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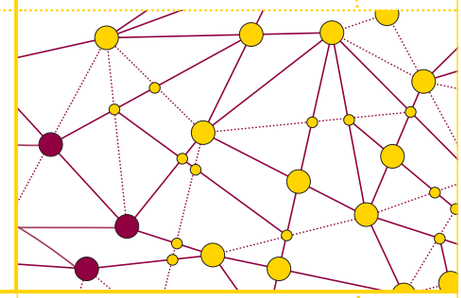
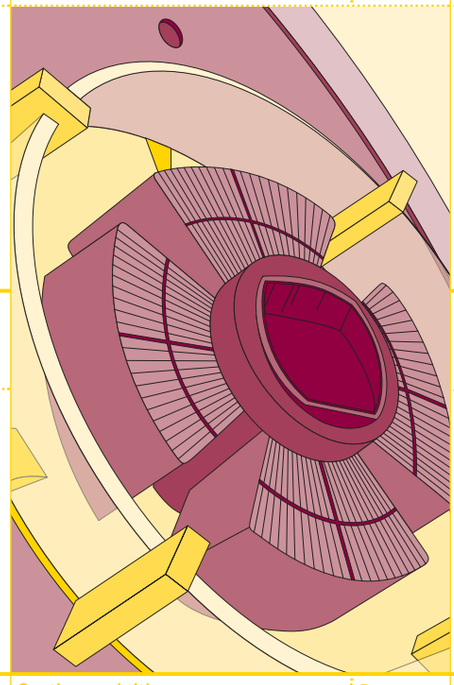
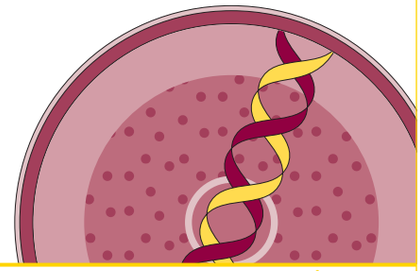


Title

INTEGRATING UPSACLAY PHD STUDENTS HAS OPENED UP NEW HORIZONS



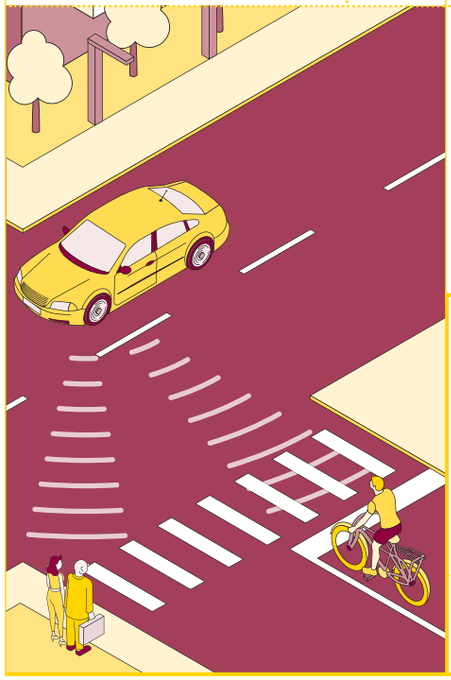


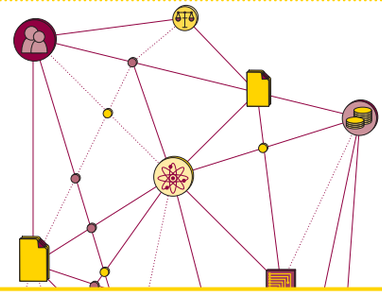
Title

HARD TIMES FOR CLIMATE SCEPTICS!

Title

PARTNERSHIP BETWEEN UNIVERSITÉ PARIS-SACLAY AND MCGILL UNIVERSITY





Title

BEGINNING OF NEW BUILDING WORK FOR THE BIOLOGY-PHARMACY-CHEMISTRY DIVISION

université PARIS-SACLAY

Address: Espace technologique, Bât. Discovery – RD 128 – 2e étage, 91190 Saint-Aubin – France

Website: universite-paris-saclay.fr

STUDENTS

© Sandrine_Lacombe-UPSud

The **Erasmus Mundus Master "Surface, Electro, Radiation and Photo-chemistry" (SERP-Chem)** led by University Paris-Sud, University Paris-Saclay, in collaboration with three European universities has been given the label **"Success Story"** by the European Commission.

The students of the **ArrowDynamics team working on the UAV (Unmanned Aerial Vehicle) project, a CentraleSupélec Experience, received the first prize in the AéroSaclay Challenge.** Their project promotes the idea of "optimizing the airfield traffic pattern to reduce disturbance for neighbours".

A team of six CentraleSupélec student engineers came second in the 2017-2018 **Dassault UAV Challenge**, organised by Dassault Aviation. This challenge involves construction of a drone with six motors and conception of systems and algorithms for independent flight, in order to carry out certain missions.

RESEARCH

Semen Gabyshev, a Siberian reindeer herder and co-researcher at the CEARC (Cultures – Environments – Arctic – Representations – Climate), a laboratory affiliated to the Observatory of Versailles Saint-Quentin-en-Yvelines, was appointed **"Knight in the National Order Academic Palms"**, for his contribution to strengthening cooperation and exchange between France and Russia and integrating indigenous knowledge into interdisciplinary research on climate and environmental change, in Siberia, for more than five years.

Antoine Girard, researcher at the Signals and Systems Laboratory (CentraleSupélec/ CNRS / University Paris-Sud) received the **"European Control Award" at the European Control Conference**, which is where academia and industry working in the field of systems and controls meet.

Julie Grollier, researcher in the Mixed Physics Unit CNRS/Thales (CNRS / Thales / University Paris-Sud), was rewarded the **2018 CNRS silver medal**. Her research, which combines physics and artificial intelligence, aims to develop useful and intelligent low power consumption "green" electronic chips.

Pierre Ladevèze, Professor emeritus of the Mechanics and Technology Laboratory (École nationale supérieure Paris-Saclay), was awarded **the Gauss-Newton 2018 medal** for his contribution in computational mechanics.

Delphine Marris-Morini, Professor at the Nanoscience and Nanotechnology Centre (CNRS / University Paris-Sud), was awarded the prize Fabry – de Gramont 2017, by the French Optical Society, to recognise her work in the field of photonics, integrated optoelectronic devices.

BUSINESS

The start-up **SWIRIS**, run by students of the Optics Institute Graduate school, is winner of the **"innovation prize of the Paris-Saclay competition for ideas for starting a business"**. It develops high-performance SWIR (Short-wave Infrared) vision solutions.

The **RedFal** project (Research and Destruction of Asian Hornets using Laser), run by students of the Optic Institute Graduate School and AgroParisTech, is winner of the **"start-up prize of the Paris-Saclay competition for ideas for starting a business"**. The project aims to provide an effective solution against Asian hornets thanks to a device placed on the hive, which will detect their arrival and eliminate them by laser rays.

The following projects are winners of the **National Contest for Assistance to the Creation of Innovative Technology Companies, the "i-Lab"**:
Dreampore, run by Bertrand Damart, has developed a nanopore-based sequencing technology of macromolecules (Laboratory of Analysis and Design for Biology and Environment – CEA / CNRS / University of Cergy-Pontoise / University of Évry Val-d'Essonne).
FiGaRo (Fine gain in resolution), run by Denis Gascon, offers to commercialise optical microscopes that enable cheap high resolution, in a simple way (Institute of integrative biology of the cell – CEA / CNRS / University Paris-Sud).

The following projects are winners of the **"Grand Prize" of the 2018 contest, the "i-lab": Exotrail**, run by David Henri, has developed an effective and cheap innovative propeller for small satellites (Integration and Test Platform of the Observatory of Versailles Saint-Quentin-en-Yvelines – CNRS / University of Versailles-Saint-Quentin-en-Yvelines);
The start-up **Quandela** (project Cryodelight), run by Valérian Giesz, develops components for the quantum industry enabling to speed up computing time of quantum technologies by several orders of magnitude (Nanoscience and Nanotechnology Centre – CNRS/ University Paris-Sud).

EDITOR'S LETTER

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At the start of the 2018 academic university year, artificial intelligence (AI) is omnipresent: natural sciences, R&D, business, human and social sciences, the subject monopolizes media and decision-makers' interest as "creating intelligence" is an enchanting prospect that will bring great change to our everyday lives.

Everywhere in the world, laboratories that have been working for dozens of years on the subject continue to invent the future. We met them these last few months in the United States, in China, in Canada, in Taiwan, in Japan, in Germany and in India. The University Paris-Saclay has many assets that have been recognised by international partners and we have chosen to present them in this new issue of *L'Édition*. The University distinguishes itself in particular, in mathematical aspects, which enables breakthroughs in AI.

In the last two years, our Centre for Data Science (CDS) has for example brought together an important community of 350 experts and users of AI and concrete action has resulted in significant progress, both in terms of research in AI, as in interface tools and applications. The CDS initiative to organize challenges, which are one of the key AI research methods, has given the Centre international visibility.

"The University distinguishes itself in particular, in mathematical aspects, which enables breakthroughs in AI."

More recently, the labelling of the Convergence Institute of University Paris-Saclay DATAIA, has been another crucial step in uniting the forces of our ecosystem. It will be completed by the creation of SACLAY AI INITIATIVE, two research platforms of materials and software adapted to AI algorithms that will be available by the end of 2018.

The challenge for high-ranking university poles, such as ours, resides specifically in the training that we dispense to our students, which must include pertinent AI modules in the required fields. We are responsible for providing, not only the best available scientific knowledge, but also the societal and ethical dimension, in a field where a controlled and carefully thought out approach is at the heart of development.

Gilles Bloch,
President of University Paris-Saclay

Keywords
Professional insertion – PhD students – Bachelor

Title

Integrating Paris-Saclay doctors has opened up new horizons

They enter into the professional world with ease, either into public or private research centres. They earn a good living, although wage discrimination is still an issue. These points were revealed by a survey on insertion conducted on Paris-Saclay PhD students.

In the spring of 2017, all PhD students of the University Paris-Saclay were asked to reply to a same questionnaire on their professional future, developed jointly by the University and the Ministry of Higher Education, Research and Innovation. *"Previously, each institute had its own set of questions and we would collect inhomogeneous data about PhD students' insertion"* recalls Sylvie Pommier, Head of the PhD College of University Paris-Saclay.

The first good news of this survey is the *"participation rate, which is equal to 72%, well above the national average of around 30%"*, Sylvie Pommier is pleased to say. *"This rate shows that not only have the supervisors and the PhD students built good relationships but also that we have a good relationship with the supervisors"*, adds Sylvie Pommier.

The second good news is the high insertion rate of University Paris-Saclay former students: 92.4%. *"The great majority now work in research, 30% work for companies or have gone abroad to do post-docs"*, explains Sylvie Pommier.

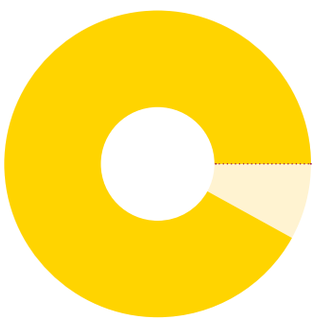
> **"In the spring of 2017, all PhD students of the University Paris-Saclay were asked to reply to a same questionnaire on their professional future."**

Less good news however, is the disparity in wages between men and women. Women working in companies are paid an average of 10% less *"but this differential can reach 25% in the field of Communication and Information Science and Technology"* says a concerned Sylvie Pommier. A solution has already been implemented: *"We have set up a partnership with the 'Women and Science' association for mentoring actions of PhD students, in order to help them in the course of their future careers. We will mainly draw the mentors from the pool of our former graduates. And this won't be our only course of action"*, promises Sylvie Pommier. She also insists on the good level of salary of the PhD students. *"The point of this survey is also to overcome prejudices and stereotypes of doctorates"*, she concludes.

More informations on the plateform PhD Future: https://www.universite-paris-saclay.fr/fr/apres

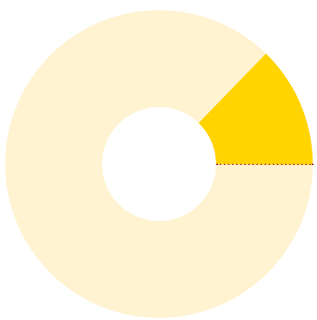
72%

percentage of PhD students who responded to the survey.



92,4%

insertion rate of former Paris-Saclay students.



10%

disparity in salary between men and women in companies.

Story

Rami Bechara

© JLS

« After earning my doctorate in Pharmacy from the University Saint-Joseph in Lebanon, I came to France to prepare a M2 in immunology at Paris-Sud. I then pursued with a thesis in immunology on allergies to chemical products and drugs. I defended my thesis in December 2017 and received my PhD in June 2018. But my insertion started well before. During my thesis I hesitated between a career in the industry or in academic research. Research however was more appealing to me. During my second year of thesis, I gave third year pharmacy students directed learning classes. "Why not keep going?", I wondered.
I therefore renewed my monitor status in the third year of my thesis. As a temporary lecturer and research assistant (Ater), I gave 294 hours of lessons a year and I could pursue my research on the side. It is the advantage of the university: you are encouraged very early on to worry about what you will do after the thesis. There are opportunities that enable us to get our careers on the right track. When my Ater position ends, I will go to Pittsburgh, in the USA, to work on autoimmune illnesses. Thanks to the university I was able to select a very good post-doc. »

Rami Bechara defended his thesis in December 2017. But his professional insertion started much sooner thanks to the university.

Title

Institute Villebon – *Georges Charpak*, innovative practical teaching methods and developer of talents

© A Gilson

Institute Villebon – Georges Charpak* offers students with very varied profiles, holding a Baccalaureate, a Bachelor in Sciences and Technology with a innovative teaching approach that opens up new possibilities.

"I hadn't previously imagined how stimulating and interesting it was to meet different people", confided Brice Tayama who is today in second year at the AgroParis Tech school. *"There are no words strong enough to express how much the Institute has brought me, it's magical!"* adds Brian Lenormand, his follow student in Master MIAGE at University Paris-Sud. *"This course acted as a stepping-stone: I then integrated a school I never believed would be possible and I love it!"* says Terrence Tran, currently in second year at Mines ParisTech. All three graduated, in June 2017, with a Bachelor in Sciences and Technologies run by the Institute Villebon – Georges Carpak. These students highlight the initial purpose of the Institute: promote equal opportunity and diversify the profiles of graduates with 5-year degrees.

Since 2013 the Institute absorbs in the Bachelor programme about forty students holding a Baccalaureate which is in general studies or technological. Their educational pathways have not always been smooth and they are often from weaker social classes (70 % have a state scholarship). *"Selection for entry is not based on marks but on the students' motivation, their interest in science and mutual assistance"* insists Benedicte Humbert, Head of the Institute. *"The course, which is interdisciplinary, stands out with its innovative teaching approach. It is based on learning through a project and experimental process, on developing transversal skills such as the capacity to resolve a problem, communicate and work in a team. It increases self-confidence and develops creativity, the desire to learn and undertake"*, adds Bénédicte Humbert. Close to businesses, it also offers students sponsorships to mature their professional project.

It is a recipe that works, as the Bachelor has remarkable results: last year 74 % of the students graduated and 94 % continued their studies. *"Today the Institute has also become a test laboratory of new teaching approaches: the most promising will be used in other courses dispensed in the University Paris-Saclay"* concludes Bénédicte Humbert.

http://www.villebon-charpak.fr/

* École normale supérieure Paris-Saclay / Fondation Paris- Tech / ParisTech / University Évry Val-d'Essonne / University Paris Descartes / University Paris-Saclay / University Paris-Sud.

Keywords
Climate change – Climate sceptics – Musical comedy – VivaTech

Title

Hard times for climate sceptics!

© Crescendo H2020

When a laboratory supports a class of secondary school students in the conception of an ambitious musical comedy based on climate changes, everyone applauds.

The Laboratory for Climate and Environment Sciences (LSCE) of University Paris-Saclay is a joint research centre between the CEA, the CNRS and the University of Versailles Saint-Quentin-en-Yvelines. It counts 300 researchers including those working on the European project 'Crescendo' which aims to improve climate models.

As the project H2020 plans awareness-raising measures to climate change, with and for youngsters, the laboratory cooperated with the high school Jeannine-Manuel in Paris. *"My colleague Yves Balakanski, researcher at LSCE, and I, presented to the secondary school students, the issues of climate changes"* says Nada Caud, in charge of communication projects in the laboratory *"as well as the different means of communication on this topic"*. Twelve students subsequently decided to … stage a musical!

Students set sail to 2100

From the musical composition to writing lyrics, the students took over the project, in English, as it is an integral part of the education provided by the school. *"The students divided the tasks: some composed, others wrote the texts, some managed the project and the remaining ones oversaw the scientific content"*, specifies Nada Caud. The story is about a young American who comes from a family that is climate sceptic. She is torn between her comfortable life and the need to change things, as they are having a negative impact on climate change. *"I must face these adult problems*, her introductory song explains, *and it is as much a fact that the ocean is blue as they are not my problems to solve…"* A journey into the future, in 2100, will change her life and incite her to revise her opinion.

Students marked for life

November 8th 2016 is an important date for the project: the day after its presentation to the high school, while the students are already questioning themselves about the subject, Donald trump, a convinced climate sceptic, wins the American election. In June 2017, it is the accomplishment: the musical comedy 2100* is revealed to the school. In September, the students formally present their show, which lasts almost thirty minutes, at the ENS, before an audience of European Crescendo researchers. *"It was an exemplary project in terms of student commitment"*, says Nada Caud. *"They worked hard in their free time!"* The show did not only leave a lasting impression on those who attended – Asher Minns, current Head of the Tyndall Centre for Climate Change Research, tweeted his enthusiasm throughout the show – it also energised those who created it. Nada Caud has received several messages from the students explaining how important this project was to them.

* **https://climatechangewechange.crescendo-project.eu/2018/01/04/2100-the-musical/**

Title

Open TP: experimental physics, just a click away

It is a cheerful and colourful website. It gives you the desire to learn and especially to do! Designed by two teacher-researchers of University Paris-Saclay, Open TP offers the opportunity to young students in physics, to design their own practical work. After addressing several challenges and designing games, the students create their own practical experiences, then analyse the results. This bilingual platform is based on design schools or FabLabs in order to encourage creativity and teamwork. The most difficult task is choosing between the various subjects, such as building an oscillator with, for example, LEGO®, or measuring the power of a kettle. The platform enables personal tutorials to be shared with other users. Fun, educational and participative, Open TP has clearly been aptly named.

https://opentp.fr/

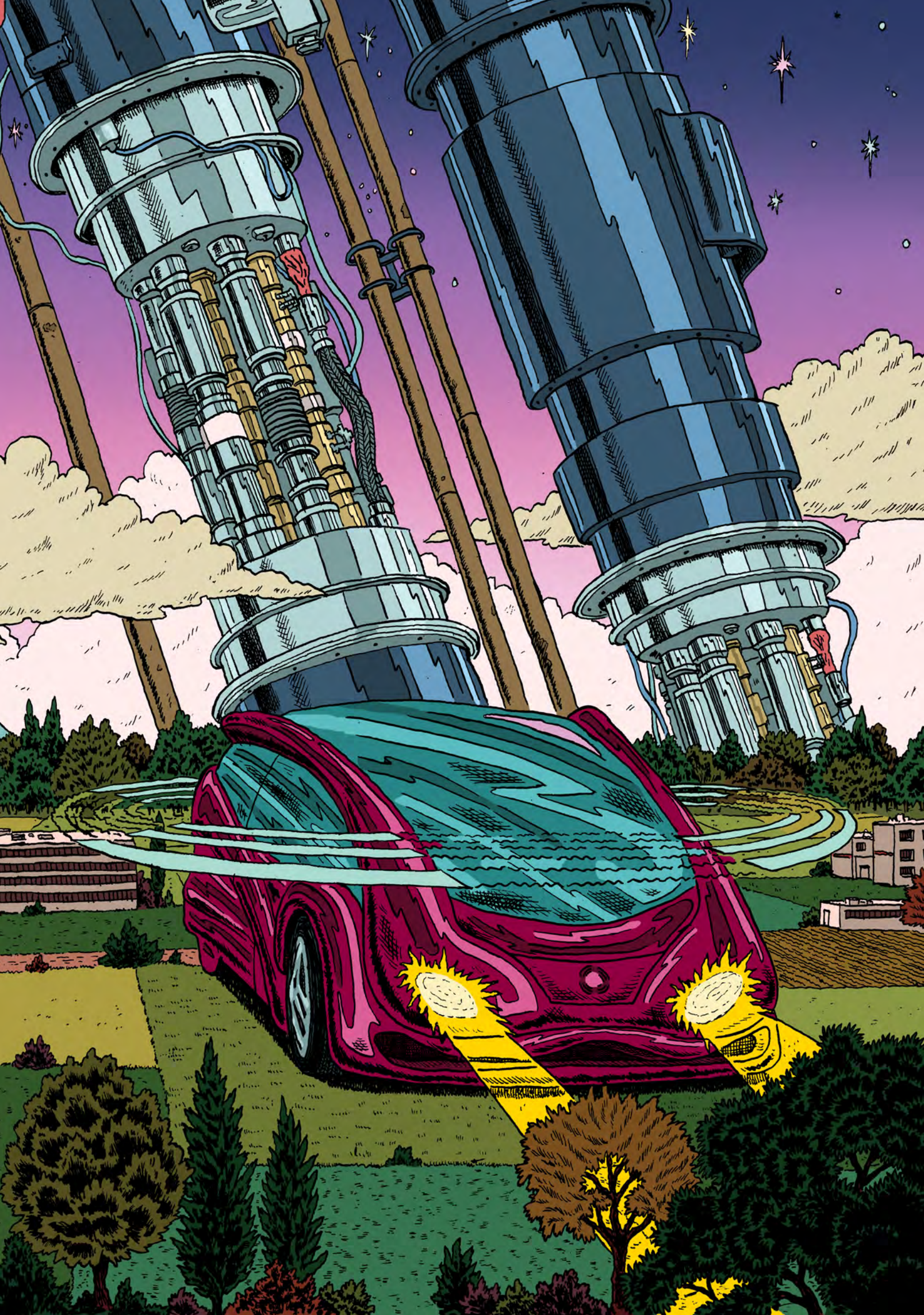
Title

VivaTech 2018: the Paris-Saclay start-up show room

The exhibition was held from May 24th to 26th at Porte de Versailles, Paris. Its preamble took place on May 23rd at the Paris-Saclay Spring, a meeting of innovation on the urban campus CentraleSupélec. There were start-up pitches planned, BtoB meetings, conferences and Keynotes. There were no less than 15 start-ups of University Paris-Saclay present at the VivaTech 2018, amongst which were CocoPlant and its environmentally friendly aquariums, Bob, the most compact and rapid dishwasher in the world and Oledcomm and its lamps that transmit wifi by light.

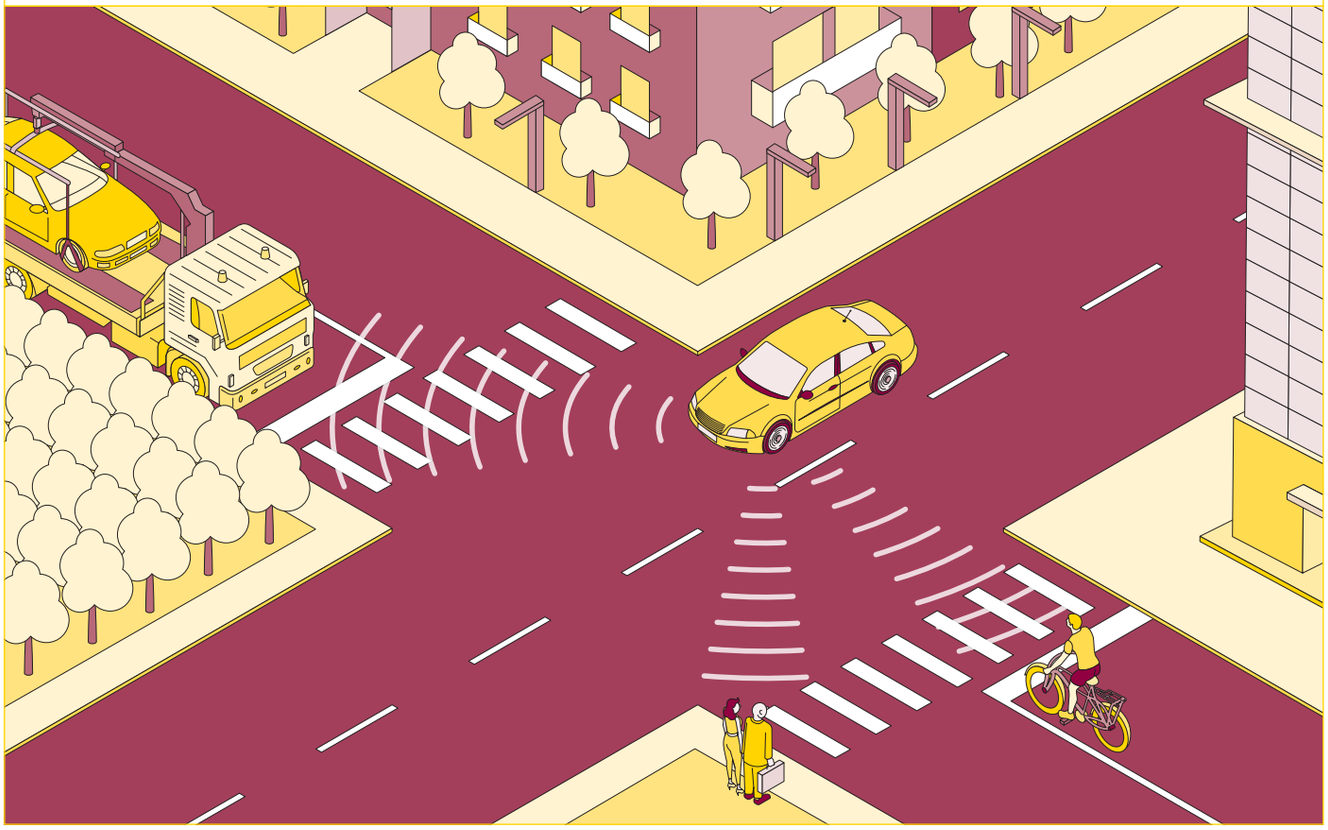
https://vivatechnology.com/

Illustrations on the right page and page 18: **Djilian Deroche**



Title

When urban mobility pursues a chosen path



Reduced pollution, fluid circulation, comfort and increased security… Social, environmental and technical characteristics model twenty-first century urban transport. At University Paris-Saclay researchers imagine, for different industrial partners, new forms of agile, sustainable and shared mobility.

The ecosystem is a major issue for automotive manufacturers and the future star of the city 2.0 will be the self-transport vehicle. It is the subject of considerable research and is covered in sensors, capable of analysing the environment in real time, adapting to it and interacting with humans, cars and bicycles that share the same urban space. *"Data, algorithms and automisation: the industry designing the connected vehicle is confident we are offering good solutions. We are in partnership with Peugeot, the RATP, Renault and Valeo"* summarises Philippe Watteau, director of the Laboratory integration of systems and technologies (List), CEA institute, state-of-the-art in scientific fields.

Fitting in with the traffic

This latest newcomer will need to prove that it is safe and reliable. Cybersecurity cannot be neglected. *"The 'List' is developing formal analysis methods which will mathematically prove that the embedded software is performing in compliance with safety requirements established by the manufacturer. They will provide protection against intrusions seeking to exploit vulnerabilities in the programme."* Start-ups and University Paris-Saclay researchers are both addressing this challenge. Scientists and Bureau Veritas are also working on the certification referential of the vehicles of the future.

Today we can see the technical achievement of the self-transport vehicle everywhere. A shuttle bus without a driver carries CEA personnel. In the neighbouring IRT SystemX, researchers are carrying out tests on several self-transport vehicles. At the test centre of the RATP, the teams from the 'List' put on a surprising "intelligent garage" demonstration with no GPS. They fitted a bus with a localisation system using stereoscopic cameras coupled with an embedded, autonomous navigation controller: the bus can park itself in the warehouse without a driver once the daily rounds are finished. This is accomplished accurately down to the centimetre and perfectly safely.

Daring to open new paths of action

However perfect they are, algorithms are not the only paths to innovation! *"Mobility needs to be considered globally if we want to provide an appropriate direction for everyone"*, explains Dominique Barth, Head of the laboratory Data, Algorithms, Intelligent and Sustainable City (David) at University Versailles-Saint-Quentin-en-Yvelines. *"Traffic flow, economic statistics, health, quality of life and users' testimonies need to be taken into account when analysing the mobility requirements of the inhabitants of a region. Our research on mobility is based on all this data and our projects implicate laboratories of varied fields."* The data enables the establishment of a diagnosis on the congestion of a road network or to design a solution on several levels: a new itinerary for a bus line, an application giving real-time traffic indications or a decision to invest in territorial development. *"A certain amount of 'virtual' information can be added to the real data that is provided by the city's 'numerical twin', a mathematical model that replicates the transport infrastructure"*. This abstract and global representation analyses

the dynamics of the network and the users' behaviour. Shared car services, free bikes, a bus line with a new itinerary: modelling allows the simulation of the impact of a decision or a new offer before trying the approach in the city and this down to the last kilometre.

Co-piloting multidisciplinary projects

Before reaching its destination, research needs to be conducted in a great number of fields. It involves mechanical and IT engineering as well as economic and social sciences. *"We need to anticipate the different usages of self-transport vehicles. They could be shared or have single owners, be rented out directly or by private agencies, anything is possible!"* says Jakob Puchinger, Chairholder of Anthroplois, run by IRT SystemX and CentraleSupélec. *"The consequences of these choices will influence the quality of the traffic circulation, noise and pollution but also, equal access to public transport"*.

> **"Traffic flow, economic statistics, health, quality of life and users' testimonies need to be taken into account when analysing the mobility requirements of the inhabitants of a region."**
>
> **Dominique Barth**

In order to come to a decision, researchers imagine different scripts taking into account, as much technical criteria, as social and environmental aspects. Urban space needs to be shaped to enable different means of transport to cohabit while still allowing humans to live. *"At Paris-Saclay we are fortunate enough to have complementary skills that are necessary for this research and we can therefore consider all angles"*, adds Dominique Barth. *"We are very careful as our work also impacts our quality of life!"*

www.chaire-anthropolis.fr
www.david.uvsq.fr
www-list.cea.fr

Publications

· G. Hiermann *et al. The Electric Fleet Size and Mix Vehicle Routing Problem with Time Windows and Recharging Stations.* European Journal of Operational Research, vol. 252, 2016.

· A. Houissa *et al. A learning algorithm to minimize the expectation time of finding a parking place in urban area.* ISCC 2017.

Story

Jakob Puchinger

© Gil Lefauconnier, IRT SystemX

Île-de-France territory is one of the most interesting in terms of urban mobility as there is a great variety and density of transport. The dynamic of Saclay plateau encourages collaboration between the different academic and industrial partners.

After earning his doctorate, in 2006, in Austria, then a post-doctorate at the University of Melbourne, Jakob Puchinger spent eight years at the Technological Institute of Vienna. For two years he was head of the team of researchers that dedicated their work to transport and logistics.
This IT and optimisation expert came to work at IRT SystemX and CentraleSupélec in 2015. He moderates the Anthopolis chair that is cofinanced by Alstom, Engie, RATP, Renault and the SNCF.

» focus

New energies forecasted for 2020

"We have 20 years to develop an economy founded on renewable raw materials!" **explains Damien Prim, coordinator of the Virtual Institute of Catalytic Sciences of Paris-Saclay for sustainable chemistry (ISC2D).** ***"Sustainable chemistry is only possible for bio-fuels with a key technology: the catalyse".*** **The central research field of the hundred of institute's researchers is on improving energy production processes, as defined in the European strategy H2020.**

www.universite-paris-saclay.fr/fr/isc2d

» focus

Priority to rights

"Data guaranties the safety of the self-transport vehicle. Collection, storage and treatment of this information, which is sometimes important, raises questions that we analyse with sociologists, economists and computer scientists", **explains Mélanie Clément-Fontaine, Head of the Laboratory of Business Law and New Technologies (Dante) of University Versailles-Saint Quentin-en-Yvelines. Without a proper regulation policy the city of the future could become unbearable. In order to avoid this, researchers in law converse with builders, insurers and public authorities to define the most appropriate legal framework.**

Publication · M. Clément-Fontaine, *"Self-transport vehicles in the eye of the cyclone of reforms in robotics, personnel data and civil liability"* in *Les Objets connectés*, Éditions RJIS, 2018.

» focus

Hybridisation moving forward in technologies and ecology

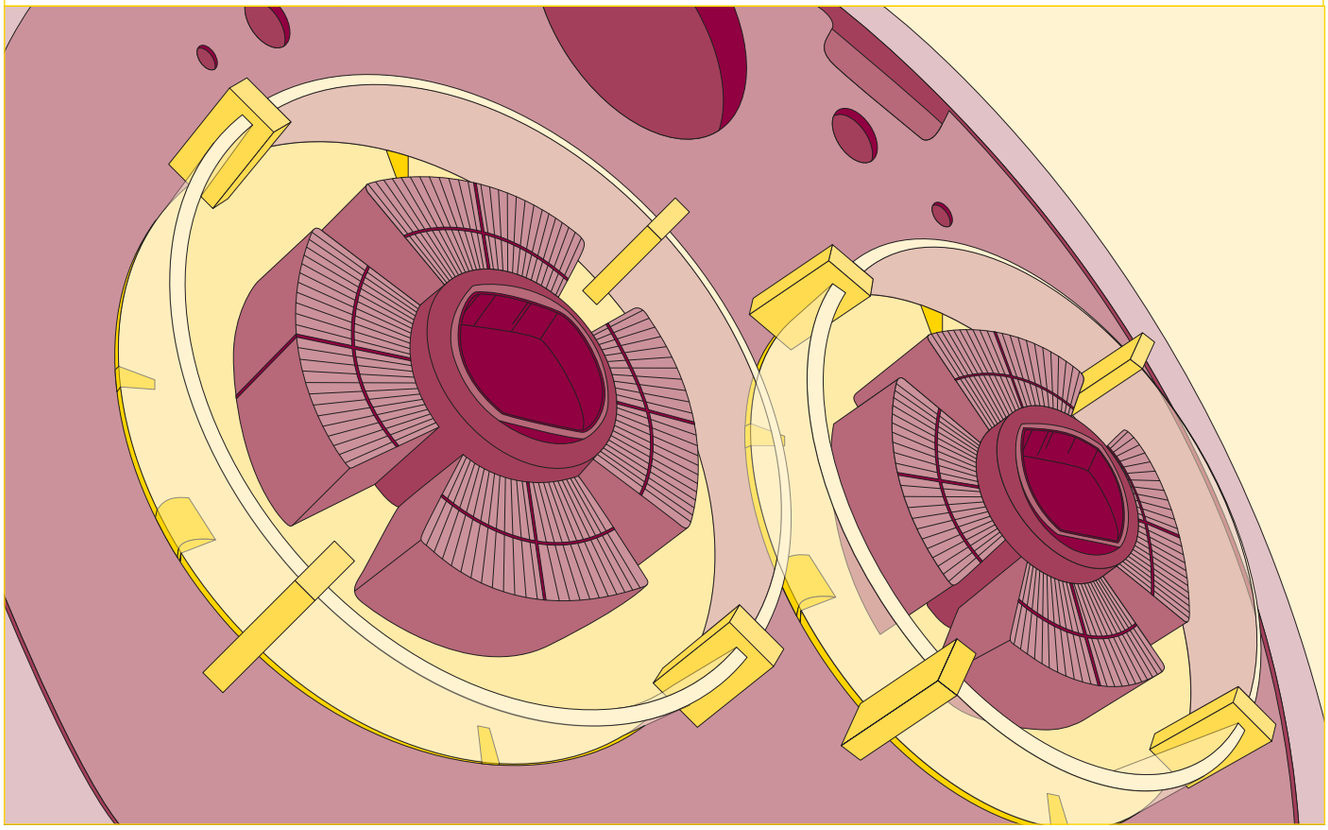
The Armand-Peugeot chair was created in 2011 by the Essec and CentraleSupélec and renewed in 2017 for three years. It examines the economy of electromobility and hybrid technologies. Cofinanced by PSA, its operating budget is one million euros and it promotes ten researchers work, amongst which five are PhD students. ***"Designing a recycling system for batteries, studying the economic model of the self-transport or hybrid vehicle: our research is multidisciplinary and has an industrial and prospective purpose that will contribute to the choices society makes",*** **comments Danielle Attias, Chairwomen.**

Publication · D. Attias (editor). *The Automobile Revolution, towards a New Electro-Mobility Paradigm.* Springer International Publishing, 2017.

Keywords
Physics – Multiscale simulation

Title

When the infinitely small allows you to see full size



Whether it is to understand the physical behaviour of complex materials, biochemical processes or biology inaccessible to experimentation, multiscale simulation takes researchers into the realm of small structures, allowing them to apprehend, and even anticipate their behaviour, on a large scale.

What common points do the service life of a car, the efficiency of a solar panel and a magnetic resonance imaging (MRI) have? All performance will soon be anticipated using a "multiscale simulation". It will enable complex biological and physical phenomena to be represented using mathematical equations and experimental data at different scales: the scale at which the object - a solar panel for example - has been examined with the naked eye (macroscopic scale), or the one with the smallest details taken into account in the simulation within the material (microscopic scale), or the intermediate scales, in between, that can affect the object studied (mesoscopic scale).

In media res

"Our superconducting magnets combine these different scales", explains Pierre Manil of University Paris-Saclay (CEA, Research Institute on Fundamental Laws of the Universe). *"They are metallic reels and are several meters long. They consist in a superconducting metallic cable that is several kilometres long and about a centimetre wide. This cable itself consists in millimetric strands that encloses precious superconducting filaments with a diameter of a few tens of micrometres".*

The magnetic properties of these magnets enable the observation of the human brain using a MRI scan or particles' guiding within an accelerator. Intense magnetic fields delivered by new alloys such as niobium-tin could increase precision of medical examinations or the energy of the accelerator. *"The electromagnetic performance of the magnet and the mechanical strength of the niobium-tin operates at a microscopic scale. We analyse the microstructural behaviour in order to come to conclusions on the performance of the magnet"* explains Pierre Manil.

Citius, altius, forties

The CEA teams are constantly trying to improve the magnetic field of superconducting magnets in order to open up new experimental horizons. *"Our next challenge? Combining the current 'multiscale' approach with a 'multiphysical' modelling and thus assess conjointly the mechanical and electromagnetic performances of the magnet"*, adds Pierre Manil.

> **"Our next challenge? Combining the current 'multiscale' approach with a 'multiphysical' modelling."**
>
> **Pierre Manil**

This research faces two challenges: obtaining useful data for mechanical models and developing microscopic models, the speciality of experts in physics of materials. To develop this, investigators come to theorists' aid. This is where Véronique Aubin and her team at the Laboratory of Soil, Structure and Material Mechanics (MSSMAT) of CentraleSupélec take action. As part of the Cocascope* project, they use state-of-the-art techniques such as nano-indentation to examine the superconductor. Thanks to a micrometric sensor

the researchers are able to access the mechanical properties of very small-scale objects.

Minima, maxima

Multiscale simulation scatters well beyond physics. *"For several decades we have used simulations founded on equations to translate plant growth"*, comments Nicolas Guilpart of AgroParisTech. *"These models enable us to predict the biomass that is produced according to meteorological parameters such as solar radiation, the temperature of the air and the humidity of the soil"*. Researchers gather information on the potential yield of a concerned plot in order to assess agricultural practices in given regions. Food safety of a continent can depend on this. Research, carried out by the Convergence Institute, Climate Change and Land Use (CLAND) involves climatologists, agronomists and economists. They aim to provide direction on agricultural land use. It is then possible to create models predicting optimal conditions for new cultures such as soya, a legume rich in protein and seldom grown in our latitudes, and also to anticipate moving agricultural zones according to climatic evolution.

* Cocascope: modelling the behaviour of superconducting cables at various scales to optimise their electric performances (project financed by ANR).

Publications

· D. Makowski *et al.*, *Global agronomy, a new field of research.* A review. Agronomy for sustainable development, vol. 34, 2014.

· P. Manil *et al. A numerical approach for the mechanical analysis of superconducting Rutherford-type cables using bi-metallic description.* IEEE Transactions on Applied Superconductivity, 2017.

Story

Pierre Manil

© Laurence Godart

In cooperation with the CERN, I contribute to designing prototypes of superconducting magnets to increase the energy collision of the LHC, the largest particle accelerator in the world which enabled to confirm the existence of the Higgs boson.

Pierre Manil is an engineer-researcher in mechanics. He runs the Mechanical and Thermal studies bureau of the Research Institute on Fundamental Laws of the Universe (CEA), in charge of the architecture of large physical instruments.

» focus

From photosynthesis to solar captors

Technical solutions to store solar energy still need to be invented. Nature is not limited in such a way with photosynthesis. Plants are real natural captors that convert and accumulate the energy of light. The proteins that compose their photosensitive membrane are organised in a complex way, from the billionth meter to the micrometre and their electrochemical properties evolve over a very short period. *"Multiscale models are particularly adapted to explain these phenomena. They enable us to understand how plants adjust to a source as inconsistent as light"*, explains Bruno Robert from the Institute of Life Sciences Frédéric-Joliot of the CEA Paris-Saclay. In trying to understand the structure of materials, scientists have developed analysis techniques that are unique in the world such as high-resolution microscopy. Research that will enlighten engineers choices when they are developing solar panels.

Publication · J. Ho *et al.*, *Triplet-triplet energy transfer in artificial and natural photosynthetic antennas.* Proceedings of the National Academy of Sciences of the United States of America, vol. 114, 2017.

» focus

Full throttle on turbines in innovative alloys

New materials allow engine manufacturers to increase the performance of developed turbo machines: reducing the mass, increasing the service life or improving the yield. *"The microstructure of the materials, which depends on manufacturing conditions, influences mechanical properties. A multiscale modelling then represents precisely the behaviour. We apply it to 'nickel-base superalloys' in demand in aeronautics"*, explains Serge Kruch of Onera. *"This procedure interests the industry as it can fit critical pieces in new generation motors, such as turbine disks. It anticipates tracking fragile zones and prepares for inspections"*. Manufacturing costs are thus reduced and performances optimised: simulation provides substantial gains on all scales!

Publication · S. Kruch et al. *Approches multi-échelles en champs moyens ou en champs complets appliquées à la modélisation du comportement non linéaire des matériaux métalliques.* Colloque national MECAMAT « Matériaux Numériques », Aussois, 2018.

Title

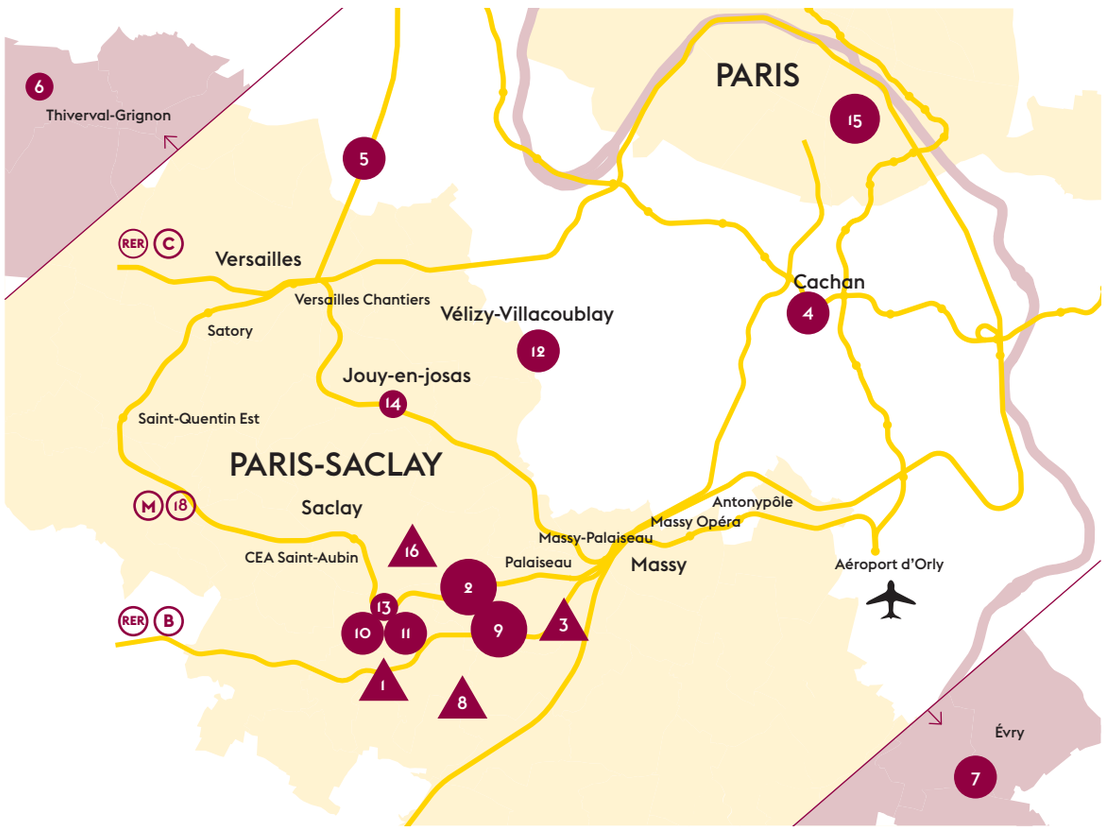
Artificial intelligence

Artificial intelligence is the centre focus, or in support, in numerous laboratories of University Paris-Saclay, whether in fundamental research or technological applications.

NUMBER OF RESEARCHERS IN AI IN THE FACILITY

≥ 11
6-10
≤ 5

STRUCTURING INITIATIVE WITHIN THE DEPARTMENT



1 – CDS
2 – CEA List
3 – Dataia
4 – CMLA / ENS Paris-Saclay
5 – David / UVSQ
6 – GMPA / Agro-ParisTech Inra
7 – Ibisc / Ueve
8 – Icode
9 – Inria Saclay
10 – L2S Centrale-Supelec
11 – Limsi / CNRS
12 – LIS V / UVSQ
13 – Iri / upsud cnrs
14 – Malage / Inra
15 – MIA Paris / AgroParisTech
16 – Saclay IA Platform

210 researchers work on AI at Paris-Saclay

250 students follow a M2 related to the AI subject at University Paris-Saclay, which is a total of 5%.

The DigiCosme LabEx is:

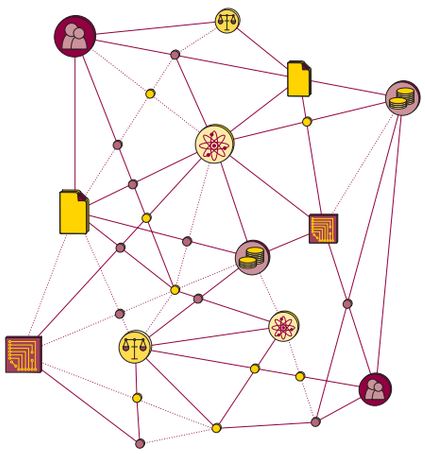
- **3 subjects:** reliability and security, management of networks and science of massive data;
- **3 approaches:** training, research and innovation;
- **11 member institutions:** CEA, CNRS, CentraleSupélec, École normale supérieure Paris-Saclay, École polytechnique, Ensta ParisTech, Inria, Télécom ParisTech, Télécom SudParis, University Paris-Sud, University of Versailles-Saint-Quentin-en-Yvelines;
- **340 researchers;**
- **300 PhD students.**

https://digicosme.lri.fr/tiki-index.php

DATAIA: Converge and influence

The Convergence Institute DATAIA was created in November 2017 and its purpose is to support and develop fundamental research on all aspects of artificial intelligence, whether it is scientific, technological, judicial, economic or ethical. It is a bridge between human sciences and digital revolution. The institute accomplishes this by bringing together researchers from Universities Paris-Sud, Versailles-Saint-Quentin-en-Yvelines and Évry Val-d'Essonne, research institutions such as the CEA, the CNRS, the Inra, the Inria and prestigious universities (CentraleSupélec, l'École polytechnique, l'ENSAE, HEC, l'Institut Mines-Télécom). *"The aim is to both encourage interdisciplinary collaboration thanks to unifying actions such as calls for projects and to give visibility through the organisation of international events"*, explains Florent Staley, the deputy director of research of University Paris-Saclay. The institute also aims to help schools and universities to develop courses on artificial intelligence and make them known to French and international students.

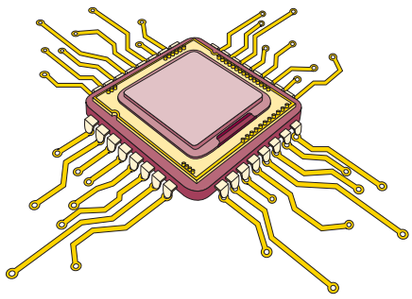
www.dataia.eu



Artificial neurons to learn

At the Laboratory integration of systems and technologies (List), the laboratory of CEA Paris-Saclay dedicated to intelligent digital systems, an idea gained ground: neuromorphic architecture. The aim? To design processors that will directly represent the artificial neural networks on which artificial intelligence learning rests. A lead to gain power!

www-list.cea.fr



Convergence gives work

How can you make recommendations to someone who has not yet ordered? This is one of the questions that the team 'TAckling the Underspecified' (Tau) is working on within the Inria. One of the scopes of application is matching a CV with job offers and how to offer one according to the other on recruitment websites.

www.inria.fr/equipes/tau

At the crossroads of the weight of data and the shock of pictures

Frederic Pascal and his team's ambition at the Laboratory of Signals and Systems (L2S) of CentraleSupélec and of the University Paris-Sud, is to process images and data, to extract knowledge. This is how the monitoring of natural catastrophes was set up with the collaboration of the Cnes (National Centre for Space Research), thanks to an autonomous treatment of radar and optic images, taken by satellites.

www.l2s.centralesupelec.fr/signaux/accueil

Lab & Factory

The Saclay-AI project, financed by the region Ile-de France within the SESAME project framework, aims to make accessible to all – students, researchers or the industry – a pool of resources that are material or software adapted to artificial intelligence algorithms. The equipment, which should be accessible at the end of 2018 will take the form of two platforms: one for basic research (Lab-IA), which will be capable of adjustment and of absorbing peaks of activity in the event of international challenges, hackathons or training courses; the other for technological transfer (Factory-IA), which will be open to the industry and offer, in particular to small and medium sized companies, effective solutions, stabilised services for storage and secure access to data and to computing environments. Joint governance and close interaction between the concerned teams will enable Factory-IA to benefit from Lab-IA results and to maintain its technologies at the highest level.

www.iledefrance.fr/sites/default/files/mariane/RAPCP2017-587RAP.pdf

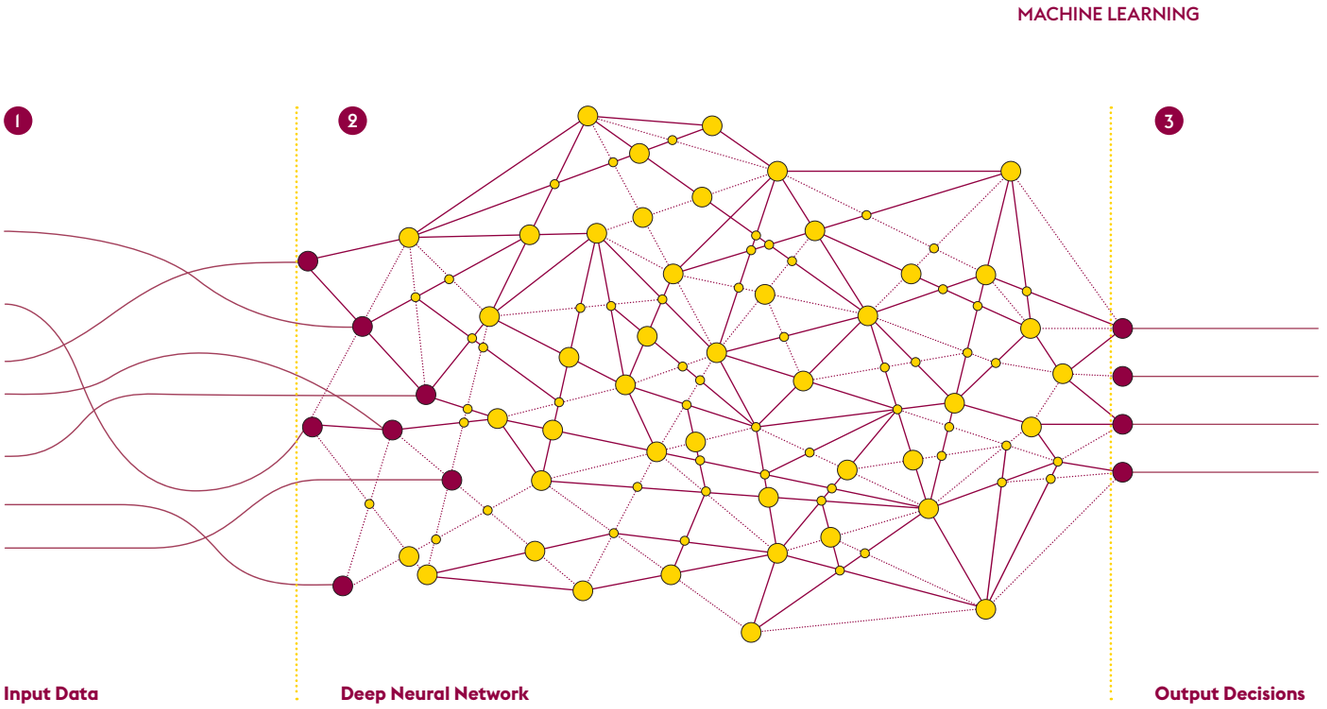
Principal strengths of University Paris-Saclay in terms of AI:

– Vision and patterns recognition (this includes medical and brain imaging applications, audiovisual data applications)
– Automatic language processing
– Machine learning (in particular optimisation and statistics)
– Human-agent interaction (this includes modelling of emotions and interactive visualisation)
– Planning and heuristic research
– Knowledge representation and reasoning models
– Constraint satisfaction and SAT solvers
– Robotics
– Independent agents and multiagent systems
– AI and the web
– Management of decision and doubt

Keywords
Artificial intelligence – Ethics – Robots

Title

From data to decision: applications and implications



New technologies, sciences, transport, energy and public health: using data has become central in many sectors and it leads to important judicial and ethical questions.

"Vast quantities of data are used everywhere today" explains Balazs Kégl, who pilots the Centre for Data Science (CDS) of the University Paris-Saclay. *"And the use is not limited to one field in particular"*. At the heart of the CDS is the proof of this, as researchers perfect machine learning algorithms so that computers can learn to process data coming from fields such as health, law and economy… there are no sectorial restrictions in artificial intelligence!

Tracking propagation of virus

Nicolas Vayatis' work, a member of the research group Machine learning and massive data analysis (MLMDA), of the Ecole normale supérieure Paris-Saclay, involves for example, quantification of human behaviour: captors are placed during a clinical consultation and they record the posture and movements of the subject in order to assess his well-being and mobility. These are indicators of the evolution of the disease. *"This technology opens the way for preventive measures in the medical field. Monitoring a certain number of physiological markers will enable us to predict potential risk incurred by the subject"*, illustrates the researcher. Nicolas Vayatis is also interested in surveillance of systems in, for example, transport or the energy sector, but also in propagation on networks.
"There are three types of applications", he adds, "The first concerns public health where, what will spread, is a virus. The aim is to image the best strategy to fight it. The second pertains to rumours in information networks and aims to determine how to diffuse information and which strategies of control need to be set up. The third, in the transport sector, consists in envisaging a delay or congestion and to avoid it from spreading."

Rendering drones autonomous

Jean-Loup Farges also works in the transport sector, but this time it is aerial and he is Head of the Thematic unit "Artificial intelligence and decision" at the National Office for Aerospace Studies and Research (Onera). *"Currently, drones have navigation autonomy that enables them to get from a point A to a point B"*, explains the researcher. *"We are, however, trying to reach a higher level of autonomy so they are able to determine their navigation themselves, according to general goals, such as observation of a given area"*. Researchers face the problem of reliability of the systems: *"The algorithms concerned are too extensive and cannot be checked over fully. They are created from a generic problem and control of each declination is impossible"*. The method that is being considered today consists in letting the algorithm function and planning a fallback solution in case of failure.

Demystifying robots

This kind of obstacle shows how artificial intelligence does not yet lead to the Holy Grail as can be heard in some speeches. *"Artificial intelligence does not mean autonomous intelligence"*, summarizes Balazs Kégl. Nicolas Vayatis adds: *"People sometimes believe that magical algorithms will be able to predict the future and replace humans. They will, however, only automate part of the process that was previously done manually. They are just bricks that are incorporated into a decisional chain."*

To fight against these claims, Laurence Devilliers, a researcher at the Computer Sciences Laboratory for Mechanics and Engineering Sciences (Limsi) at the CNRS, is studying ethics of artificial intelligence. She

reminds us that robots do not have emotions; they only analyse human emotions and simulate a reaction. This performance is possible thanks to Laurence Devillers' personal work on recognition of human emotions by machines that has been ongoing since 1990. *"In parallel, I have steered my research towards the ethical characteristics of what we are doing"*, underlines the researcher.

> **"Artificial intelligence does not mean autonomous intelligence."**
> **Balázs Kégl**

Anticipating the digital revolution

To forestall problems, Laurence Devillers has taken an interest in 'nudging', an emerging technique that worries about the consumer's behaviour and the possibility of guiding his choices according to cognitive biases. In a test you can see that he will tend to privilege a choice that doesn't require him to tick a box. *"With economists and jurists at Paris-Saclay, we wish to create a communication system that will insidiously influence choices. It will 'nudge' and we will then study the influence we can have on human behaviour"*, reveals Laurence Devillers. *"We wish to understand this tool so that when it arrives in Europe from the United States or Asia, we are able to alert and ask people to take responsibility"*. She then concludes: *"People mustn't be afraid of artificial intelligence but it needs to be understood, explained and taught"*.

Publications

· Boche Adèle *et al.*, *Reconfiguration Control Method for Faulty Actuator on UAV, Advances in Aerospace Guidance, Navigation and Control*, Springer, Cham, 2018.

· M. Tahon, L. Devillers, *Towards a small set of robust acoustic features for emotion recognition: challenges*, IEEE Transaction on Audio, Speech and Language Processing 2016, vol. 24.

· Argyris Kalogeratos *et al.*, Chapter 24: *Information diffusion and rumor spreading, Cooperative and Graph Signal Processing, Principles and Applications*, 1st Edition, 20th June 2018.

Portrait

Laurence Devillers

© LD

> Developing artificial intelligence commercially and ethics are not incompatible and this has been put forth by the Villani report. We must continue down this path.

Laurence Devillers is a computer scientist, Professor at Sorbonne University and member of the Computer Sciences laboratory for Mechanics and Engineering Sciences of the CNRS at Paris-Saclay. She started her career working on systems for recognising continuous speech then on the man-machine dialogue and its assessment. She then studied recognition of human emotions by machines and ethical characteristics specific to this research.

» focus

The CDS: Artificial Intelligence for everyone

The Centre for Data Science (CDS) has been working on extracting knowledge from data since 2014. It can be achieved through very serious games! Balazs Kégl and his team actually organise challenges that they call RAMPs (Rapid Analytics and Model Prototyping) around questions that scientists of all horizons are working on (recognising 400 classes of pollinating insects, identifying craters on Mars or detecting patients who suffer from autism and the others using brain imaging...). The CDS is original because of the organisation of the RAMPs: they are collaborative, as everyone disposes of the codes on a collective platform, and competitive, as the best solutions are rewarded at the end of the challenge. This system is open to all and takes place over a few hours or several weeks.

www.datascience-paris-saclay.fr/news/

Publication · Lætitia Minh Maï Le *et al.*, *Optimization of classification and regression analysis of four monoclonal antibodies from Raman spectra using collaborative machine learning approach*. Talanta, Volume 184, 2018.

» focus

Paris-Saclay mobilised for the Villani report

Many researchers of University Paris-Saclay were interviewed in the preparation of the report "Giving a sense to artificial intelligence" presented to the government by the mathematician Cédric Villani last March. The report recommends that three times more people are trained in artificial intelligence in the next three years. University Paris-Saclay is up for the challenge. Marc Schoenauer, a trained mathematician and head of the Tackling the Unspecified team (Tau/Inria) was one of the six members who were part of the government's mission. *"I am particularly satisfied with the ethical content of the report as it is vital if we wish society to accept artificial intelligence"*.

Publication · www.ladocumentationfrancaise.fr/rapports-publics/184000159/index.shtml

» focus

For new ethics in research

Paola Tubaro, an economist converted to sociologist, is in charge of research at the Laboratory in Computer Science (LRI – CNRS / Université Paris-Sud), at Paris-Saclay. This interdisciplinary position aims to promote exchange between computer science and social science. *"It is essential to protect people's private lives with strict rules"*, she reminds us. *"But these rules must be clear and be distinct for public research that enlightens deciders, legislators and the population in general, from private research carried out by the Gafa (Google, Amazon, Facebook, Apple), that are only serving their own interests. We must not be tempted to assimilate the two and, because we are wary of the second group, to penalise the first group"*.

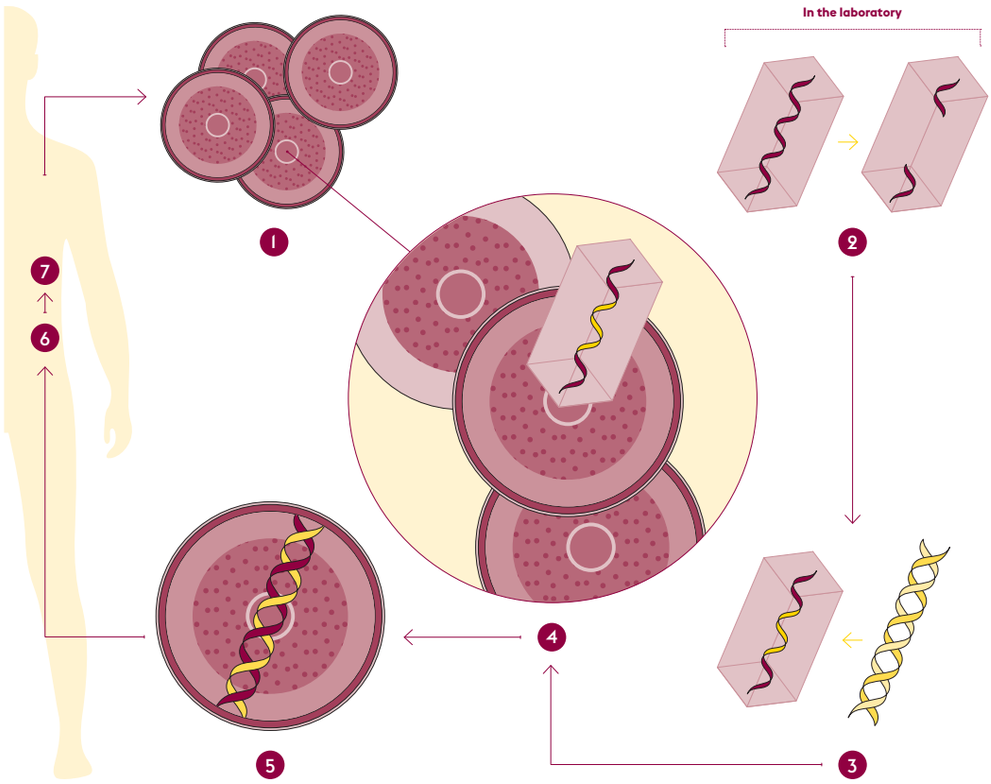
www.databigandsmall.com

Publication · www.theconversation.com/il-faut-repenser-lethique-de-la-recherche-des-reseaux-sociaux-85433

Keywords
Genetics – Enzyme – Brain

Title

Gene therapies: A new way forward



GENE THERAPY: MODUS OPERANDI

1– Cells needing treatment are taken from the patient.

2– The retrovirus is modified to render it inoffensive and part of the genome is eliminated.

3– A functional human gene (in the form of RNA) is inserted in the viral genome.

4– The modified retrovirus is put in contact with the taken samples.

5– The corrector gene provided by the retrovirus integrates the genome of the cells.

6– The cells are injected again into the patient.

7– The cells produce the desired protein.

Gene therapy is the focus of much research and brings the right to hope. Research carried out at University Paris-Saclay is giving very encouraging results in the animal. Some clinical trials on humans are also underway.

Might the development of a treatment against Alzheimer's disease be feasible through gene therapy? This is the path that Nathalie Cartier at the CEA has been following for several years, with positive results. *"The brain's cholesterol could be a therapeutic target for neurodegenerative illnesses, whether they have a genetic origin, such as Huntington disease (a hereditary and orphan disease which results in a neurological degeneration) or not, such as Alzheimer's"* explains the researcher. The cholesterol is actually produced locally and does not cross the blood-brain barrier. It is thus present in great quantity in the brain that contains 25% cholesterol when it represents just 2% of the body weight! The reason is simple: cholesterol is vital to form myelin sheaths which protect the nerve fibres and for the membranes of the neurons. It is a question of dosage: if there is not enough or too much then the signal transmitted by the neurons does not operate correctly. *"There is, therefore, in the brain, a chain that regulates cholesterol and it depends in particular on an enzyme named CYP46A1. It transforms excessive cholesterol that can then be evacuated by the rest of the body"*, explains Nathalie Cartier. *"This enzyme is however absent in the brain of patients who are suffering from Alzheimer's or Huntington disease, and the result is an abnormal cholesterol metabolism".*

Mice… and men against Huntington

Researchers therefore asked an apparently simple question: will providing the brain with this enzyme affect symptoms? The answer is yes! In any case this works on mice. *"Gene therapy consists in giving a coding gene for this enzyme through a small, non-toxic virus (AAV) injected in the brain of Alzheimer's and Huntington diseases' mice models. Their clinical signs have greatly improved"*, reveals Nathalie Cartier.

Nathalie Cartier's team has decided to offer a first therapeutic trial to patients suffering from Huntington's disease, where the area in the brain that requires treatment is smaller. If the result is positive it will open up the way for trials in different conditions. *"Diffusion tests of the product and toxicity, essential before treating patients, have been carried out on primates and worked well. We are now producing a drug vector, at a clinical grade, thanks to the start-up BrainVectis which has been created specifically for this"*, says the researcher. *"In parallel, we are preparing for the clinical trial with the French Brain and Spinal Cord Institute (ICM) team, where the test will take place."* It will hopefully start in 2020.

Resistant antisenses in the body

Providing a new treatment to patients is also the aim of Luis Garcia and his team of the Inserm unit END-ICAP, at the University of Versailles Saint-Quentin-en-Yvelines. They are developing gene therapies for several progressive genetic diseases that affect the muscles (Duchenne muscular dystrophy, Spinal amyotrophy and Pompe disease). *"Our approach is different to usual gene therapies as we do not aim to repair the protein by direct access to the gene but through a messenger RNA, a stage between the gene and the protein"*, reveals Luis Garcia.

To accomplish this the team is working on perfecting antisenses: small nucleic acid analogues (the core of DNA and RNA) are created chemically so they will resist several hours, days or weeks to natural breakdown

in the body and so that they have the time to reach their target and repair the messenger RNA, while it is being produced. *"This method is easier than targeting the gene directly but implies renewing the treatment at a frequency that will depend on which gene is aimed, the life-span of the protein or even the quantity of protein necessary to allow for improvement"*, explains the researcher.

From tests on non-human primates to clinical tests on men.

And it works! The team is now working on developing a new generation of molecules that will be effective in a preclinical phase. They hope to bring them to a clinical phase on the three illnesses in the next few years. In the mice modelling the Duchenne muscular dystrophy, on human blood and in non-human primates, the tests have been successful. Analysis of the final samples should give the go-ahead to start the clinical study. *"This study will be carried out on the Duchenne muscular dystrophy, but the same strategy will apply to the other indications, even if the drug and the targeted gene are not the same"*, announces Luis Garcia.

> **"We do not aim to repair the protein by direct access to the gene but through a messenger RNA, a stage between the gene and the protein."**
>
> **Luis Garcia**

Mass production of antisenses will become feasible as patient associations that support research have created start-ups to enable the clinical trials… positive results should attract partners in the industry and enable commercialisation.

Publication

· A. Goyenvalle *et al.*, *Functional correction in mouse models of muscular dystrophy using exon-skipping tricyclo-DNA oligomers*, Nature Medecine 21, 2015.

Story

Nathalie Cartier

> The same approach can be used to treat rare genetic illnesses but also more frequent diseases such as Alzheimer's.

Nathalie Cartier is a trained paediatrician and she is Head of research at the Inserm where she runs a gene therapy group. Her research on leukodystrophy, that is ongoing since 1990, came to fruition in 2009 with the first clinical trial to treat adrenoleukodystrophy with the HIV virus. This research opened the way to other tests on other illnesses and amongst others, Alzheimer's.

» focus

When the patients turn to science

Thirty years ago, a patient association created Généthon. The laboratory worked initially on genome sequencing but then moved on to develop gene therapies for rare diseases, in particular neuromuscular ones. ***"Research is carried out in the Integrare joint research unit"***, specifies Anne Galy, Head of the unit. ***"We study blood, immune system, liver and muscles diseases and develop gene therapy systems adapted to treat these illnesses"***. Généthon uses CRISPR tools to generate new models of rare illnesses. It develops new therapeutic platforms, including delivery of enzymes into the liver (reference below). This approach led to a new clinical trial for gene therapy for Crigler Najjar disease. Généthon is also the source of preclinical studies on myopathy that resulted in trials on young children. The results are very encouraging and have exceeded expectations. Généthon is also developing international clinical trials with lentiviral vectors. Wiskott Aldrich syndrome and granulomatosis show long lasting biological results and patients who have received treatment show significant clinical benefit.

http://www.genethon.fr/

Publication · Puzzo F. et al., *Rescue of Pompe disease in mice by AAV-mediated liver delivery of secretable acid α-glucosidase*, Sci Transl Med. 2017

» focus

Hope against beta-thalassemia

LentiGlobin: This is the name of the lentiviral vector produced under the leadership of Philippe Leboulch at the University of Harvard and the CEA Paris-Saclay. It represents hope to the 288 000 patients suffering from beta-thalassemia over the world. This genetic illness affects the production of the hemoglobin beta chain and causes more or less severe anaemia that can result in monthly transfusions. Two clinical phase I-II trials have shown that with a healthy version of the affected gene, obtained with LentiGlobin, it is possible, depending on the patient's genotype, to cease transfusions or at least to reduce the volume of them by 73 % and to decrease the frequency. ***"Phase III clinical trials are now ongoing on several continents before requesting drug marketing approval for this biological drug"***, Philippe Leboulch adds.

Publication · Alexis A. et al., *Gene Therapy in Patients with Transfusion-Dependent β-Thalassemia*. N Engl J Med 2018.

www.cea.fr/presse/Pages/actualites-communiques/sante-sciences-du-vivant/succes-therapie-genique-thalassemie-2018.aspx

SEEN FROM ABROAD

Seen from

Sergey Karpov

« I have been really lucky to work with some excellent and world reknown molecular biologists at UPSaclay. The combination of this kind of dynamic collaboration and the state-of-the-art lab facilities have really helped me focus on important questions left unanswered by some of my previous research. »

Professor Sergey Karpov studies the evolutionary ancestry of certain types of fungi that could impact freshwater reservoirs and biofuels in the Invertebrate Zoology Department at Saint Petersburg State University and Zoological Institute of Russian Academy of Sciences in Russia. As a participant in the Jean d'Alembert Fellowship Programme, he spent six months at the lab "Ecologie systematique evolution (ESE)" (AgroParisTech / CNRS / Université Paris-Sud).

www.zoology.bio.spbu.ru/Eng/index.php
www.ese.u-psud.fr/?lang=en

Journal

THE WORLD UNIVERSITY RANKINGS

Title

FRENCH RESEARCHERS SPOTLIGHT BENEFITS OF "LEARNING BY DOING"

A French university has shown that physics students are far more engaged when they can conduct experiments themselves and in teams.

Researchers from the University of Paris-Saclay carried out tests at Paris-Sud University and the Institut Villebon-Georges Charpak, which both specialise in science and technology. After being given low-cost tools such as Lego and taking part in a series of games and challenges, students worked in groups to conduct their own experiments in ways that simulated laboratory conditions.

www.timeshighereducation.com/news/french-researchers-spotlight-benefits-learning-doing

Journal

GLOBAL BANKING & Finance review

Title

NEW APP FOR PHD STUDENTS REVEALS WHAT LIFE AFTER GRADUATION IS REALLY LIKE

Université Paris-Saclay's new survey app provides fresh insight into PhD graduate employment rates, locations, and salaries after leaving.

www.globalbankingandfinance.com/new-app-for-phd-students-reveals-what-life-after-graduation-is-really-like/

Journal

Channel EYE

Title

EU FORMS AN AI PANEL

The EU is forming a panel to work out what needs to done on AI.

Nozha Boujemaa, director of the Data and AI institute of Université Paris-Saclay (DATAIA), has been nominated to the High-Level Expert Group on Artificial Intelligence (AI HLG).

The group's objective is to support the implementation of the European strategy on AI.

www.channeleye.co.uk/eu-forms-an-ai-panel/

Journal

EDUCATIONDIVE

Title

UNIVERSITÉ PARIS-SACLAY AND MCGILL UNIVERSITY PARTNER TO BOOST INTERNATIONAL SCIENTIFIC EDUCATION AND RESEARCH

Université Paris-Saclay has signed a cooperation agreement with McGill University, the most international university in Canada.

Recognized as one of the world's top research universities – 32nd in QS World Rankings 2018, 2nd in Canada – McGill University also ranks top among Canadian universities for doctoral and medical programmes. The student population, from 150 countries, is the most international of all Canadian universities.

www.educationdive.com/press-release/20180614-universite-paris-saclay-and-mcgill-university-partner-to-boost-internationa/

Journal

fe news.co.uk

Title

UNIVERSITÉ PARIS-SACLAY SET TO TEACH DIGITAL MANUFACTURING TO EXISTING COMPANIES

Université Paris-Saclay has launched a new diploma designed specifically to teach students about digital manufacturing.

The "Fablab Manager" programme will be part of the international FabFoundation network and a local ecosystem, designed to build creativity and innovative practices into existing businesses and start-ups.

www.fenews.co.uk/press-releases/17927-universite-paris-saclay-set-to-teach-digital-manufacturing-to-existing-companies

Keywords
Biology-Pharmacy-Chemistry division – Synergies – One-stop counter

Title

Beginning of new building work for the Biology-Pharmacy-Chemistry division

© Agence BTuA / Groupe-6

April 6th, 2018: This day is a milestone in University Paris-Saclay's history. It corresponds to the signing of the most important public-private partnership contract of the Campus Plan with the project company Platon-Saclay led in particular by Bouygues Construction. *"Through this contract, the State is giving us the necessary budget to design the Biology-Pharmacy-Chemistry division (BPC)"* explains Jean-Michel Lourtioz, Campus, heritage and sustainable development Vice-President of University Paris-Saclay.

The division shall consist in two sites. Near the future underground, the first division will house, in 74,000 m2, the Pharmacy Faculty of University Paris-Sud, the Institute of Molecular and Material Chemistry of Orsay (ICMMO – University Paris-Sud/CNRS) and the biology and chemistry masters. The second will receive the Institute of Diversity, Ecology and Evolution of Living Systems (IDEEV- University Paris-Sud/CNRS/Inra/AgroParis Tech/IRD).

"The previous Pharmacy UFR buildings that date back to the 70s-80s, situated at Châtenay-Malabry (92) were difficult to renovate", Jean-Michel Lourtioz reminds us. The new IDEEV site will also be situated close to agricultural land and this is of major importance to the institute.

The creation of the BPC division will also "*allow the meeting of laboratories spread out on campus so far, thus creating much greater synergies"*, says Jean-Michel Lourtioz. Sylvie Retailleau, President of University Paris-Sud, points out that *"biology, pharmacy and chemistry share common issues and culture on health. This gathering seemed essential to us"*.

The building will start in April 2019 and will be ready to be used for the 2022 university academic year. 3,300 students and 1,300 personnel will then bring the division to life.

© Agence BtuA/Groupe-6

Title

A one-stop counter to house the students

In order to regulate the new available housing offers – 5,500 in total – on the Paris-Saclay plateau, taking into account the students' needs and the divisions' needs, they have been entrusted to one single operator who will act in all administrators' names. As from the university academic year 2018/2019, administration will be run by a single, dematerialised one-stop counter set up by the regional centres of student social services (Crous).

Each student will be able to make three choices to find satisfactory accommodation. The request will then be sent to the faculty to confirm registration in the university. The one-stop counter will then make suggestions and send the request to the administrator to finalise the transaction. This system, more fair, creates a common "Paris-Saclay" identity through an interinstitutional diversity.

https://logement.campus-paris-saclay.fr/

© Baumschlager Eberle Architectes

Title

Italian, American, Greek... A Foodtruck each

Since January 2018, strange trucks have appeared on several sites in the Moulon neighbourhood and around the École Polytechnique. In October 2017, the government urban development corporation issued a call for applicants. As a result, about twenty foodtrucks were selected according to their cuisine and value for money. Today students and personnel can choose between Beny's hot-dogs, Cosmic Carrot'N rolls and falafels or even choose to taste gourmet Italian food thanks to Nolita Street.

Photographs
The Biology-Pharmacy-Chemistry project will be implanted in two strategic places:
• (at the top) the "Metro site", in front of the future Orsay-Gif station of the line 18 of Grand Paris Express and on the main street of the neighbourhood.
• (at the bottom) the "IDEEV site", north of the Moulon plateau, near agricultural land.

WE WERE THERE

JULY

Date	Location	Host
09-14	Toulouse	EuroScience

Description

EUROSCIENCE OPEN FORUM (ESOF) 2018

ESOP is the largest scientific interdisciplinary meeting in Europe. It is dedicated to scientific research and innovation and is a unique setting for interaction and debate with scientists, innovators, deciders, businessmen and the general public.

www.esof.eu/en/

Date	Location	Host
13	Campus of University Paris-Saclay	University Paris-Saclay

Description

FAB14 DISTRIBUTED SCIENCE RESEARCH HOTSPOT DE L'UNIVERSITÉ PARIS-SACLAY

A day of conferences and workshops on the theme 'Science & Research', as part of the annual international meeting of Fab Labs (FAB14+) and the Fab City Summit, which is the international reunion of Fab City.

http://distributed.fab14.org/fab14-science-research-2/

DON'T MISS

SEPTEMBER

Date	Location	Host
3-14	Évry	University of Évry Val-d'Essonne

Description

EXHIBITION AND MURAL« FRAGILITÉS »

The students of the open teaching units, plastic art and mural art, exhibit their creations and humorously and poetically query our vulnerability to the hazards of existence.

www.univ-evry.fr/toute-lactualite/actualites-vie-etudiante/actualites-culture/fragilites-une-exposition-et-une-fresque-murale-a-decouvrir-sur-le-campus.html

Date	Location	Host
19-20	Saint-Quentin-en-Yvelines	University of Versailles-Saint-Quentin-en-Yvelines

Description

YOUNGER'S CUP – INTERNATIONAL TOURNAMENT OF UNIVERSITY GOLF

This student "Ryder Cup" will confront French students and international students

www.uvsq.fr/une-ryder-cup-etudiante-a-l-universite-de-versailles-saint-quentin-en-yvelines-395113.kjsp?RH=VF

OCTOBER

Date	Location	Host
10	Paris	CNRS

Description

CNRS x START-UP

The event will be dedicated to innovative start-ups and to the researcher-entrepreneurs of the CNRS

www.cnrs.fr/fr/evenement/cnrsxstart

Date	Location	Host
15-18	Le Bois-Marie	IHES

Description

WORKSHOP « GOOGLE MATRIX : FUNDAMENTALS, APPLICATIONS AND BEYOND »

This workshop will tackle the fundamental characteristics that determine efficiency and control of the information flow on directed networks and information research.

https://indico.math.cnrs.fr/event/3475/

OCTOBER – NOVEMBER

Date	Location	Host
until the 22nd	Campus of University Paris-Saclay	University Paris-Saclay

Description

"EN VUES" – TRAVELLING PHOTO EXHITIBION

Based on architecture and campus life, the exhibition "En Vues" is comprised of about fifteen photographs.
– 1st-12nd October: University of Versailles Saint-Quentin-En-Yvelines
– 15th-30th October: University Évry Val-d'Essonne
– 8th-22nd November: University Paris-Sud
– Coming soon: ENS Paris-Saclay

www.envues.universite-paris-saclay.fr/

NOVEMBER

Date	Location	Host
14-15	Versailles	INRA

Description

SYMPOSIUM "ISSUES CONCERNING THE SOIL: LONG TERM MEASURES TO REPLY TO BOTH PRESENT AND FUTURE REQUIREMENTS"

Organised by the INRA, AgroParisTech, the LabEx BASC, the French Association of soil survey (AFES) and the National network of scientific and technical expertise of the soils (RNEST-Sols).

www.inra.fr/Chercheurs-etudiants/Evenements/14-15nov2018-Enjeux-sol

Date	Location	Host
20-21	Toulouse	ONERA

Description

THE ONERA SCIENTIFIC DAYS ON DRONES 2018

New applications on drones are multiplying, due to technological and scientific progress, and French and European regulations on the subject are evolving rapidly. Recent activity on drones will be presented during these meetings: vectors, ground stations and also man-system interaction.

www.onera.fr/agenda/jso-drones-2018

DECEMBER

Date	Location	Host
10-13	Nancy	INRA

Description

FUNCTIONAL ECOLOGY CONFERENCE (FEC2018)

The Call for Abstracts to participate in the international conference on functional ecology is open. Researchers, engineers and PhD students are invited to register!

www.nancy.inra.fr/Evenements/FEC-2018-ev

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READ ABOUT

THE CONVERSATION

The Ant war

A comic book of six chapters presents these fascinating little creatures.

• **Franck Courchamp** (Head of Research CNRS, University Paris Sud – University Paris-Saclay)
• **Mathieu Ughetti** (Illustrator-Graphic designer, Teaching DTP, University Paris Nanterre – University Paris Lumières)

www.laguerredesfourmis.com/

Women's football: Seeking emancipation and development

Even if women's football is now reaching maturity, it is still traditionally referred to as a men's sport and this image of a male activity remains strong.

• **Yann Imine** (Associate Professor at the UFR STAPS, University Paris Sud – University Paris-Saclay)

www.theconversation.com/football-feminin-une-pratique-majeure-en-quete-demancipation-98900

IN ISSUE 9

NEW RELEASE
IN JANUARY 2019

Microfluidic
Nanoparticles and biomedical
Quantic Physics
Environmental Health

Have actively contributed to this issue:

• **Danielle Attias** (Chairholder Armand-Peugeot – ESSEC Business school / CentraleSupélec / University PSA) • **Véronique Aubin** (Teacher-researcher at Soil, Structure and Materials, Mechanics Laboratory – CentraleSupélec) • **Yves Balkanski** (Researcher at the Environment and Climate Sciences Laboratory – CEA / CNRS / University of Versailles Saint-Quentin-en-Yvelines) • **Dominique Barth** (Head of the Laboratory of Databases, Algorithms, Intelligent and sustainable City – University of Versailles-Saint-Quentin-en-Yvelines) • **Rami Bechara** (PhD student at the mixed research unit Inflammation, Chemokines, Immunopathology – Inserm / University Paris-Sud) • **Nathalie Cartier** (Head of Research, group Biotherapies at the Molecular Imaging Centre – CEA / Inserm) • **Nada Caud** (Head of Communication Projects at the Environment and Climate Sciences Laboratory – CEA / CNRS / University of Versailles-Saint-Quentin-en-Yvelines) • **Mélanie Clément-Fontaine** (Head of the Business Law and New Technologies Laboratory – University Versailles-Saint-Quentin-en-Yvelines) • **Laurence Devillers** (Researcher at the Sciences Laboratory for Mechanics and Engineering Sciences – CNRS) • **Jean-Loup Farges** (Theme Leader of "Artificial Intelligence and decision" – ONERA) • **Anne Galy** (Head of Research in the mixed unit Integrated Genetic Approaches and New Therapies for Rare Diseases INTEGRARE – Inserm / University of Évry / University Paris-Saclay / École pratique des hautes études) • **Luis Garcia** (Head of Research at the Neuromuscular Handicap Unit: Applied Physiopathology, Biotherapy and Pharmacology - University of Versailles-Saint-Quentin-en-Yvelines) • **Nicolas Guilpart** (University lecturer in agronomy – AgroParisTech) • **Bénédicte Humbert** (Head of the Institute Villebon-Georges Charpak) • **Balázs Kégl** (Pilot of the Centre for Data Science – University Paris-Saclay) • **Serge Kruch** (Research engineer at the ONERA) • **Philippe Leboulch** (Researcher at the Institute François-Jacob – CEA) • **Jean-Michel Lourtioz** (Campus Vice-President, Heritage and Sustainable Development – University Paris-Sud) • **Pierre Manil** (Engineer-Researcher at the Research Institute on Fundamental Laws of the Universe – CEA) • **Frédéric Pascal** (Researcher at the Signals and Systems Laboratory – CentraleSupélec / University Paris-Sud) • **Sylvie Pommier** (Head of the PHD College – University Paris-Saclay) • **Damien Prim** (Coordinator of the Virtual Catalytic Sciences Institute of Paris-Saclay for Sustainable Chemistry – University Paris-Saclay) • **Jakob Puchinger** (Chairholder of Anthropolis – IRT SystemX / CentraleSupélec • **Sylvie Retailleau** (President of University Paris-Sud) • **Bruno Robert** (Head of Research at the Institute of Life Sciences Frédéric-Joliot – CEA) • **Marc Schoenauer** (Head of the TAckling the Underspecified Team – Inria) • **Florent Staley** (Deputy Director of Research – University Paris-Saclay) • **Paola Tubaro** (Researcher at the Laboratory of Research in Computer Sciences – CNRS) • **Nicolas Vayatis** (Member of the Research Unit "Machine learning and massive data analysis" – École normale supérieure Paris-Saclay) • **Philippe Watteau** (Head of the Systems and Technology Integration Laboratory – CEA).

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Thank you and happy reading!

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LABEX SPS

The LabEx Plant Science of Saclay (SPS) seeks to understand plants to meet the challenges of tomorrow in terms of human and animal nutrition, food safety and protection of the environment.

Members: AgroParisTech, CNRS, INRA, University Évry Val-d'Essonne, University Paris-Saclay, University Paris-Sud.

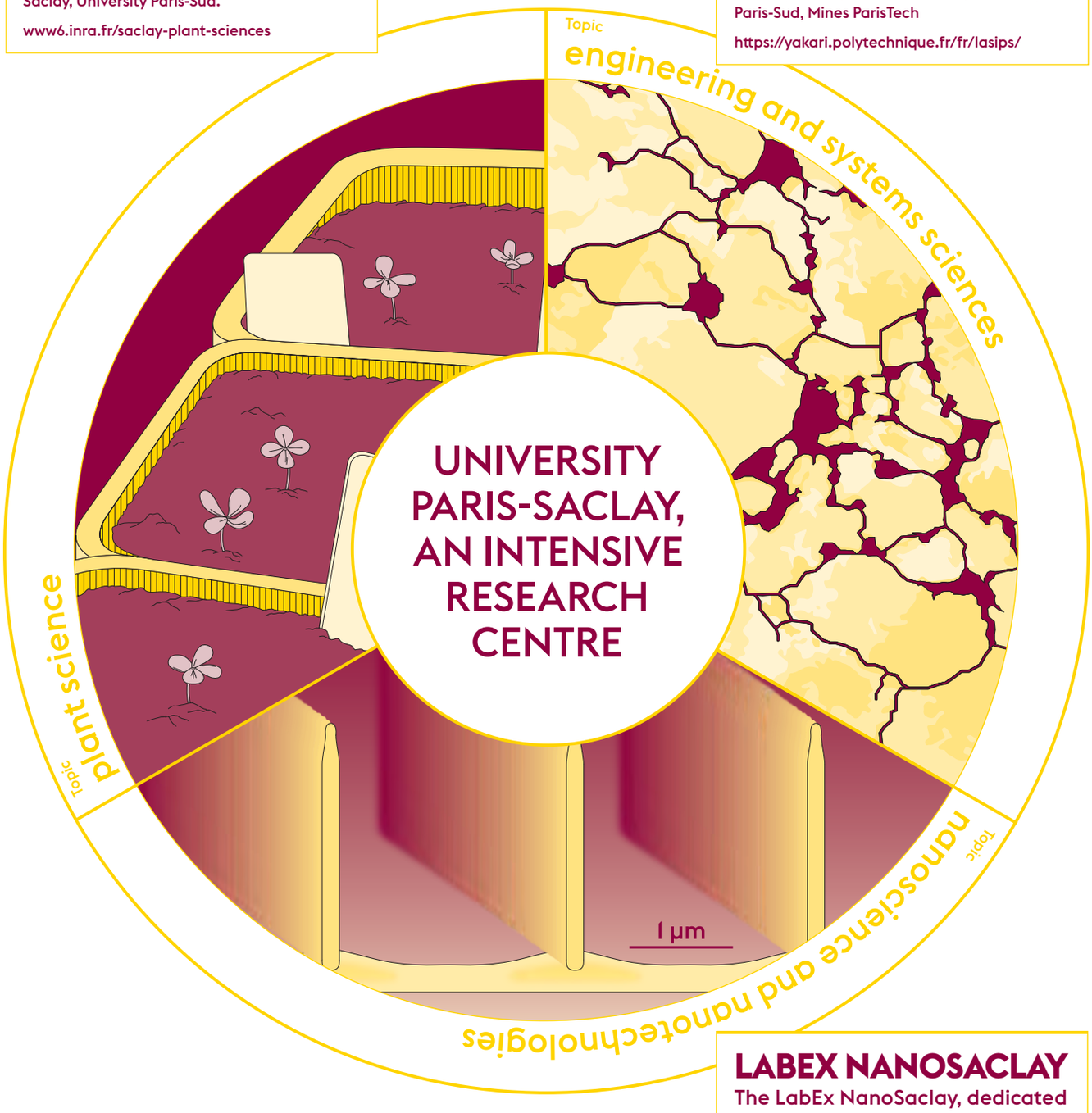
www6.inra.fr/saclay-plant-sciences

LABEX LASIPS

The Systems and Engineering Laboratory of Paris-Saclay (LaSIPS) gives a multidisciplinary vision and a system approach to engineering applied to sustainable development, energy and health.

Members: CEA, CentraleSupélec, CNRS, École normale supérieure Paris-Saclay, École polytechnique, EDF, ENSTA ParisTech, University Paris-Sud, Mines ParisTech

https://yakari.polytechnique.fr/fr/lasips/



LABEX NANOSACLAY

The LabEx NanoSaclay, dedicated to nanoscience and nanotechnology, addresses economic and societal issues in the areas of information processing, health and environment.

Members: CEA, CentraleSupélec, CNRS, École normale supérieure Paris-Saclay, École polytechnique, Optics Institute Graduate School, Onera, Synchrotron Soleil, Thales, University Paris-Sud, University of Versailles-Saint-Quentin-en-Yvelines.

www.nanosaclay.fr

The eleven laboratories of excellence within University Paris-Saclay are the result of the creativity and dynamism of the community of researchers and teacher-researchers who, on a daily basis, contribute to the greatness of the campus and its research.