closing ceremony of the "France is AI" conference. It is given to a woman engineer in France working in the field of AI in recognition of her achievements, her involvement in the AI ecosystem, and her ability to inspire others. The jury members were unanimous in their decision to award Ms Azencott the prize!

ParisTech,
the major engineering schools network

The complementary nature of the areas of excellence of the various schools provides our students, researchers and partners (academic and corporate) with an exceptional consortium that offers unique transdisciplinary opportunities. ParisTech also has strong international teaching and research links via its many partnership agreements.

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