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HIGHER EDUCATION IN FRANCE AT A GLANCE

A Bit of History

French Higher Education is the result of a long history, created by several ruptures and reforms. The establishment of French universities dates back to the Middle Ages when the first universities rose out of the ecclesiastical schools. During the French Revolution, universities were criticized for their conservatism and dependence on the Church and therefore abolished and replaced by central and specialized colleges such as the *Ecole Polytechnique* or the *Conservatoire National des Arts et Métiers*. The rebirth of universities in France was allowed by Napoleon, who created the Imperial University, a highly centralized institution, which gathered five independent disciplinary-based faculties.

Universities and Grandes Ecoles

France still has two main kinds of Higher Education institutions: Universities and “Grandes Ecoles”.

Areas of Teaching

Universities have the traditional role of offering education across all disciplines. Furthermore, some disciplines are only taught at universities (medicine, law, psychology).

The *Grandes Ecoles* have kept their original vocation of being applied schools. They offer programs in specific areas of teaching, especially in engineering or business administration.

Student Recruitment

Universities: Access to an undergraduate program is granted to all students holding a high school diploma (*baccalauréat*) or equivalent. Once enrolled in the study program, students will be evaluated through a process of high-level assessments, including written and oral examinations, internship reports, theses and individual and group projects.

Grandes Ecoles: Students gain access to *Grandes Ecoles* by passing a national entrance exam (or in some cases international) or an aptitude test according to the number of students the schools are required to accept. In order to prepare for entrance exams, students attend a two-year program of “preparatory classes”.

Universities are therefore much larger and educate a greater number of students than *Grandes Ecoles* which however still enjoy a higher level of prestige as “elite” institutions.

Universities and *Grandes Ecoles* are being integrated within the framework of COMUE (Communities of Universities and Establishments). The two types of institutions offer an increasing number of joint degrees, particularly at the master’s level.

*France still has two main kinds of Higher Education institutions: **Universities** and “**Grandes Ecoles**”.*

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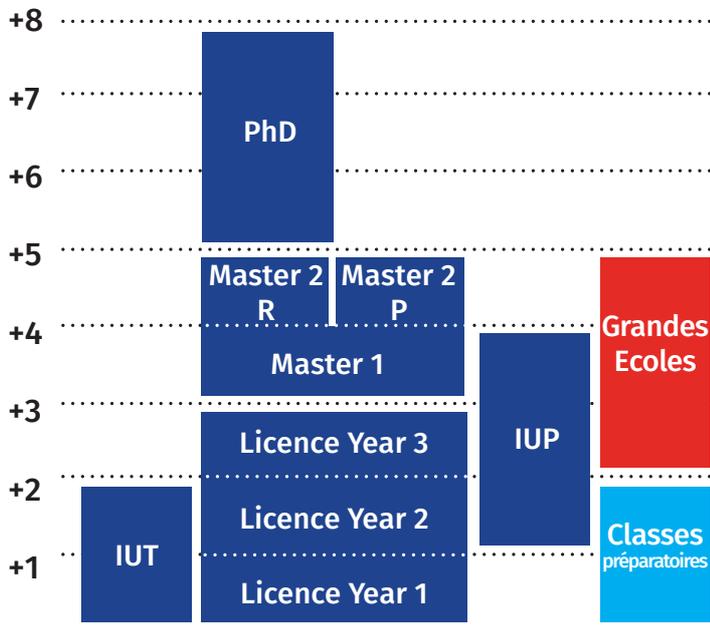
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Structure of degrees in France



- University
- High School
- Grandes Ecoles

Research at Universities

Universities, along with the national organizations (such as CNRS, INSERM or INRIA), are the main players in research in France.

Most French research is undertaken within the frame of joint units called a “UMR” (*Unités Mixtes de Recherche* or Joint Research Units).

A UMR brings together researchers, faculty members, engineers and technicians from several institutions (including universities, schools and national research organizations) to work on a joint scientific theme. UMR’s are the basic building blocks of French public research.



photo credit: MAEDI



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RECENT TRENDS IN THE FRENCH HIGHER EDUCATION LANDSCAPE

European integration through the Bologna Process

Launched in 1999, the “Bologna Process” had 28 participating countries at the time of its conception.

Today, there are 47 countries participating in the construction of a “European Higher Education Area” and an increasing number of “Bologna friendly” universities around the world.

There are 47 countries participating in the construction of a “European Higher Education Area”

In France, the implementation of the Bologna Process introduced a number of changes:

- Implementation of the “LMD system” (“licence, master, doctorat”: Bachelor (3 years), Master’s (2 years), PhD (3 years)). Courses are organized into semesters and “teaching units”.
- Application of the system of cumulative and transferable ECTS credits (European Credit Transfer System). A Bachelor’s degree equals 180 ECTS credits and a Master’s degree 300 ECTS credits. Credits are earned by successfully passing exams, practicums, individual projects (thesis, research project, etc.)
- Modification of the education catalogue of each institution: a general catalogue presented within the framework of the contract agreement between the education institution and the Ministry of Higher Education and integrated into the institution’s project.
- Introduction of the “Diploma Supplement” that describes in detail the knowledge and skills acquired by each student during the course of the education program in order to promote the student’s employability.
- Establishment of Doctoral Schools which offer further education for doctoral students in order to complement the thesis preparation.





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Towards a Greater Autonomy

The “LRU” law (Libertés et Responsabilités des Universités, 2007 – *Liberties and Responsibilities of Universities, 2007*) introduced major reforms to the organization and management of French universities by giving them greater autonomy, in a context where they were asked to develop institutional strategies and profiles in order to enhance their research performance and international attractiveness, as well as the economic and societal impact of their activities.

Main Principles of the LRU Law:

- Orientation and professional integration are explicitly to be managed by universities.
- A new mode of university governance: greater acceptance of external hiring within the Administration Council, reduction in the size of the Administration Council, and strengthening of the power conferred to Presidents of universities, who are responsible for the universities’ strategic plans.
- New hiring procedures for teaching staff, which are to promote mobility.
- Greater responsibility in budget management (implementation of general budgets) and human resources management.
- Possibility for universities to obtain full ownership of heritage real estate upon request.
- Possibility for universities to establish foundations in order to promote intellectual patronage (fiscal incentives for company or individual donors).
- Re-defining the role of the State based on a multi-year contract signed by each university.

Groupings and mergers of Universities

With 75 universities, 230 business schools, and 250 engineering schools, as well as specialized schools in art, architecture, film making, video game development, hotel management, and fashion... the French Higher Education system lacked readability, especially at the international level.

France is currently reshaping its Higher Education landscape towards a more visible and competitive model. To apply for the *Investments for the Future* funding, universities, schools and research organizations have been encouraged to group together to form world-class comprehensive clusters based on regional strengths.



photo credit: Aix Marseille Université

France is currently reshaping its Higher Education landscape towards a more visible and competitive model.

Massive investments

In 2010, the government launched a 35-billion euro investment program called Investments for the Future (PIA) which secured nearly 22 billion euros for Higher Education and Research.

The Investments for the Future program targets innovative investments all over the country. This program aims to promote French excellence in Higher Education and Research, through the funding of basic research, industrial innovation, training, technology transfer, and research maturation.

In 2014, a second stage of the PIA program was launched with a € 12-billion budget. In 2016, a third stage has been announced with a € 10-billion budget (€ 2.9 billion for Higher Education and Research, € 3 billion for technology transfer and € 4.1 billion for innovation and business development).

Among the main initiatives supported by the PIA programs is the IDEX (Excellence Initiative) which supports the emergence of world-class comprehensive universities, the I-Site (support for local smart-specializations), the LABEX (Excellence Labs, supporting high level research centers in strategic areas) or EQUIPEX (high level scientific equipment).





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THE NEW MAP OF FRENCH HIGHER EDUCATION

25 University Clusters to Reach Excellence

The law of July 22, 2013, allows universities, schools and research organizations to coordinate, on a regional basis, the Higher Education and Research activities through three different organizational forms:

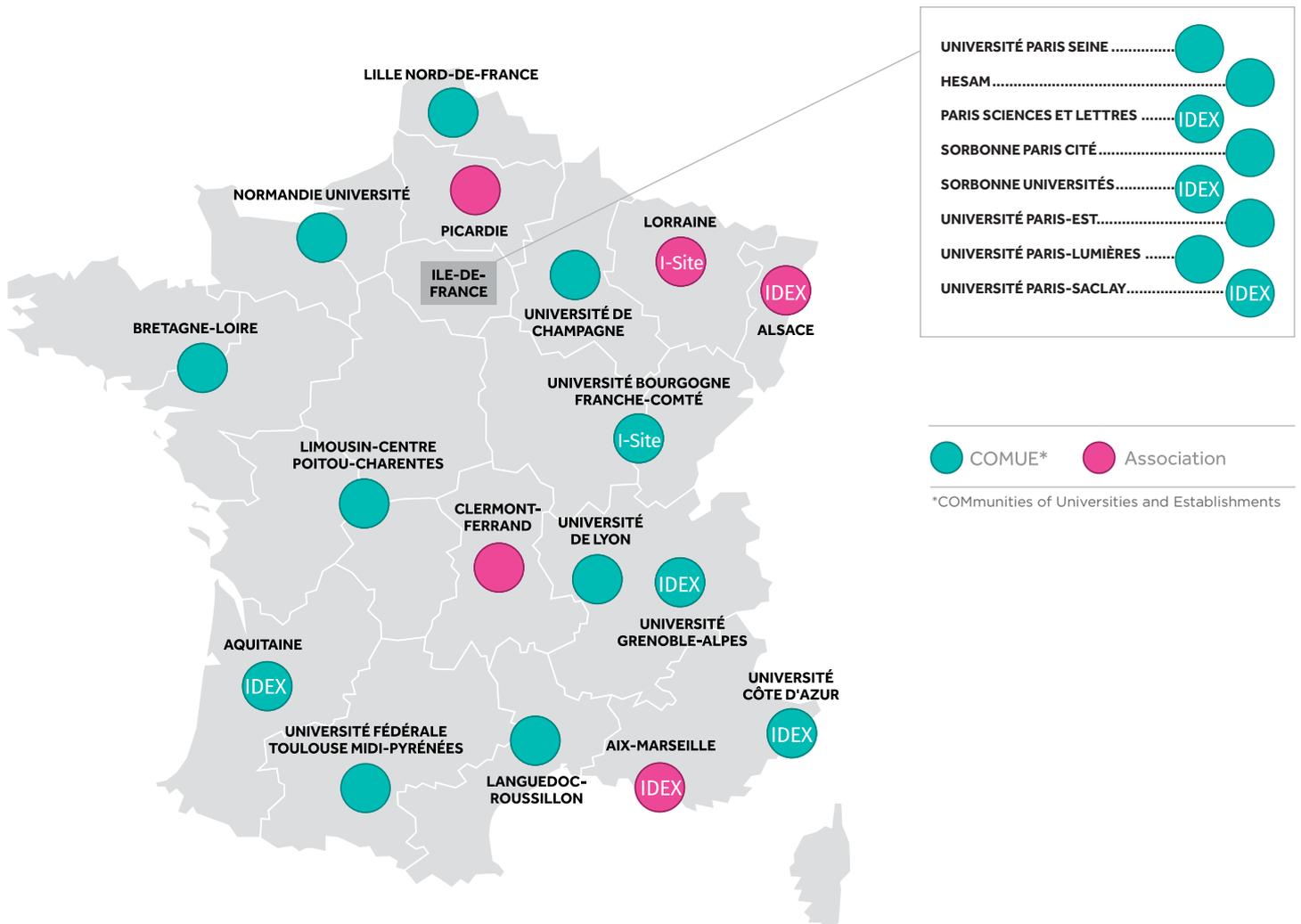
- the *merger* of institutions;
- the creation of *COMmunities of Universities and Establishments* (COMUE) or
- *Associations*.

In some of the major cities in France, institutions have merged to form one comprehensive university, as seen in Strasbourg, Bordeaux, Marseille, Montpellier, Grenoble or Toulouse. In Paris, two of the major universities, Paris-Sorbonne and Pierre-et-Marie Curie University have started a merger process to re-create the historic Sorbonne University.

Merged universities can also be members of a COMUE or an association involving other types of institutions (specialized schools, research organizations).

Some institutions have merged to form one comprehensive university

25 Higher Education & Research clusters





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*France has decided to support
8 university clusters to reinforce their
position as world-leading
research-intensive universities*

IDEX, the flagship initiative of French Higher Education

Through the Investments for the Future program, France has decided to support 8 university clusters to reinforce their position as world-leading research-intensive universities. The Excellence Initiative (IDEX) label has been granted following a national call for proposals and an evaluation led by an international jury. This IDEX Label comes with an endowment of up to €950-million per cluster. These funds, which can represent up to € 32-million per year, are in excess of the institutions regular funding and aimed at the development of new initiatives in education, student life, research, and innovation, including international partnerships.

The 8 French IDEX are:

- Aix-Marseille University
- Paris-Saclay University
- University of Bordeaux
- Paris Sciences & Lettres (PSL Research University)
- Sorbonne University
- University of Strasbourg
- Nice Côte d'Azur University
- Grenoble Alps University

In addition to the IDEX initiative, the PIA program has also targeted regional centers that can have a more focused area of excellence. The I-Site initiative supports strategies such as the local smart-specialization. The two first recipients of the I-Site program are:

- Bourgogne Franche-Comté University
- University of Lorraine





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PROMOTING INNOVATIVE UNIVERSITY PARTNERSHIPS

Research-driven mobility

Research collaborations can be a powerful driver for student mobility.

Student mobility is a key element to sustain research collaborations.

The French Embassy in Australia supports the establishment of research internships within French labs for Australian students. The benefits of this type of collaboration are numerous:

- offering an international research experience to students at an early stage
- reinforcing and sustaining research collaboration through student mobility
- reducing some of the obstacles to mobility, such as language (research is often performed in English in the labs in France)
- rebalancing student mobility between France and Australia

Company Experience Program

The French Embassy also strongly supports internship experiences within companies. By giving hands-on experience in the industry to students, company internships increase their job readiness while improving linkages between universities and industry.

A company internship abroad adds international experience to industry experience. It offers students a life-changing opportunity to discover the globalized marketplace.

A company internship abroad adds international experience to industry experience. It offers students a life-changing opportunity to discover the globalized marketplace. France offers a welcoming legal framework to host interns from overseas. French companies, from larger industry groups to SMEs, have a long history of integrating interns into their teams.



photo credit: MAEDI

Joint diplomas

A joint diploma is a program of study jointly offered by at least two Higher Education institutions, which grants:

- a **double degree**: a specific degree conferred by each of the partner establishments in which the participation of the other establishment is mentioned; OR
- a **joint degree**: a single degree conferred jointly by the partner establishments.

The practice of awarding joint diplomas allows Higher Education institutions to develop a **structured international cooperation** and to establish **global networks**.

In the context of increased international competition to attract the best students, joint diplomas translate into a “win-win” partnership for all Higher Education institutions involved. The joint-diploma programs enhance the appeal of each partner institution thanks to a strong international component.

Joint diplomas translate into a “win-win” partnership for all Higher Education institutions involved

Students registered in a joint-diploma program must attend each partner establishment, in rotation, in order to take classes and/or to conduct their research or complete internships/practicums. These international programs of study are generally very selective.



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photo credit: MAEDI

French Higher Education institutions offer an increasing number of short programs, often with a very strong international component and courses taught in English.

Short programs

To increase Australian student mobility to France and rebalance inbound and outbound streams between the two countries, the French Embassy encourages the promotion and development of short programs such as winter/summer schools in France.

French Higher Education institutions offer an increasing number of short programs, often with a very strong international component and courses taught in English.

These programs cover a wide range of topics and disciplines, from the discovery of French culture, civilization and French language, to highly focused scientific workshops. When integrated into a formal partnership between institutions, they can lead to the awarding and transfer of credits.

Short programs are a useful tool in building institutional partnerships. By bringing together groups of students from different backgrounds for a short period of time, they lay the foundations for the building of shared student and faculty communities.

European programs for Higher Education

European programs offer a wide range of opportunities to support student, faculty and staff mobility as well as institutional partnerships.

The Erasmus+ program, EU's flagship initiative for international education, allows Australian institutions to take part in consortia applying for one of the various calls for projects.



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FOCUS ON COLLABORATIONS AT THE PHD LEVEL

Joint “Cotutelle” PhD

What is a “Cotutelle”?

A cotutelle is a program at the doctoral level offered by two Higher Education institutions, which allows the student to graduate with a **double degree or a joint PhD degree**. The research work of the doctoral candidate is overseen by **two thesis supervisors**, one from each partner institution. Therefore, it is not a case of granting “two PhD degrees for a single thesis”, but rather of **jointly** recognizing the work accomplished by the student in both institutions, under the supervision of the two faculties.



photo credit: MAEDI

International joint PhD’s were initiated by France.

Since 1994, a decree on the creation of a mechanism for “cotutelles” has been encouraging universities to become involved in joint PhD programs with other universities in different parts of the world.

A joint “cotutelle” PhD allows a doctoral candidate to gain knowledge about the research methods and scientific approaches of both countries. It is a unique opportunity that opens access to the international level of research.

In addition, cotutelles facilitate the establishment and strengthening of collaborations between research laboratories within the two countries and can be an essential component of university-wide strategic partnerships. All French establishments authorized to grant doctoral degrees have implemented cotutelles and promote them as key instruments in their international policies.

Implementation of a Cotutelle

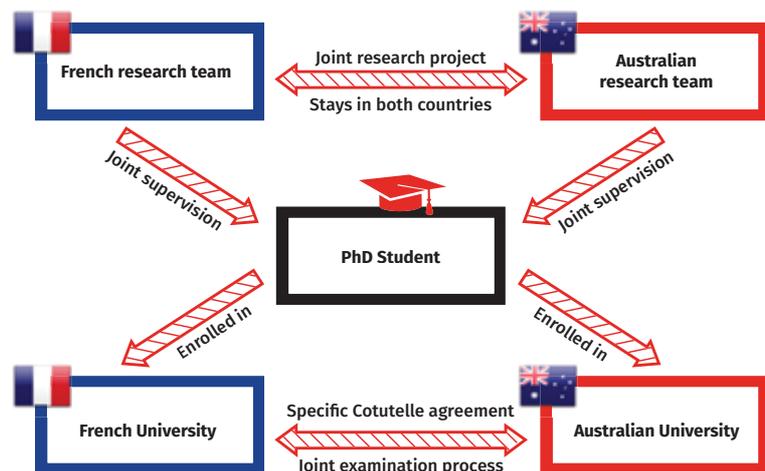
Each cotutelle is made official by a “Convention for cotutelle”, an agreement signed by the partner institutions, the supervisors and the student. **Therefore, each cotutelle is different as it is adapted to individual students.**

The Convention outlines the subject of the thesis, conditions of thesis defence, as well as the parameters related to the evaluation of research and to intellectual property.

In order to facilitate the implementation of joint “cotutelle” PhD as part of institutional partnerships, framework cotutelle agreements can be signed between universities. Each cotutelle is then performed under the umbrella of this framework agreement, with an individual agreement then being established for each PhD candidate.

A framework agreement guarantees that **each institution’s specific academic and administrative requirements will be respected.**

The French legislation offers **great flexibility** to the universities in the establishment of a joint PhD. Article 20 of the Decree of May 25, 2016, authorizes universities to bypass French mechanisms if these are contradictory to the requirements made by the foreign partner institution.





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PhD with industry placement: the CIFRE model

France has a long tradition of strong linkages between Higher Education and Industry. Most of the master's programs incorporate mandatory internship periods that are part of the evaluation.

PhD candidates have the opportunity to perform research in France in an industrial context thanks to the CIFRE program. CIFRE stands for Industrial Agreement of Training through Research. It was established more than 30 years ago in France.

CIFRE fellows sign a **full time work contract** with a French company with a minimum gross annual salary of € 23 484. The PhD candidate is hired to conduct a strategic research project for the development of the company.

At the same time they are enrolled in a doctoral program in a French university and attend all the relevant courses. They are monitored by a thesis supervisor in the lab and by a mentor in the company.

The research undertaken by a CIFRE fellow is performed within the framework of a public / private partnership between a French host company and the laboratory. All types of companies can participate, from large industrial groups to SMEs. Thanks to public subsidies (individual subvention for each CIFRE fellow of € 14.000/ year and tax incentives through the "Credit Impôt Recherche") the overall cost of a hiring a CIFRE fellow can be reduced by 50% for the company.

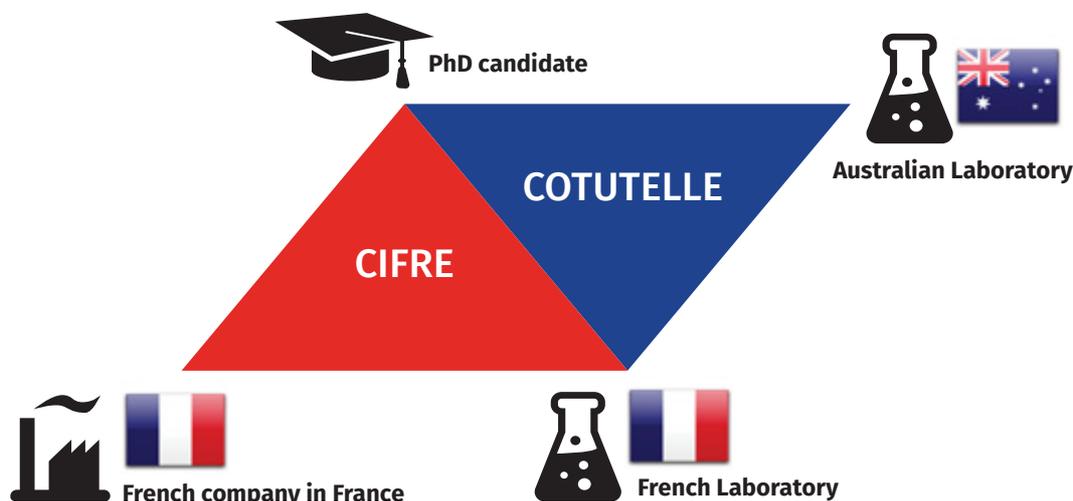
An important benefit is that **the fellow works in the company as well as the laboratory, thereby gaining valuable experience in both worlds** and understanding their different research aims and approaches.

The CIFRE and the cotutelle models can be combined for triangular University/University/Company PhD projects. These types of partnerships are extremely valuable as they contribute to reinforcing international research partnerships AND linkages to industry at the same time.



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The CIFRE / cotutelle model





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NATIONAL RESEARCH AGENCY

ANR is the French National research council.

ANR provides funding for project-based research in all fields of science - for both basic and applied research - to public research organizations and universities, as well as to private companies (including SMEs). Employing a method based on competitive peer reviews compliant with international standards, ANR provides the scientific community with instruments and programs promoting creativity and openness, and stimulate new ideas and partnerships, particularly between academia and industry. In 2015, ANR received 528 million euros for funding of projects and 26.6 billion euros for the Program of Investments of Future. Its activity also contributes to enhancing the competitiveness and the influence of French research in Europe and across the world.

Since 2010, the ANR has been appointed by the government to operate the actions of the Program of Investments of Future related to higher education and research.

The Agency also participates in the financing of the regional **Competitiveness Clusters** and **Carnot Institutes** which contribute to research excellence and reorganization at the French national level.

ANR has designed and deployed a range of funding instruments to satisfy both the project-based funding needs of the research communities and the public policy for research and innovation in France.

ANR Instruments for International Collaboration

In order to increase the influence and attractiveness of French research and contribute to the construction of the European Research Area (ERA), ANR makes specific funding instruments available to researchers. These actions give precision to and complement those carried out under the European Commission's "Horizon 2020" framework program. They encourage the development of high-level international research partnerships, helping French teams assume leadership roles in European and international programs.

- To simplify and strengthen researchers' bilateral partnerships, "International Collaborative Research Projects" (PRCI) are included in the generic call for proposals. This instrument is underpinned by agreements concluded between ANR and a sister agency in another country (no agreement of that type exists with Australia currently)
- To help simplify and strengthen international research partnerships on targeted themes and disciplines, ANR launches **specific calls in European and international frameworks: bilateral and multilateral calls** in the framework of Joint Programming Initiatives (JPIs), FP7 (ERA-NETs and ERA-NET+ for instance) and Horizon 2020 (e.g. ERA-NETs Cofund) – as well as within the framework of other multinational actions revolving around global challenges (the Belmont Forum)
- In order to strengthen the position and influence of French research in European and international spheres, the instrument "**Setting up European or international scientific networks**" (MRSEI) is subject to a specific call for proposals.
- To facilitate hosting of world-renowned French and foreign researchers, the "**Hosting high-level researchers**" (ACHN) instrument is subject to a specific call for proposals.



ANR Facts and Figures 2015 Activity



275 staff
representing 250 full-time-equivalents



€553.7 M
2014 operating budget



More than 8,000 peer reviewers
from all over the world

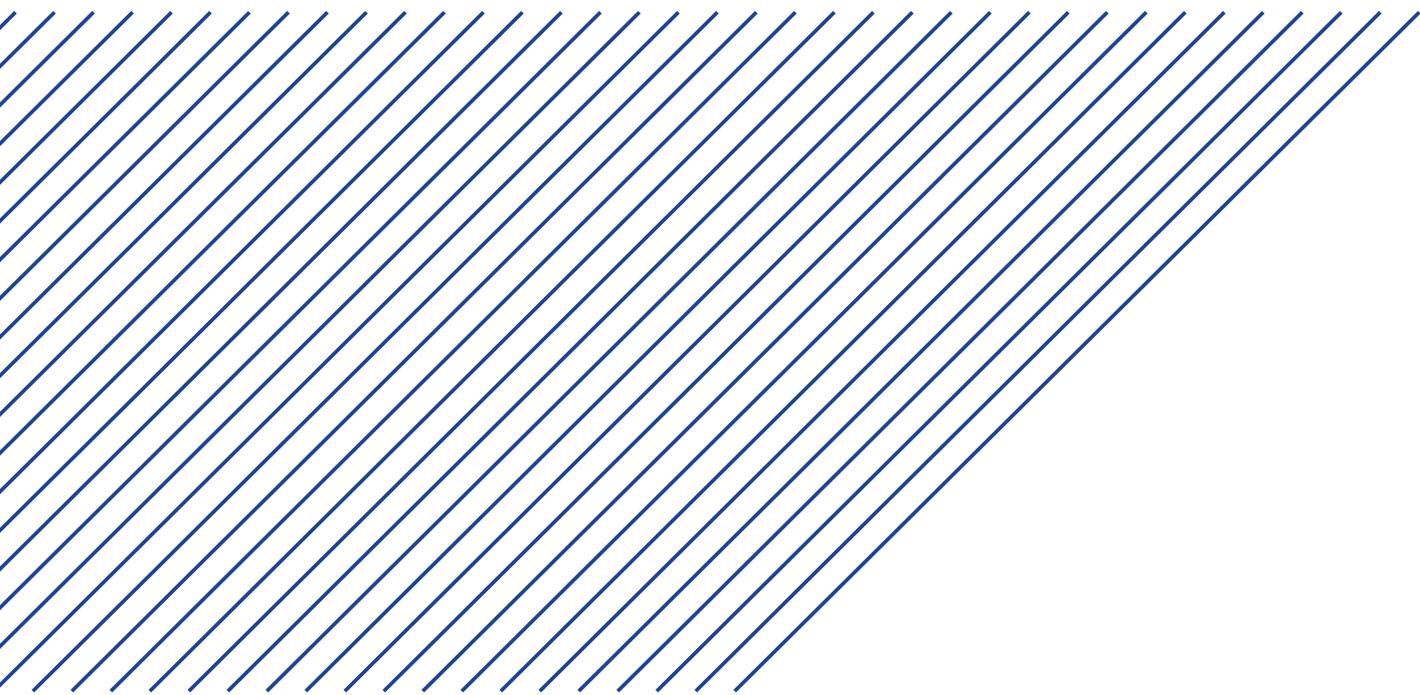
For more information, visit:

www.agence-nationale-recherche.fr/Accueil

More on calls for project proposals:

www.agence-nationale-recherche.fr/AAPProjetsOuverts

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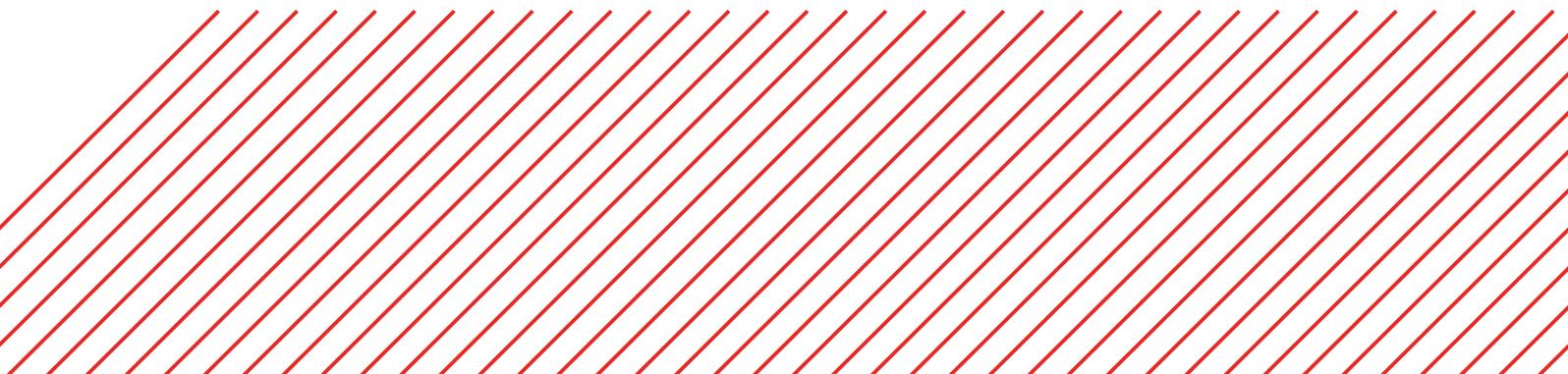
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NATIONAL CENTER FOR SCIENTIFIC RESEARCH

Founded in 1939, The **French National Center for Scientific Research** is the largest governmental research organisation in France and the largest fundamental science agency in Europe. CNRS conducts research on **issues related to science, technology and society**. The Center develops collaborations with specialists from a variety of disciplines and particularly with universities.

CNRS carries out research in all major disciplines through its ten institutes which are responsible for outlining, developing and coordinating research in their respective domains on both the national and international level.

- Institute of Chemistry (INC)
- Institute of Ecology and Environment (INEE)
- Institute of Physics (INP)
- Institute of Nuclear and Particle Physics (IN2P3)
- Institute of Biological Sciences (INSB)
- Institute for Humanities and Social Sciences (INSHS)
- Institute for Computer Sciences (INS2I)
- Institute for Engineering and Systems Sciences (INSIS)
- Institute for Mathematical Sciences (INSMI)
- Institute for Earth Sciences and Astronomy (INSU)



International Cooperation

The CNRS has developed different kinds of instruments to support international cooperation:

PICS = International Project of Scientific Cooperation

PICS is a scientific project jointly established and presented by two research teams, one in CNRS and the other located abroad. The program duration is three years non-renewable and aims to consolidate and formalize a pre-existing cooperation between the French and foreign partners who have already produced one or more joint publications.

UMI = International Joint Units

International Joint Units are the association of foreign laboratories or groups of laboratories of excellence with French laboratories. Each year, CNRS appoints young researchers and research professors for a one-year stay in order to promote the work of the unit as well as the cooperation with the French teams and to contribute to the education of the young scientists who are sent to the location.

LIA= International Associated Laboratory

An International Associated Laboratory is a “laboratory without walls”, which allows a French research team and a foreign research unit to work on a defined, joint project.

GDRI = International Research Network

A GDRI is a research network, without legal personality, which connects public and/or private laboratories for a duration of four years with one possibility of renewal. The GDRI brings together several laboratories from at least two countries for scientific cooperation on a specific theme.

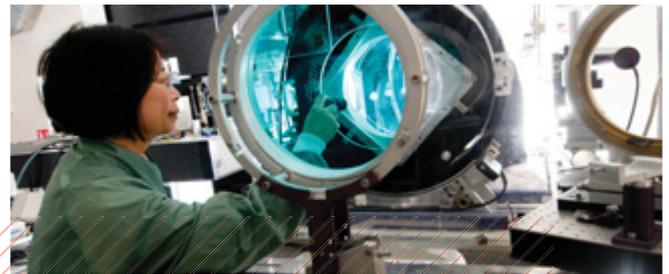


photo credit: © CNRS
Photothèque / Kaksomen

CNRS in Australia:

The CNRS is currently the French institution which has the most structured research cooperation with Australia. Australia is the 15th country partner for the CNRS, and the 9th scientific destination for missions beyond Europe.

The CNRS has 10 PICS with Australia, 8 LIA's, mostly in the STEM fields, and 1 GDRI exists in Australia on Ecosystem Health and Environmental Disease Ecology.

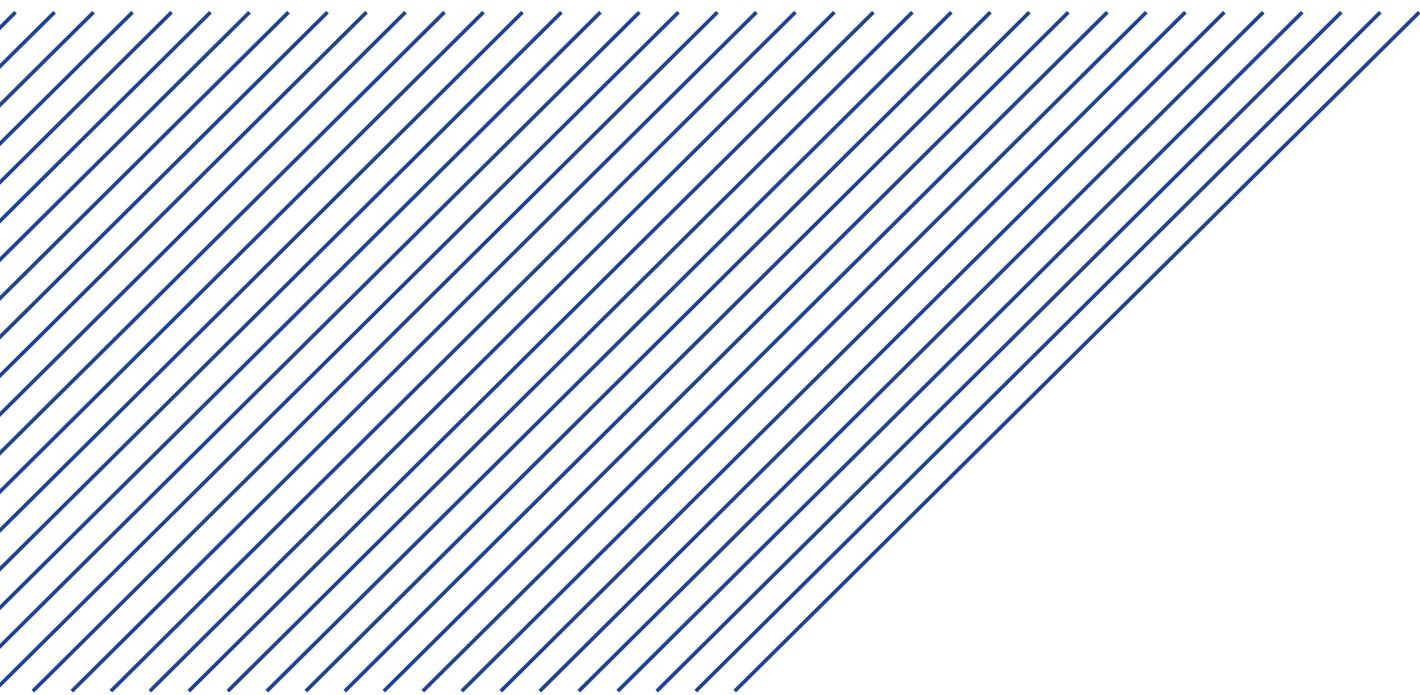
CNRS has partnering agreements with some ARC centers of excellence.

A MoU was signed in 2015 between the CNRS and the University of Melbourne to support scientific mobility.

For more information, visit:

<http://www.cnrs.fr/derci/spip.php?article188&lang=en>

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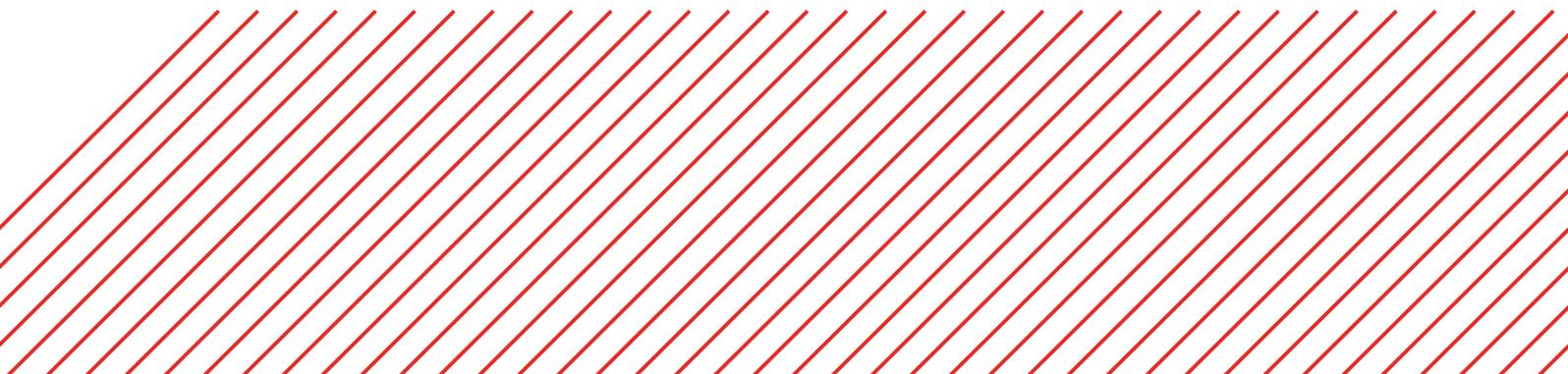
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NATIONAL INSTITUTE FOR HEALTH AND MEDICAL RESEARCH



The National Institute for Health and Medical Research (Inserm), established in 1964, is under the joint authority of the Ministry for Health and the Ministry for Research.

Inserm is the only French public research organization that is entirely dedicated to human health.

In 2008, the Institute was assigned the responsibility of ensuring strategic, scientific and operational coordination of biomedical research. This central role of coordinator is more than suitable for Inserm due to its scientific expertise and its capability to conduct translational research, advancing research results from the lab to clinical practice. In 2008, this mission of coordination led to the creation of 9 specialized institutes associated with Inserm. The work done by the Institute is based on fundamental research.

3 Important Priority Areas Of Research

- Research in physiology/physiopathology for better understanding of diseases
- Therapeutic research (research on medication, biomedical engineering, clinical treatment)
- Research in public health to gain new knowledge on determinants of population health

Specialized Institutes

- Cancer
- Immunology, inflammation, microbiology and infectious diseases
- Physiopathology, metabolism, nutrition
- Neurosciences, cognitive science, neurology and psychiatry
- Public health
- Health technology
- Molecular and structural basis of life sciences
- Cell biology, development and evolution
- Genetics, genomics and bioinformatics

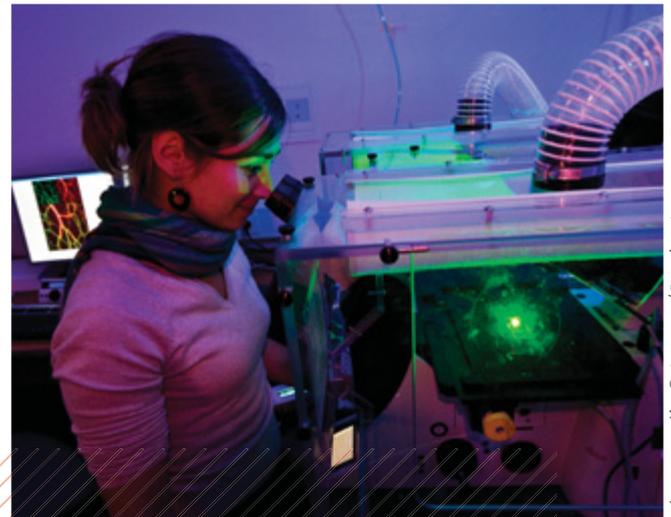


photo credit: © Inserm/Patrice Latron

Inserm in Australia:

With 110 on-going individual cooperations, Australia is Inserm's 4th partner beyond Europe, and is ranked 3rd for co-publication with the institute. The institute had an institutional agreement which concluded in 2014 with the University of Sydney to support short term mobility and workshops in the fields of neuroscience, mental health, cancer, infectious diseases, diabetes, obesity and cardiovascular diseases.

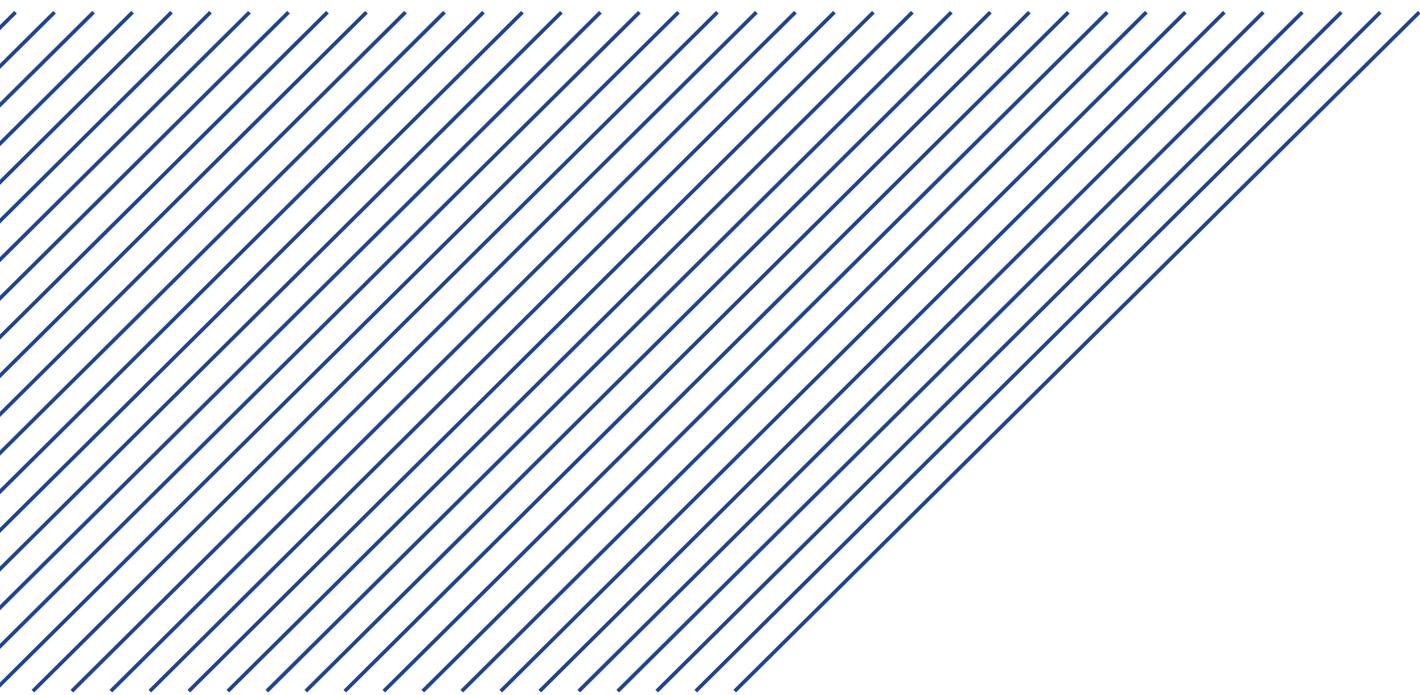
Numbers

Inserm has 5093 staff, 2131 being researchers. The Institute includes a network of 281 research laboratories. Inserm had an operating budget of 988 million euros in 2015.

For more information, visit:

<http://english.inserm.fr/>

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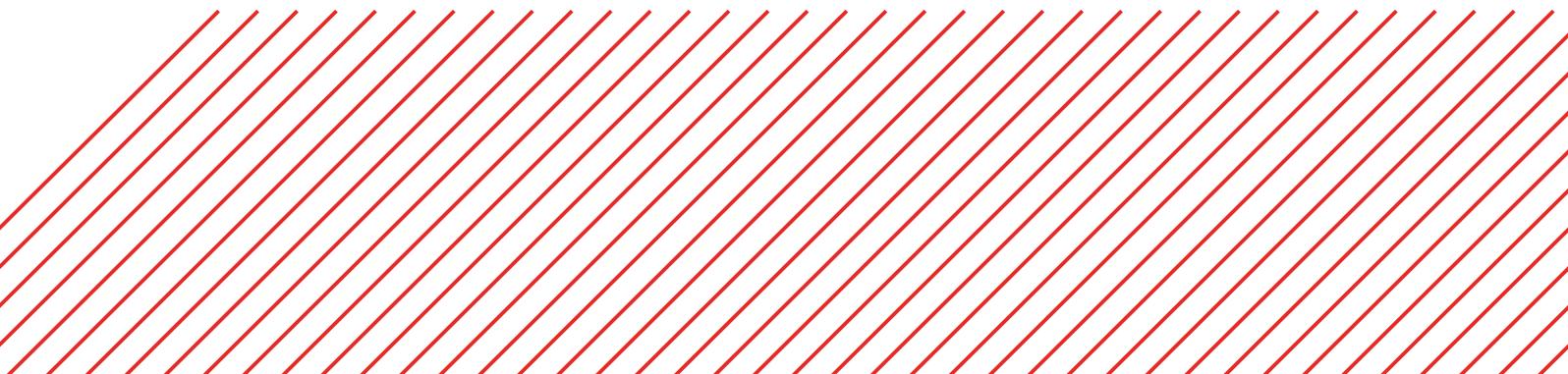
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FRENCH NATIONAL SPACE AGENCY

The French National Space Agency, established in 1961, is the French government space agency (administratively, a “public administration with industrial and commercial purpose”). Its headquarters are located in central Paris and it is under the supervision of the French Ministries of Defence and Research.

The CNES is a program agency which develops and leads national space programs. The Center is responsible for advising the French government on its space policy within the EU and for implementing them. The CNES therefore ensures the participation of France in the European Space Agency (ESA). The Center relies on the industry and research laboratories of high calibre and collaborates with scientific and industrial partners on execution of space programs.



Five Areas of Application:

Access to Space

- The CNES guarantees France’s access to space. France was the third power to obtain such technology.

Sustainable Development

- It accumulates knowledge about lands, oceans and atmosphere and their evolution, through satellite observation and measurements.

Civil Applications

- The Center assists with creation of new services (development of new communication technologies, search and rescue programs, etc.)

Security and Defence

- It provides autonomous access to information, localization systems, and civil and military intelligence.

Research and Innovation

- The CNES conducts research on orbiting telescopes (Intégral, XMM, Corot...), space probes (Cassini-Huygens (Saturn/Titan), Venus Express, Planck and Herschel (evolution of the Universe), Rosetta (Study of a Comet) Mars Express, Gaia (astrometry), Bepi-Colombo (Mercury) etc.), new satellites: Demeter (earthquakes), Parasol and Calipso (radiative impact), Mégha - Tropiques (water cycle). Future research will probe the principle of general relativity (Microscope), study X and gamma rays (Taranis), and explore the origin of the Universe’s expansion and the nature of dark energy (Euclid).

CNES In Australia:

There is a long track record of cooperation between CNES and Australia, with partners such as Geoscience Australia and CSIRO, mostly in the field of instrumentation and satellite data. A recent agreement has been signed between CNES and CSIRO for the launch of the Telescope PILOT from Alice Springs in March-April, 2017.

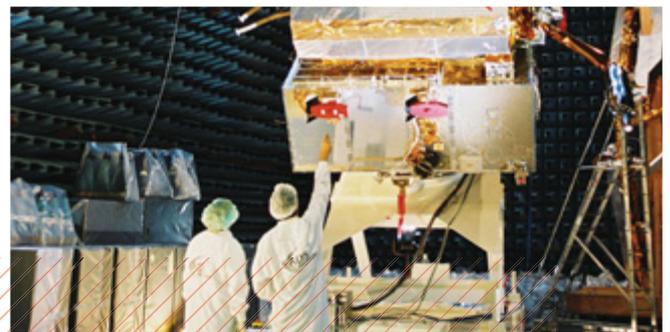


photo credit: © CNES / ESA

List Of CNES Centers

CNES Headquarters in Paris directs administrative operations and defines strategic guidelines for the agency’s technical centres. The Headquarters defines and executes France’s space policy in Europe.

Evry Space Center leads all developments for the Ariane program, from production to marketing, under contract to the European Space Agency. The Center leads prospective research on new concepts for launchers and advanced propulsion systems.

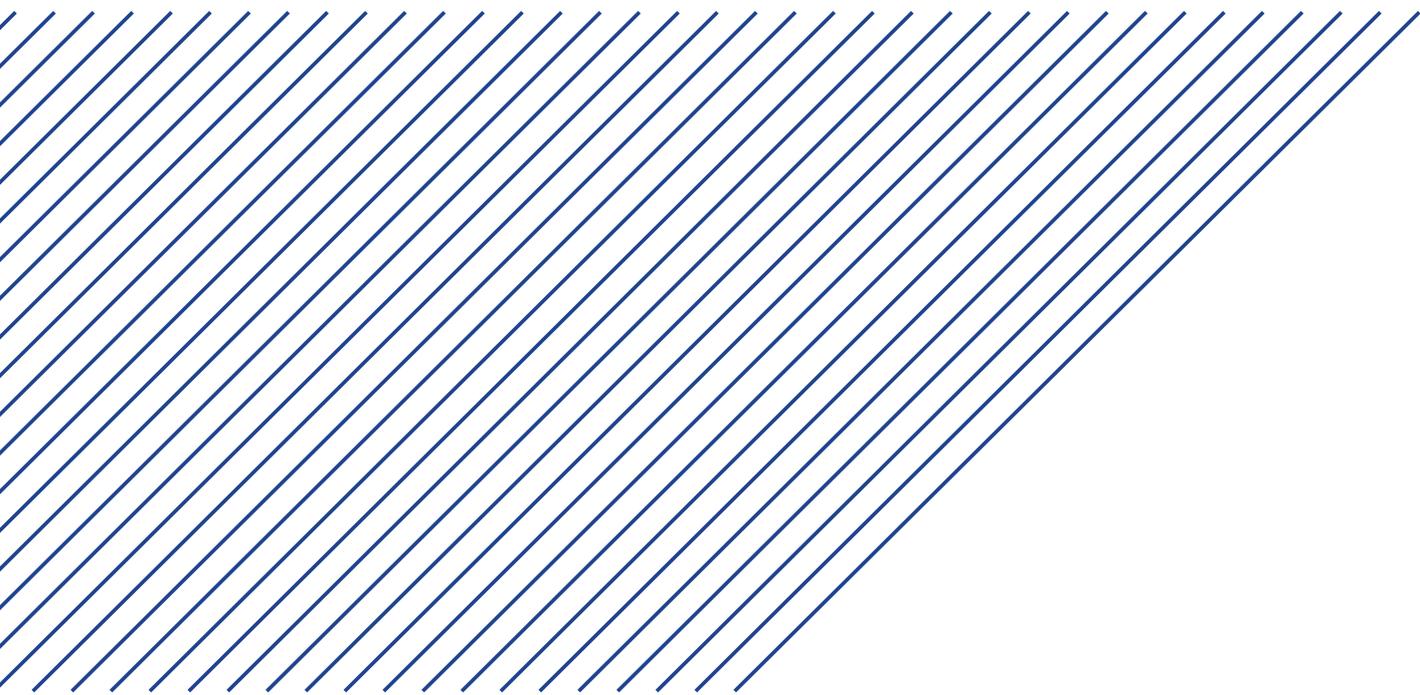
Toulouse Space Center (CST), a technical and operational complex, leads projects on orbital systems and develops complete space systems in partnership with the industry and scientific research laboratories, right up to their entry into operational service. The CST also conducts satellite positioning operations and is responsible for all balloon activities.

Guiana Space Center (CSG) is Europe’s spaceport. Dedicated to the Ariane launcher and soon to the Soyuz and Vega launchers, the CSG oversees the activities of the French base.

For more information, visit:

<https://cnes.fr/en>

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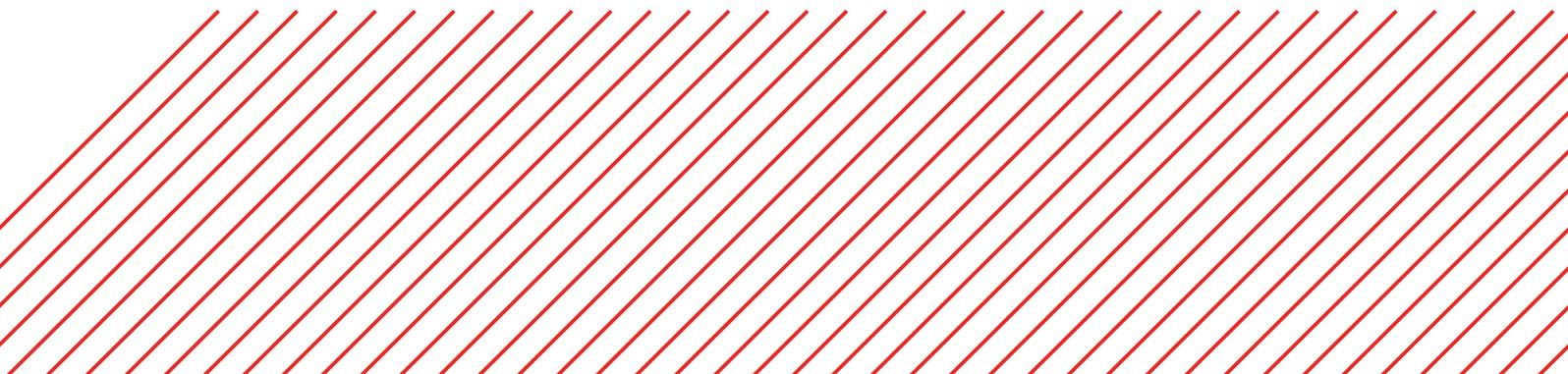
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NATIONAL INSTITUTE FOR AGRONOMIC RESEARCH

The National Institute for Agronomic Research (INRA) is a French public research institute dedicated to agricultural and agronomic science. It was founded in 1946 and is a Public Scientific and Technical Research Establishment under the joint authority of the Ministries of Research and Agriculture.



As the first institute for agronomic research in Europe and the second of its kind in the world, INRA conducts applied research for healthy and quality food, competitive and sustainable agriculture, and a preserved and valued environment.

Research conducted by INRA is guided by the evolving scientific questions and oriented toward solving challenges facing the planet in terms of feeding the world, sustainably managing plant and animal health or adapting to climate change. The Institute develops its expertise for the benefit of public decision making. The Institute's mission is to produce and share knowledge, invest in new innovation and know-how, clarify decisions, contribute to the scientific culture and scientific/societal debate, and to educate by and for research.

4 trans-disciplinary research priorities:

- Improving the economic, social and environmental facets of agriculture
- Reducing greenhouse gas emissions and adapting to climate change
- Developing healthy and sustainable food systems
- Promoting the sustainable use of biomass in chemical, energy and bioeconomic applications

2 emerging inter-disciplines:

- Predictive approaches in biology
- Agro-ecology"



© INRA / Christophe Maitre

International Presence

INRA is among the top three world institutes in agronomic, food and environmental research. The Institute has been developing a strong international policy in order to maintain an active presence among the scientific communities of both developed and developing countries in terms of scientific and agricultural planning (Brazil, China, India). Its strategy of international alliances is shaped by its significant scientific priorities as well as by its prioritizing of scientific themes.

INRA In Australia:

With a growing number of co-publications with INRA, Australia has become the 3rd international partner of the institute outside Europe.

INRA has signed a MoU with CSIRO in 2015 to facilitate the bilateral cooperation, and is collaborating with the organization in phenotyping, genomics, modelling soil and culture, agriculture resilience to climate change and environmental problems.

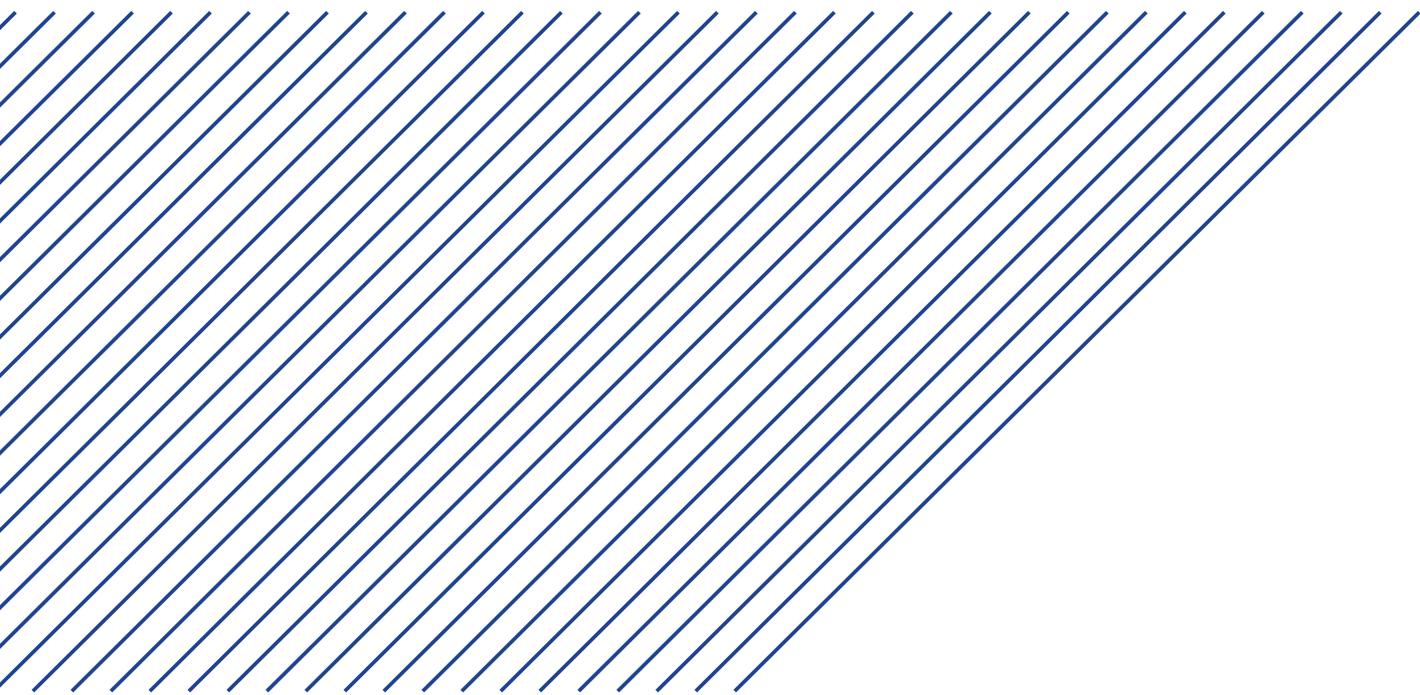
Numbers

In 2015, INRA published 4081 articles, had 55 new patents and created 14 new plant species. The Institute hosts 14 scientific departments divided into 20 regional centres. INRA had an operating budget of 881.6 million euros in 2015.

For more information, visit:

<http://www.inra.fr>

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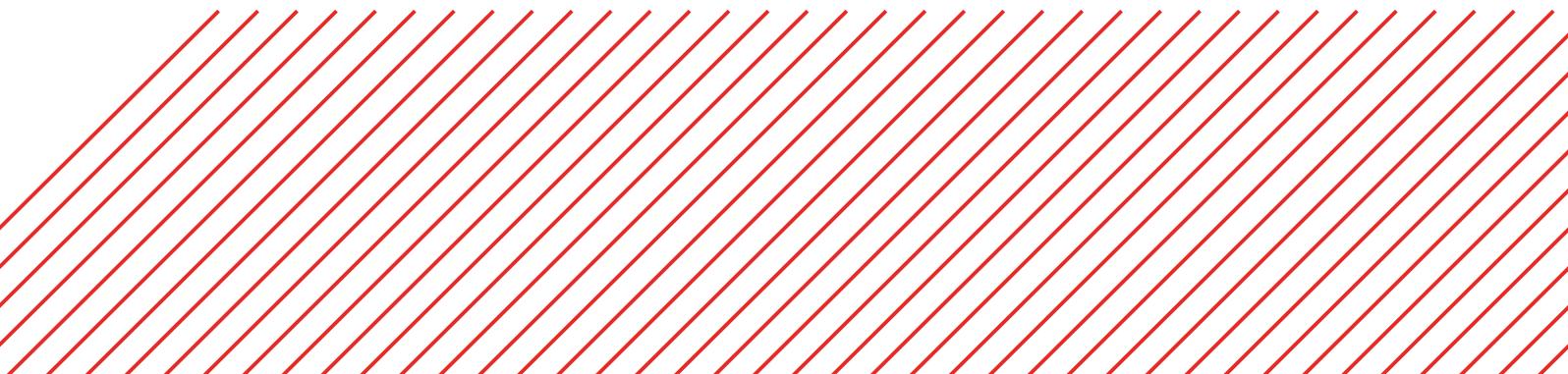
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NATIONAL INSTITUTE FOR RESEARCH IN COMPUTER SCIENCE AND CONTROL

inria
INVENTEURS DU MONDE NUMÉRIQUE

The National Institute for Research in Computer Science and Control (INRIA) established in 1967, is a French national research institution focusing on computer science and applied mathematics. INRIA is a Public Scientific and Technical Research Establishment under the double supervision of the French Ministry for National Education, Higher Education and Research and the Ministry for Economy, Finance and Industry.

Its objective is to conduct fundamental and applied research in the areas of Science, Information and Communication Technology (STIC). The Institute also promotes the exchange of technology by dedicating a great deal of attention to research, transfer of scientific and technical information, development, expertise, and participation in international programs. The source of many innovations that add value and create jobs, INRIA transfers expertise and research results to companies (startups, SMEs and major groups) in fields as diverse as healthcare, transport, energy, communications, security and privacy protection, smart cities and the factory of the future.

More than 90 companies have been established thanks to the support provided by the INRIA-Transfer branch that specializes in the follow-up, evaluation, qualification and financing of young, innovative companies in high computer technology.

Priority Areas:

The key objective of INRIA for the period between 2013 and 2017 is to realize scientific and technological breakthroughs in priority areas:

- Modelling, simulation and optimization of complex dynamic systems
- Programming: safety, security and reliability of computer systems
- Transforming complex flows of data into trustworthy knowledge libraries
- Communication, information and ubiquitous calculation
- Interaction with real and digital worlds



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INRIA also works for the digital transformation of science that serves individuals, society and knowledge:

- Health and well-being
- Energy and natural resources
- Environment and sustainable development
- Society and Education

INRIA in Australia:

- The University of Sydney works with INRIA on analysis and visualisation
- CSIRO Business unit Data 61 works with INRIA on Artificial Intelligence and Operations Research
- Macquarie University works with INRIA on management of dynamic networks and services"

Numbers

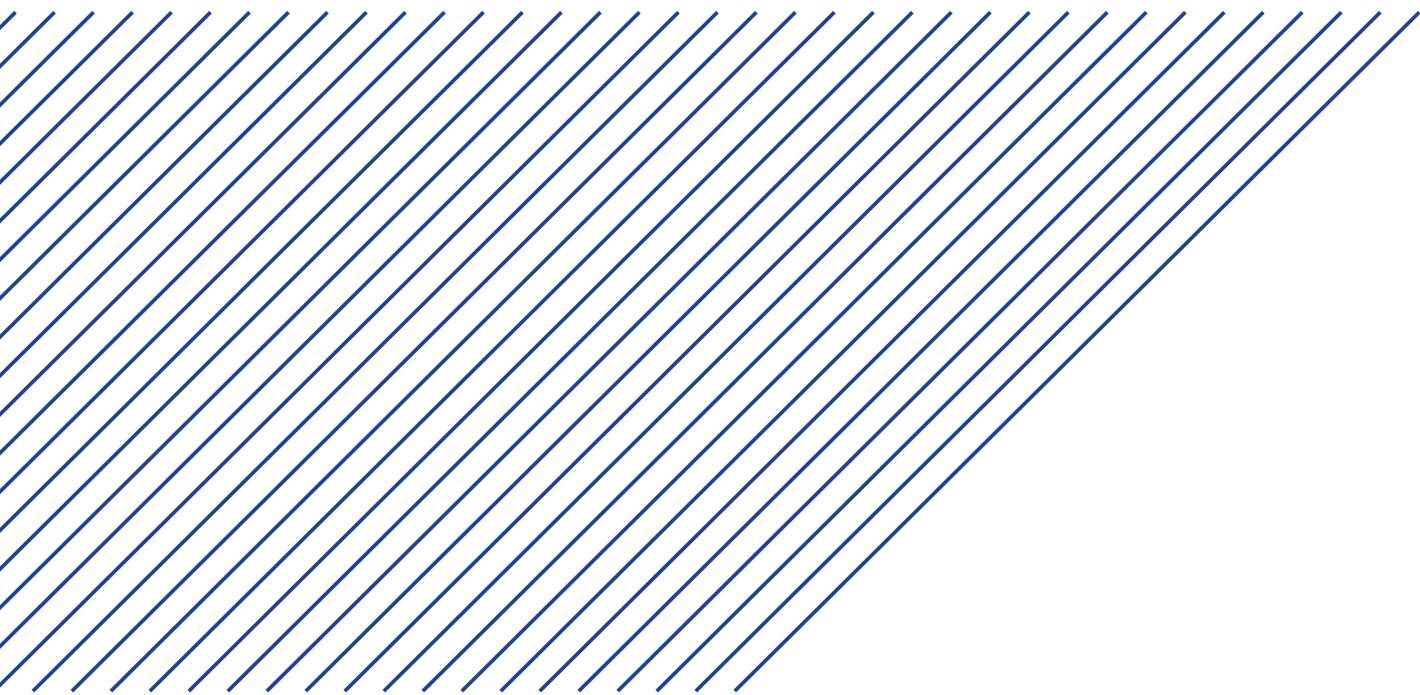
INRIA published 4600 scientific articles in 2015 and owns 390 patents. The Institute has 8 research centres located in Rocquencourt, Rennes, Sophia Antipolis, Grenoble, Nancy, Bordeaux, Lille and Saclay.

INRIA has an annual operating budget of 230 million euros.

For more information, visit:

<https://www.inria.fr/en/>

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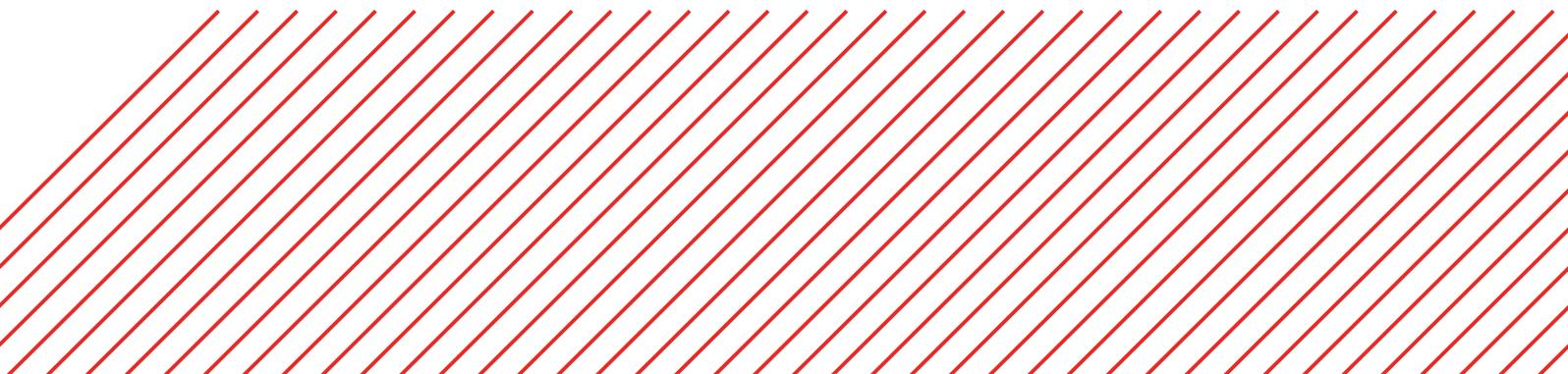
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NATIONAL RESEARCH INSTITUTE OF SCIENCE AND TECHNOLOGY FOR ENVIRONMENT AND AGRICULTURE



Formerly CEMAGREF, renamed IRSTEA in 2012, the National Research Institute of Science and Technology for Environment and Agriculture is under the auspices of the Ministry for Research and the Ministry for Agriculture and Fisheries. The Institute has evolved its strategy and skills following the evolution of the needs of its public, territorial and industrial partners: its researches gradually took into account the new environmental stakes arising in agriculture, ecosystems, and territories (prevention of environmental risks, city-countryside relationship, and issues related to sub-urban environments).

Its mission is to protect and manage land and water systems, to revitalize economic activities that use them on a sustainable basis, and to prevent associated risks.

The Center combines high-quality scientific research with developments in social and public policies to produce concrete solutions to the benefit of decision-making authorities that results in action.

Research domains:

- Water sources, uses and risks
- Water environments, quality and discharge
- Land management
- Eco-technologies and agricultural systems
- Common scientific methods

IRSTEA Internationally

IRSTEA has collaborative research with a number of research institutions and higher education institutions outside of Europe. These agreements provide IRSTEA with a solid research and expertise network worldwide.

Cooperation With Australia

The IRSTEA has several research cooperation agreements in Australia. IRSTEA key Australian partners are CSIRO, The Australian National University, the University of Western Australia, the University of Newcastle, the University of Sydney, the University of Technology Sydney and Monash University.

A Memorandum of Understanding has been signed in 2016 with the ANU to develop and promote cooperation in the fields of research and research training. This recent agreement builds on long track records of cooperation in water governance issues in the Pacific.



photo credit: CC BY-SA 3.0

The Water Governance in Oceania Project is co-funded by the French Ministry of Foreign Affairs and other partners such as the Pace-Net Plus EC project, the ANU, IRSTEA, IRD IAC, LISODE and Majulla Inc. It forms part of the activities of the French-Australian Water and Land Management Initiative."

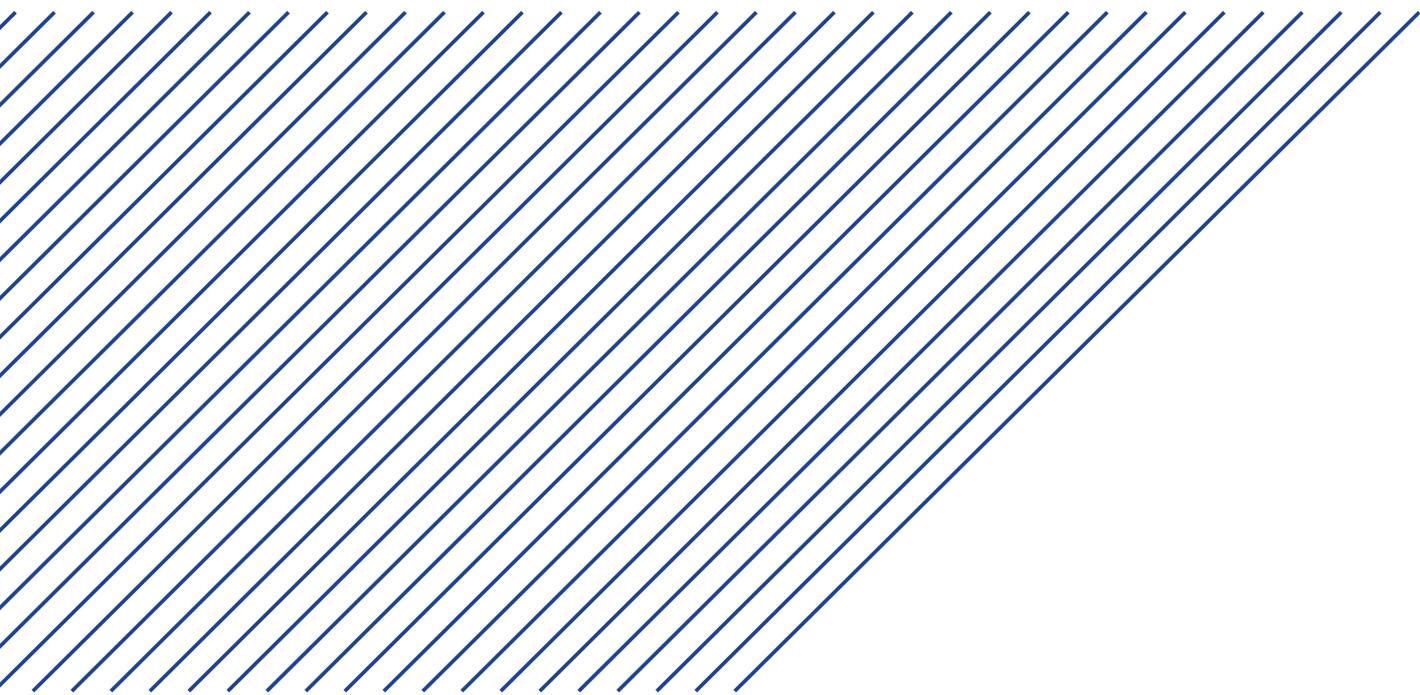
Numbers

The IRSTEA has 9 main sites, 14 research units, and 8 experimental and research infrastructures.

The Institute had an annual operating budget of 109.5 million euros in 2015.

For more information, visit:
<http://www.irstea.fr/en/accueil>

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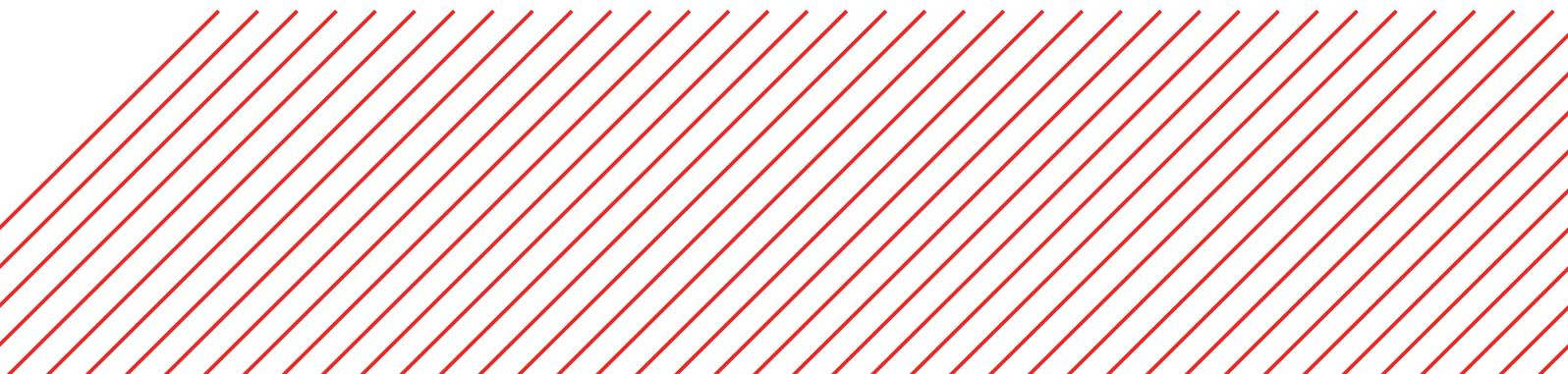
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FRENCH RESEARCH INSTITUTE FOR EXPLOITATION OF THE SEA

Established in 1984, the French Research Institute for Exploitation of the Sea (Ifremer) was placed under the joint auspices of the Ministry for Ecology, Energy, Sustainable Development and the Sea, the Ministry for Research and Higher Education, and the Ministry for Food, Agriculture and Fisheries.

Ifremer contributes through its projects and expertise to the knowledge of the oceans and their resources, to the monitoring of the sea and land habitats, and to the sustainable development of marine activities. To this purpose, Ifremer creates and implements monitoring, experimentation and observation tools and manages the French oceanographic fleet for the entire scientific community.

Organization

The organization of Ifremer is based on the following three structures:

- the Programs and Strategy Direction leads and coordinates scientific and technological activities (themes, programs, projects)
- 5 Centers for Operations to which units (departments, laboratories) are attached
- the Functional Directions (Financial, Legal, Communication, Operations and Navy Capabilities, Human Resources and Evaluation)

Research Areas

Four research departments have been created and cover all activities related to research and study, technological development, monitoring, expertise and institute evaluation.

- The Department for Marine and Digital Infrastructures (to improve and promote Ifremer infrastructures)
- The Department for Oceanography and Ecosystems Dynamics (to observe and model oceans and coastal zones)
- The Department for Biological Resources and Environment (to study the marine resources, sustainable exploitation and promotion)
- The Department for Physical Resources and Ecosystems of the Deep Sea (to explore the interactions of materials and structures with the marine environment and renewable marine energies)

Ifremer

Ifremer is a source of knowledge, innovation, and monitoring and expertise data for the marine world, simultaneously dealing with political policies and socio-economic issues. It is the sole organization of its kind in Europe.



photo credit: © Photo libre de reproduction - Reporter mention d'origine

IFREMER In Australia:

Ifremer has developed scientific and technological cooperation with Australia:

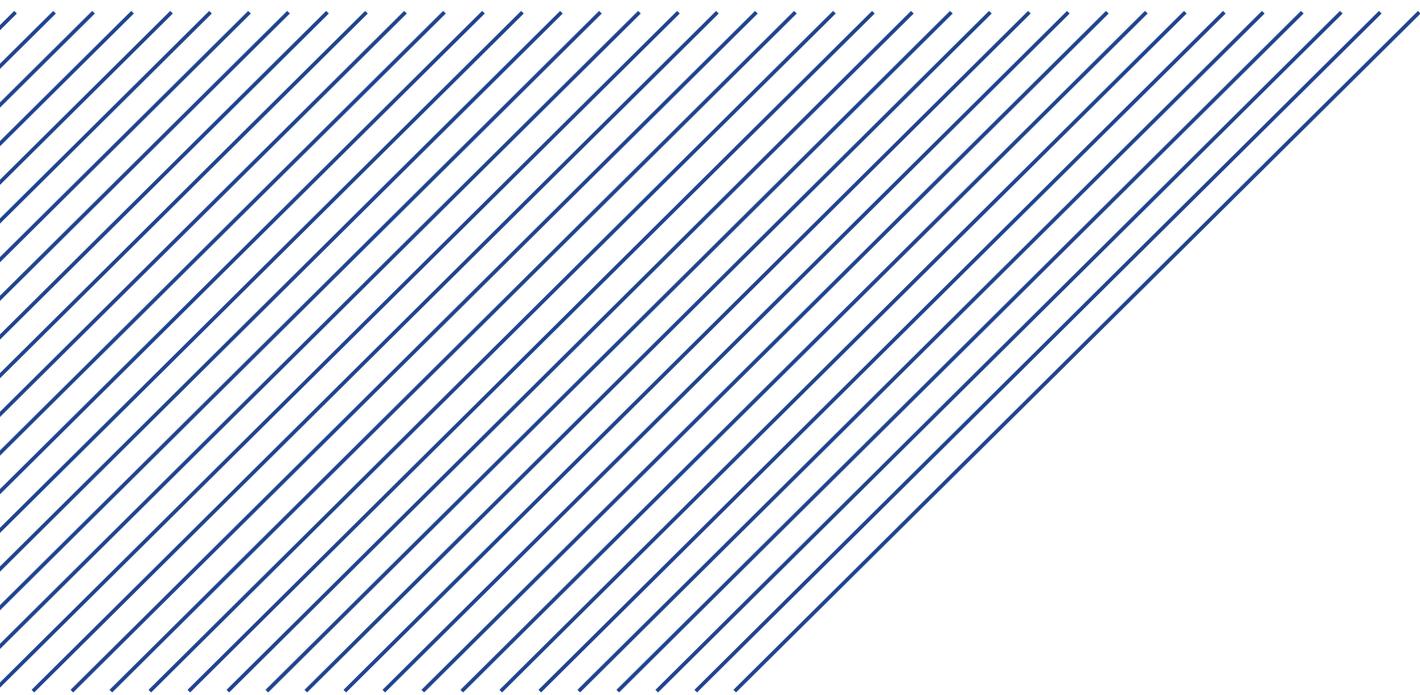
- For aquaculture: with AIMS, James Cook University, DPI Queensland and CSIRO, UNSW
- For geoscience and deep marine resources: with Geoscience Australia
- For biodiversity and protected marine areas: with the University of Tasmania
- For Mangrove swamps and halophytes: with the University of Queensland
- For methodological guides: with AIMS
- For Ocean dynamics, temperature and salinity of the water (ARGO project): with CSIRO

Numbers:

Ifremer has an operating annual budget of 210 million euros. The Institute employed 1464 staff and published 450 scientific articles in 2015. It also has 6 ships (3 seafaring), a manned submersible, 2 remotely operated vehicles for great depths (- 6 000 m), and two AUVs.

For more information, visit:
http://wwz.ifremer.fr/institut_eng/

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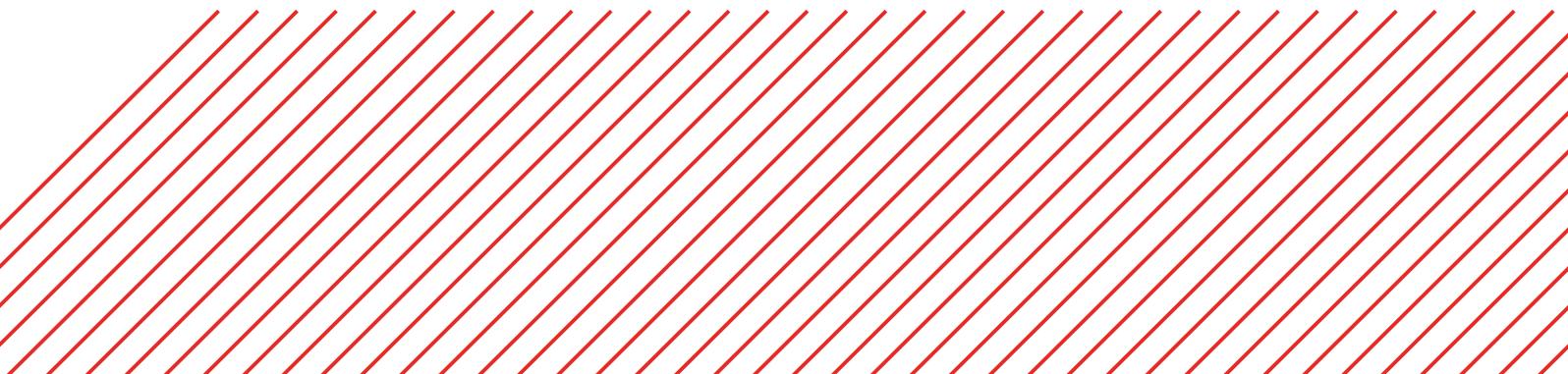
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ALTERNATIVE ENERGIES AND ATOMIC ENERGY COMMISSION

The French Alternative Energies and Atomic Energy Commission (CEA) is a key player in research, development and innovation in four main areas: defence and security, nuclear energy (fission and fusion), technological research for industry, fundamental research in the physical sciences and life sciences. Drawing on its widely acknowledged expertise, the CEA actively participates in collaborative projects with a large number of academic and industrial partners.

The CEA is established in ten centers spread throughout France. It works in partnership with many other research bodies, local authorities and universities. Within this context, the CEA is a stakeholder in a series of national alliances set up to coordinate French research in energy (ANCRE), life sciences and health (AVIESAN), digital science and technology (ALLISTENE), environmental sciences (AllEnvi) and human and social sciences (ATHENA).

CEA IN FIGURES (2015): 10 research centres; 15 958 technicians, engineers, researchers and staff; 51 joint-research units (UMR); 53 framework agreements with universities and schools; 753 priority patents filed in 2015; 27 Equipex (facilities of excellence); 33 Labex (Laboratories of excellence); 3 Idex (Initiatives of excellence); 187 start-ups since 1972 in the innovative technologies sector; 4,1 billion euros budget; 438 ongoing European projects in 2015

Research Domains:

Nuclear Energy

- Support for the French electro-nuclear park
- New key technologies (reactor-combustion cycle)
- Research on treatment and management of radioactive waste

Industrial Innovation

- New energy technologies: hydrogen, fuel cells, photovoltaics, storage, etc.
- Micro and nanotechnologies: integration of systems and technologies
- New materials and emerging procedures

Defence and Security

- Guarantee of France's deterrence capabilities (digital simulation and experimental validation)
- Embedded design of nuclear boilers
- Fight against terrorism, in nuclear and radiology domains as well as biological and chemical domains, in coordination with the French military (Direction Générale de l'Armement)



Fundamental Research

- Sciences of matter for nuclear energy and innovation
- Use of nuclear technologies for health medical imaging and biotechnologies
- Knowledge of matter: large national and international facilities for analysis

Transfer of Knowledge

- National Institute for Nuclear Sciences and Techniques (INSTN), doctoral level
- Transfer of technologies, expansion and establishment of companies (incubators, start-up funds)

International

On the international level, the CEA's mission is to provide advice to the French government on questions regarding international nuclear policy, to represent France in international nuclear organizations, and to lead and develop cooperations with counterpart organizations in other countries in all of its research domains.

The CEA and the ANSTO have signed a MoU in the field of scientific and technological research: food science, materials science for radioactive waste storage, nuclear medicine.

Collaborations also exist in the field of neutron scattering between CEA and ANSTO.

The CEA has an agreement with The Australian National University, which favors the mobility of PhD students by developing scientific cooperation (PhD co-tutelle).

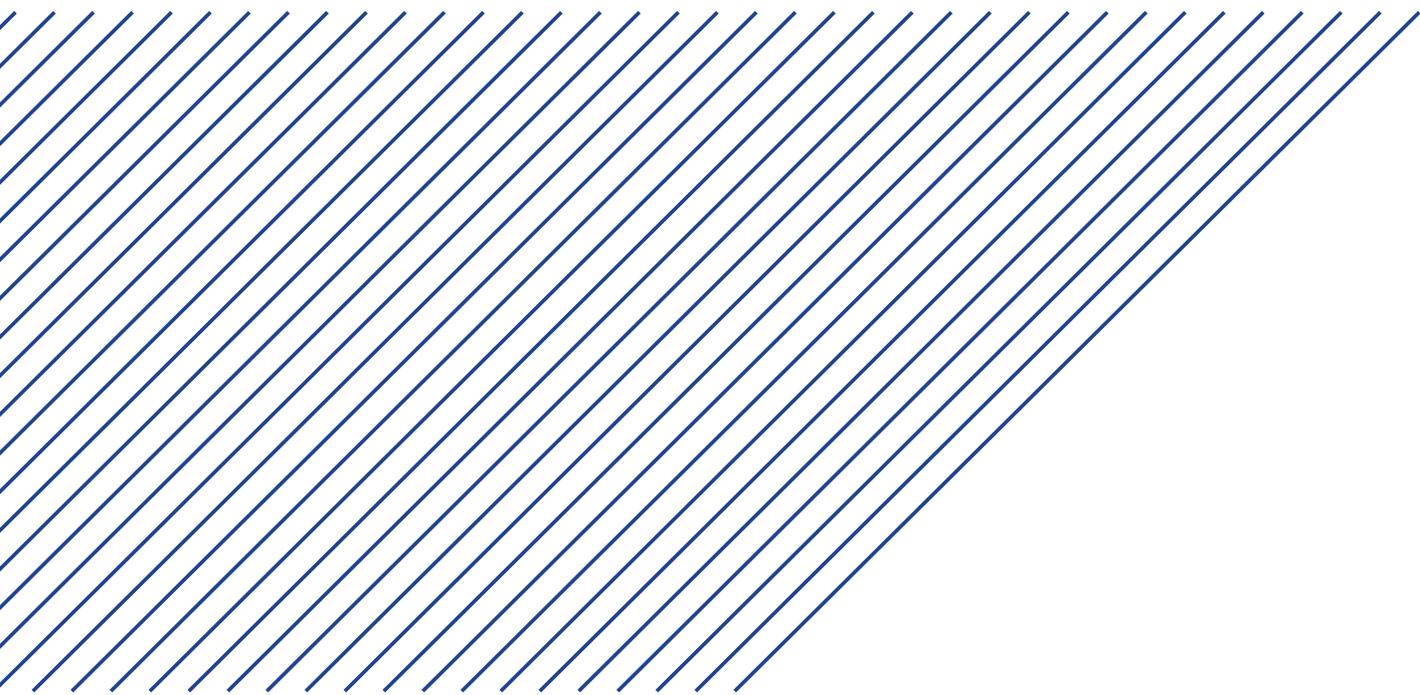
Numbers

The CEA owns 10 research centers across France, 753 new patents in 2015, 4,1 billion euros of budget, and participates in 31 competitiveness clusters.

For more information, visit:

<http://www.cea.fr/english/Pages/cea/the-cea-a-key-player-in-technological-research.aspx>

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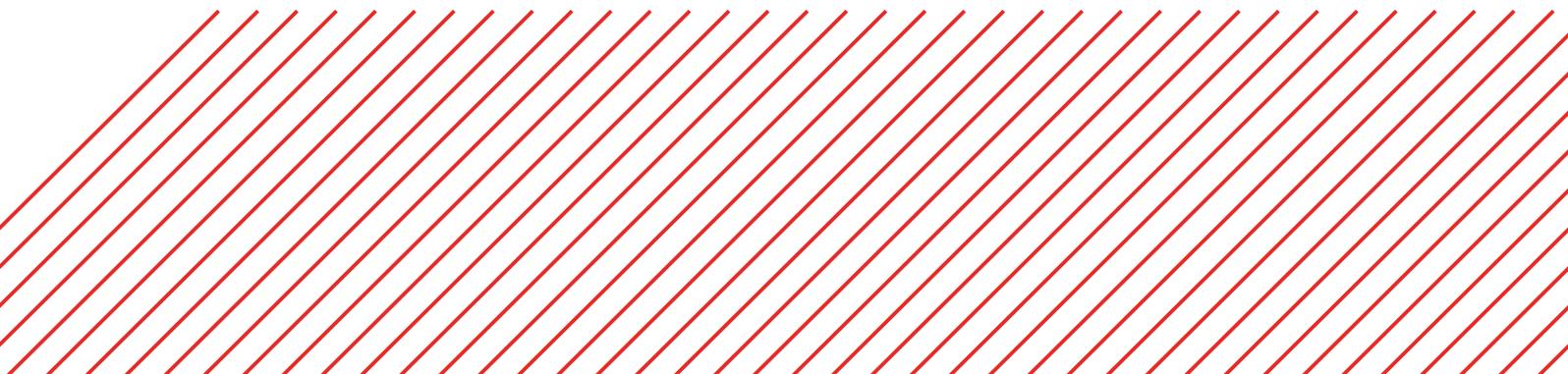
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FRENCH COMPETITIVENESS CLUSTERS

France has a total of **71 Competitiveness clusters**, 17 of them demonstrating effective or potential worldwide attractiveness. Their role is to some extent comparable to that of the **Australian Growth Centers**.

A French Competitiveness cluster brings together large and small firms, research bodies and tertiary education institutions, all working together in a specific region to develop synergies and cooperative efforts around a shared theme. The core activity of the clusters is to develop collaborative innovation projects, while integrating the potential economic benefits as early as possible. Clusters meet two priorities: reinforcing the economic benefits of R&D projects. The clusters become factories for tomorrow's products. They transform collaborative R&D efforts into innovative products, processes and services released onto the market; supporting the growth of SMEs and mid-size companies (ETIs) by offering collective and individual services in the following areas: access to financing, international development, the forecasting of companies' needs in terms of skills, and individual assistance with the development of SMEs, including advice and tutoring.

Role

- Promotion of technological innovation and development
- Creation of jobs and attractiveness to the territory and to reduce relocations
- Increasing the competitive edge of French research
- Clarifying and strengthening French scientific presence on the international scene
- Reinforcing international collaboration and foreign investment

Funding

France and its regions back the development of clusters:

- Through calls for projects launched by the FUI and under the Invest for the Future Programme resulting in financial assistance for the best nation-wide collaborative public-private R&D projects;
- By granting loans to member SMEs or ETIs that wish to embark on the industrialization and marketing of the results of a collaborative R&D project. This loan for the industrialization of cluster projects (PIPC) is financed by the Invest for the Future Program;



- By helping clusters and their member firms find the best international partners and set up technological partnerships with them focused on value creation;
- By supporting the clusters' governance structures, alongside firms. This support enables the introduction of theme-based collective initiatives launched by the clusters, in a wide variety of fields and involving the cluster's firms, particularly including SMEs, so as to promote innovation and improve their competitiveness;
- By relying on various funding partners (ANR, BPI France, CDC, Business France.)

International Collaboration

A number of **European** (Italy, Germany, Sweden) and **international** (US, India, Brazil, Canada, Israel, Mexico, Japan) **partnerships** have been established.

The 17 world-class Centers of Excellence:

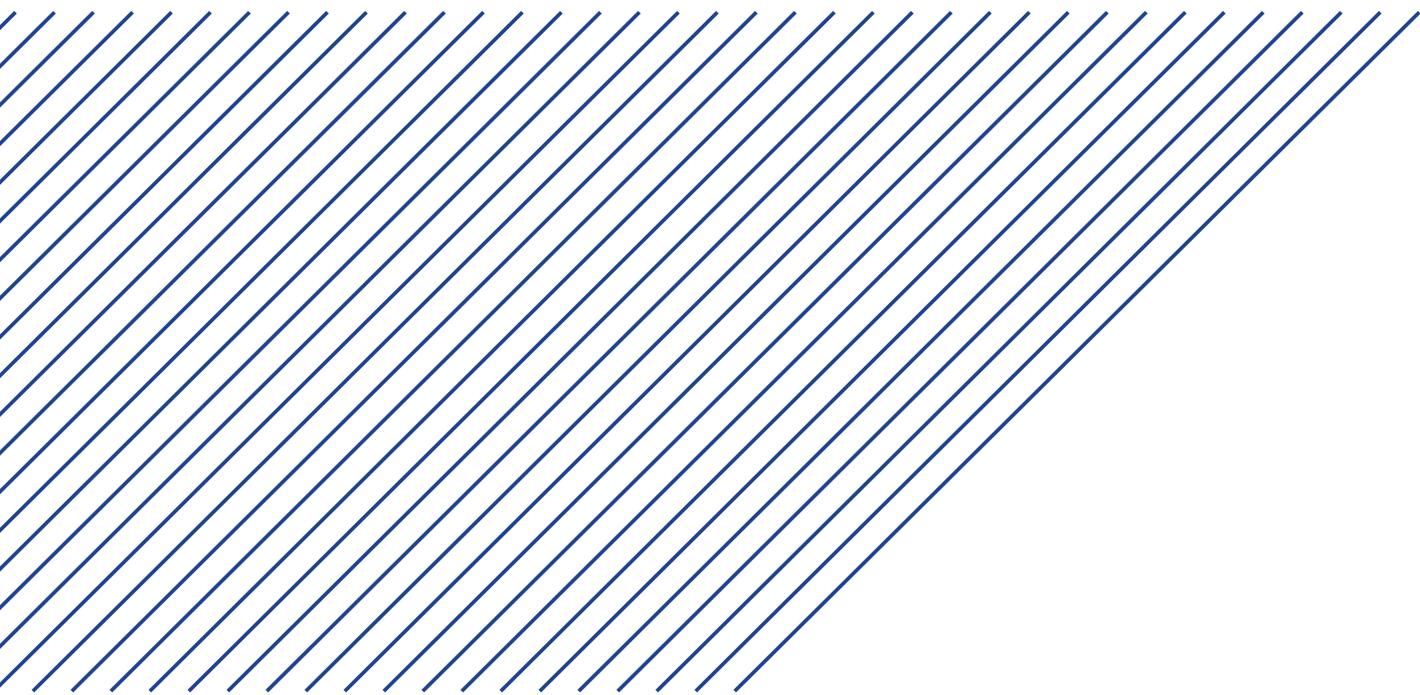
- **Communications:** Solutions communicantes sécurisées, Images & Réseaux
- **Sustainable development and the environment:** Axelera, Industries & Agro-Ressources, Mer Bretagne, Mer PACA, Végépolys
- **Electronics and Computer Science:** Minalogic, System@tic Paris Région, Cap digital Région Paris
- **Finance:** Finance Innovation
- **Transportation and Space:** Aerospace Valley, i-transport, Mov'eo
- **Health:** Lyonbiopôle, Medicen Paris Région, AlsaceBiovalley

For more information, visit:

<http://competitivite.gouv.fr/>

[home-903.html](http://competitivite.gouv.fr/home-903.html)

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