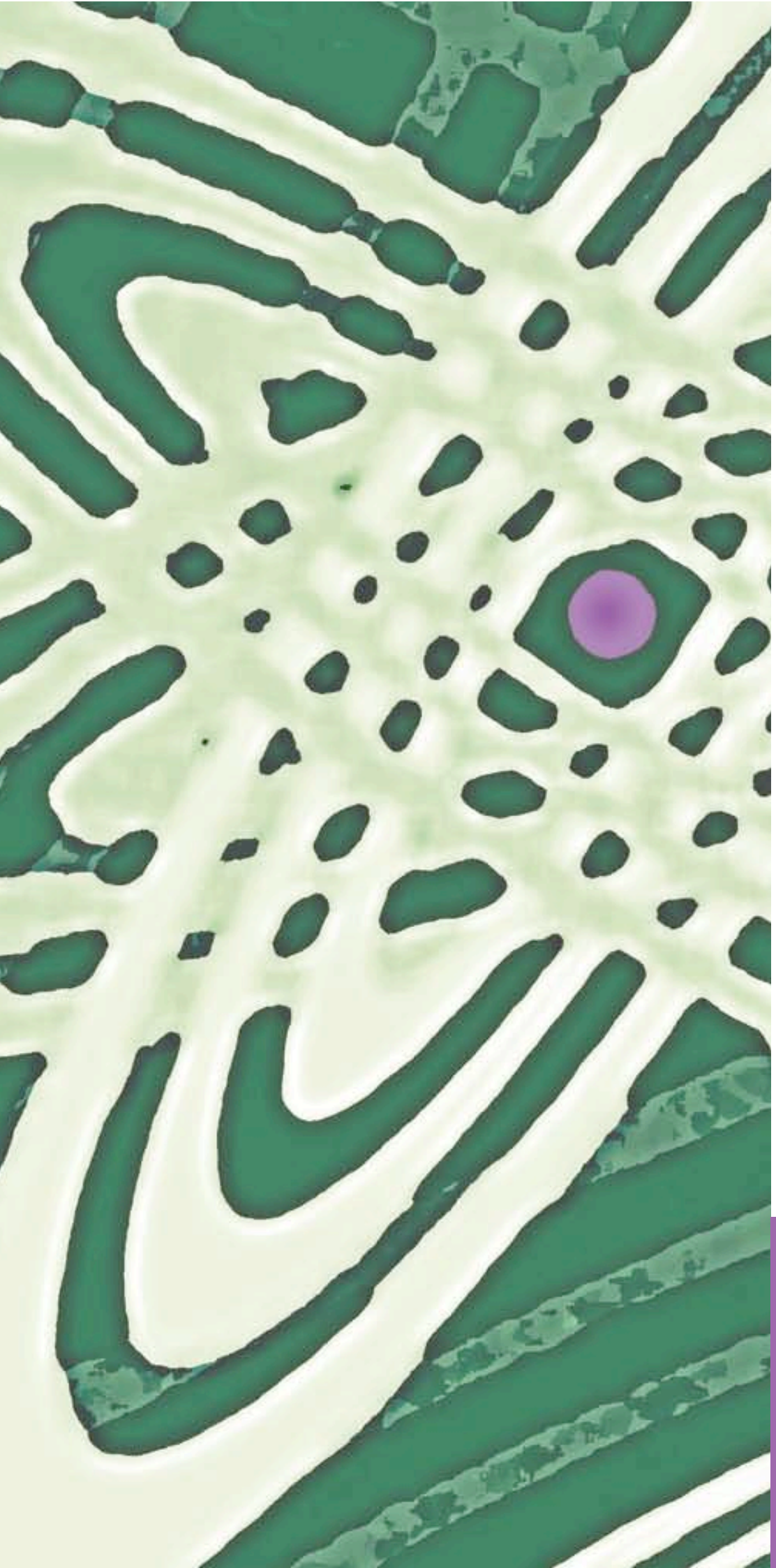


AGENCE NATIONALE DE LA RECHERCHE

ANR

ANNUAL REPORT 2009

SUMMARY

EDITORIAL

2009 has unquestionably been a good year for the French National Research Agency: the strengthening of the principle of project-based financing has been confirmed. Our programming has reached a point of equilibrium that allows both new subjects to emerge and the priorities resulting from societal and economic needs to be taken into account.

The ANR attaches a great deal of importance to fundamental research, which creates the innovation of tomorrow. It is this type of research that enables us to give a real boost to programmes such as those devoted to young researchers and to inciting post doctoral students to come to France, which applies to expatriate French and foreign researchers alike. The need for research that is oriented more directly towards industrial, economic and environmental prospects must not be forgotten however. This work is put into application more quickly and the thematic programmes that foster it represent a large proportion of the partnerships between public research organisations and the protagonists of the industry. These partnerships are not restricted to large organisations, and we are proud to support the research activities of SMEs which, unlike large companies, do not always have the means to implement substantial R&D initiatives.

The agency is also becoming more closely involved in topical issues, with new programmes in areas such as nutrition, sustainable cities, and transport - to name but these - which directly affect the everyday life of our fellow citizens and will have considerable consequences for the future generations.

The ANR is an excellent observatory of trends, and in this respect it has sized up the mindset change in knowledge creation which has led to the social sciences and humanities being given a central position. It is interdisciplinarity that provides for new, richer, and more innovative approaches, which although sometimes disconcerting make science progress more quickly.

During 2009 the ANR stepped up its already numerous collaborations with Germany, the United Kingdom, the USA, Canada, Japan, Austria and Hungary, and also begun new collaborations with high-potential emerging countries such as China and Brazil. It is obviously not a question of standardizing research practices in the different countries, but of combining efficiency, flexibility and responsiveness in an approach that takes the reach of France's R&D over and beyond geographical boundaries.

The annual assessment of the ANR shows that it has undeniably helped forge changes in the research landscape, both nationally and internationally, and it has been able to adapt to these changes. We intend continuing our mission in this manner.

Jacques Stern
Chairman

ANR IN FIGURES

58 calls for proposals

10 transnational joint calls for proposals

6036 proposals submitted

23% average success rate

1334 projects funded

14 430 reviewers

5160 foreign reviewers (i.e. 38.4%)

899 reviewers from industry (i.e. 6.7%)

€650.2 M dedicated to calls
(78.3% of the overall budget)

€487.4 k average grant per project

€167 k average grant per partner

12.2% of budget to private companies

16.8% of budget to university

8% of budget for International cooperation projects

3894 project partners funded

2.9 partners per project on average

38 months: average duration of a project

903 projects funded with a cost higher than €1 M

6578 temporary positions funded,
i.e. 1.65 job on average created per project

WHAT IS THE ANR?

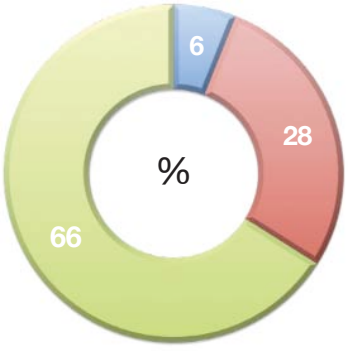
The ANR (French National Research Agency) is a research funding organisation. The ANR was established by the French government in 2005 to fund research projects, based on competitive schemes giving researchers the best opportunities to realize their projects and paving the way for groundbreaking new knowledge.

The role of the Agency is to bring more flexibility to the French research system, foster new dynamics and devise cutting-edge strategies for acquiring new knowledge. By identifying priority areas and fostering public-private collaborations, the ANR also aims at enhancing the general level of competitiveness of both the French research system and the French economy.

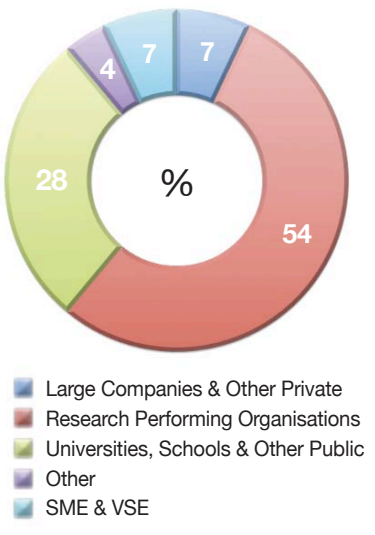
Since its creation, the Agency's budget has been growing, stabilizing at around €820M in 2009. 6036 applications were received and evaluated in 2009, and 1334 of them were funded.

Project-based research funding is well established in many countries where it is known to stimulate research organisations and strengthen their synergies. The ANR's approach to funding allows French research to reinforce its international position and better integrate the framework of European cooperation.

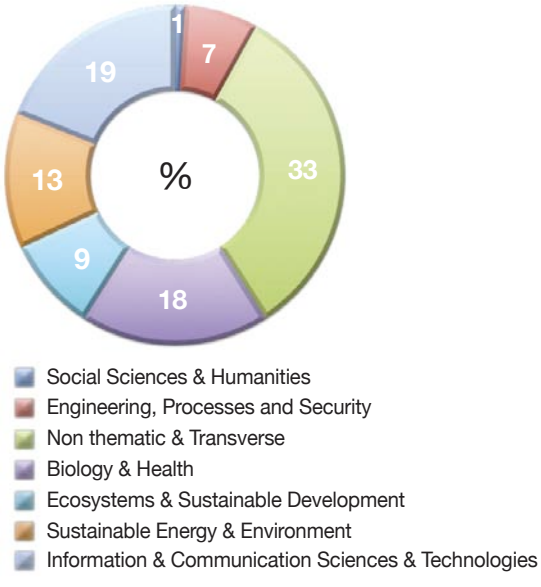
ANR funds are available in all scientific fields, for pre-competitive, fundamental and industrial research and for public research organisations as well as private companies (through public/private partnerships). With a peer review process matching the highest international standards, ANR's general goal is to fund excellent research, while also facilitating innovation and interdisciplinary work and developing European and international collaborations.



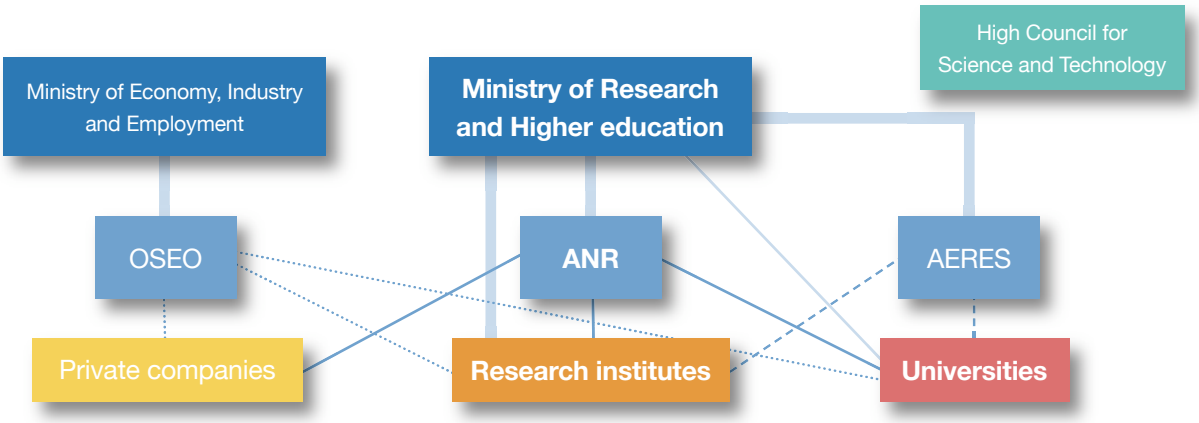
ANR grants per kind of research



ANR grants per kind of beneficiaries



ANR grants per scientific department



ANR in the French research system

ANR is a public funding organisation depending on the Ministry of Higher Education and Research and a key actor in the French research and innovation system. The agency was created within the framework of a larger reform, which also comprised the establishment of the AERES (Agency for the evaluation of research and higher education), whose role, very different from that of the ANR, is to assess French public research units and institutions.
Alongside the ANR and AERES, the High Council for Science and Technology was created in 2006, with a mandate to issue advice and recommendations on the evolution of the French research system.

Organisation and staff

The ANR is located in Paris, with its headquarters in the Gare de Lyon area. In 2010 the Agency opened a second site in the New National Library district to accommodate its continually growing number of collaborators.
The ANR has 110 full-time equivalent staff, plus another 140 full-time equivalent collaborators who are outsourced in several support units. The agency is headed by a Director General, who acts under the supervision of the Governing Board. Nearly half the staff members are scientists.
The typical Programme Director supervising each ANR programme is an active senior scientist often working part time at the ANR for a set time before returning to her / his institution or moving to another one.
The ANR is organised in 8 scientific departments, each with a Head of Department and a number of Programme Directors and Project managers. The agency's Organization chart can be found in the appendix.
6 departments are dedicated to broad scientific areas and priorities. The other two are dedicated to running the agency's non-thematic schemes and to fostering public-private partnerships.
The European and International office works with all the scientific departments.
Administrative services are grouped under the General Secretary to handle all general affairs, legal matters and finance and awards management. It is worth noting that administrative costs are maintained at a very low level at the ANR: they represent just 3.2% of the agency's funding budget in 2009.

Governing Board

Taking all major decisions, the Governing Board's role (GB) is to define the general frame of agency's operations. It is responsible for questions relating to science and research policy, discusses the financial planning for the coming years and adopts the annual budget.
The GB has 10 members and is made up of:

- The chairman of the French High Council of Science & Technology
- Four State representatives:
  - 2 from the Ministry of Research and Higher Education
  - 2 from the Ministry of Finance and Budget
- Five highly qualified scientific personalities. Although no pre-set quota exists for the distribution of seats, efforts are made to split the seats equitably between scientific and academic fields. The Chair is chosen from among the 5 scientific personalities.

Schemes and Programme types

The ANR's core activity is to issue calls for proposals through Programmes. In 2009, 58 calls for proposals were published in all scientific areas. Programmes may consist of a number of calls for proposals, issued within the same year or over a longer period. Typically, a programme will issue calls for 3 years and span a total of up to 8 years, as the projects themselves can last 2 to 4 years.

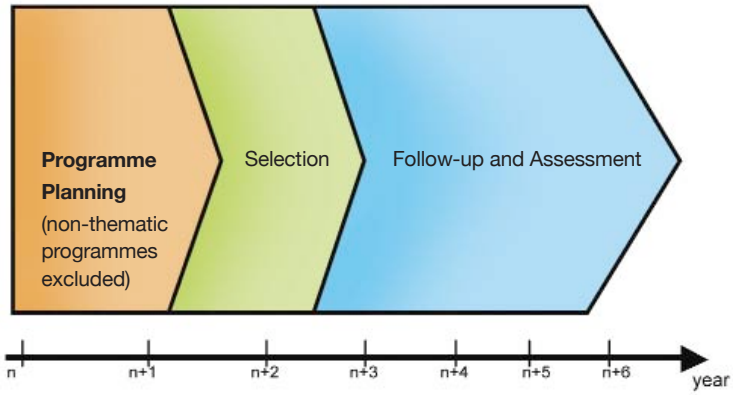
ANR schemes and programmes can be divided along two lines:

- "Thematic programmes" and "Non-thematic programmes",
- "Open" programmes and "Public/Private Partnerships" programmes.

Thematic programmes are the result of a top-down definition process. Responding to economic, environmental and societal demands as well as areas of scientific or technological priority, they accounted for 65% of the agency's grants in 2009.

Non-thematic programmes cater for researchers' creativity through a clear bottom-up process. They account for the other 35% of the agency's grants.

Public private partnerships programmes require at least one partner from each sector, public and private.



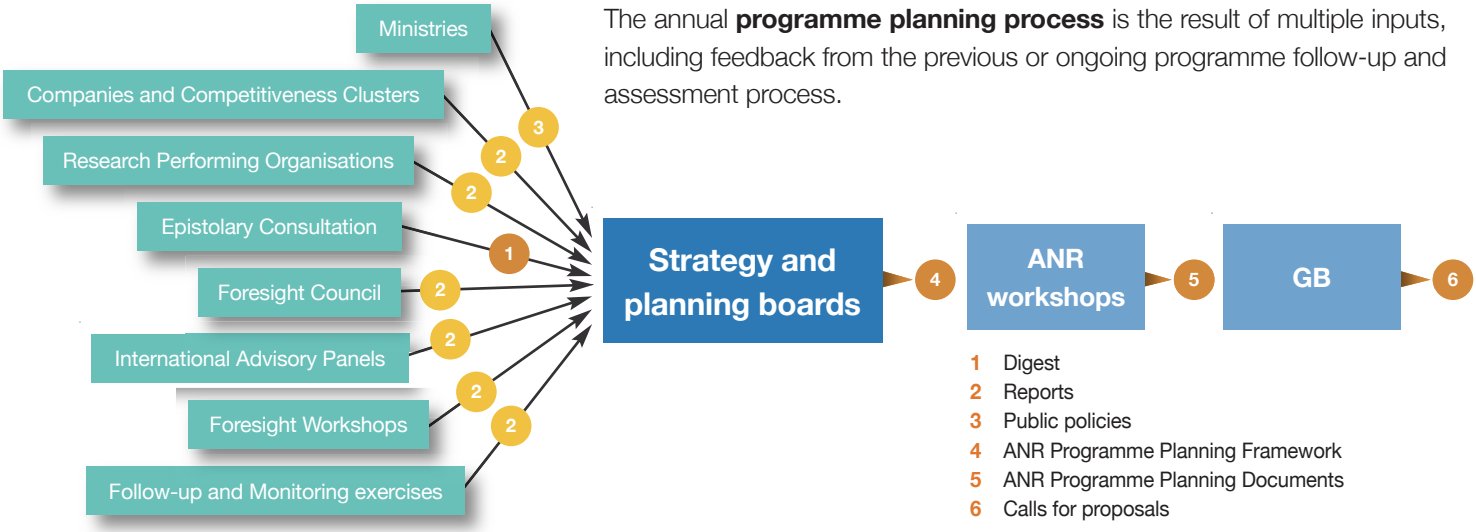
Initiatives carried out by the ANR are organised in three processes:

- **Programme Planning** defining the content of the calls for proposals each year
- **Selection** of projects to be funded through a peer evaluation in accordance with international standards
- **Follow-up and assessment** of funded projects; programme assessment and dissemination of results when projects have ended

Constantly attentive to the scientific community:
ANR programme planning and foresight studies

In order to enrich its portfolio of thematic programmes with the most strategic considerations, ANR implements a continuous foresight and programme planning process in which it consults the widest possible range of national and international stakeholders.

Consulting the scientific community each year on the future needs in both fundamental and applied research is one of the agency's priorities. The ANR's goal is to identify themes which can respond not only to societal, environmental and economic needs, but also to technological and scientific challenges.



The annual **programme planning process** is the result of multiple inputs, including feedback from the previous or ongoing programme follow-up and assessment process.

ANR Foresight Council

The ANR Foresight Council was created in February 2008 and consists of a restricted number of members from a range of sectors with experience in foresight and planning.

The council's objective is to provide a continuous set of guidelines for strategic positioning on the international research and development scene. The council listens to expert testimonies and examines future prospective reports submitted by ANR Strategy and Planning Boards as well as by the Foresight Workshops.

The opinions produced by the Foresight Council help determine the content of ANR programmes over the long term. The Foresight Council meets tri-annually.

ANR Strategy and Planning Boards

ANR's scientific strategy relies on 8 Strategy and Planning Boards involving a total of 201 scientists. Board members are well-known figures in their field and represent all of the major scientific communities (universities, research organisations, industry, and civil society). Public administrators participate as well.

These boards play a key role in defining ANR programme planning through reflection on new programmes, permanent guidance on calls for proposals, or decisions to terminate programmes.

Their reflection is enriched by considering all proposals on new programmes stemming from research stakeholders through an epistolary consultation, as well as advice from the ANR Foresight Council, existing foresight studies, assessments of previous calls, information on the international research scene and the results of Foresight Workshops.

The Strategy and Planning Boards are invaluable as crossroads for discussion on strategies, in particular between private and public sector research.

ANR Foresight Workshops (ARP)

The Foresight Workshops are independent from the calls for proposals and ultimately designed to contribute to the definition of future ANR programmes.

For this purpose, they bring together groups of researchers, experts and representatives from the public and private sectors to identify R&D needs in emerging or transformative scientific areas.

A selection process with

ISO 9001 certification

The keywords here are transparency, equity and quality. ANR processes are based on competitive schemes and a two-stage peer review process which received ISO 9001 certification in 2008. The central element of the review process is the panel. For every call for proposals, ANR nominates a specific panel.

In the first stage, a minimum of two written reviews are obtained from external expert reviewers who are appointed by the panel members. In the second stage, the projects are assessed by the panel, which consists of internationally recognised researchers from the public or private sector, with the highest knowledge of the scientific and technological issues addressed in the programme.

The panel assesses all eligible applications and ranks them in three categories[1]. It recommends a short-list of the most promising applications to the programme Steering Committee, who then proposes a final list of recommended applications to the ANR.

At the end of the process, rejected applicants receive a consensus report for feedback, allowing for constructive enhancements of the projects. ANR publishes the list of all panel members online, but external referees are kept anonymous.

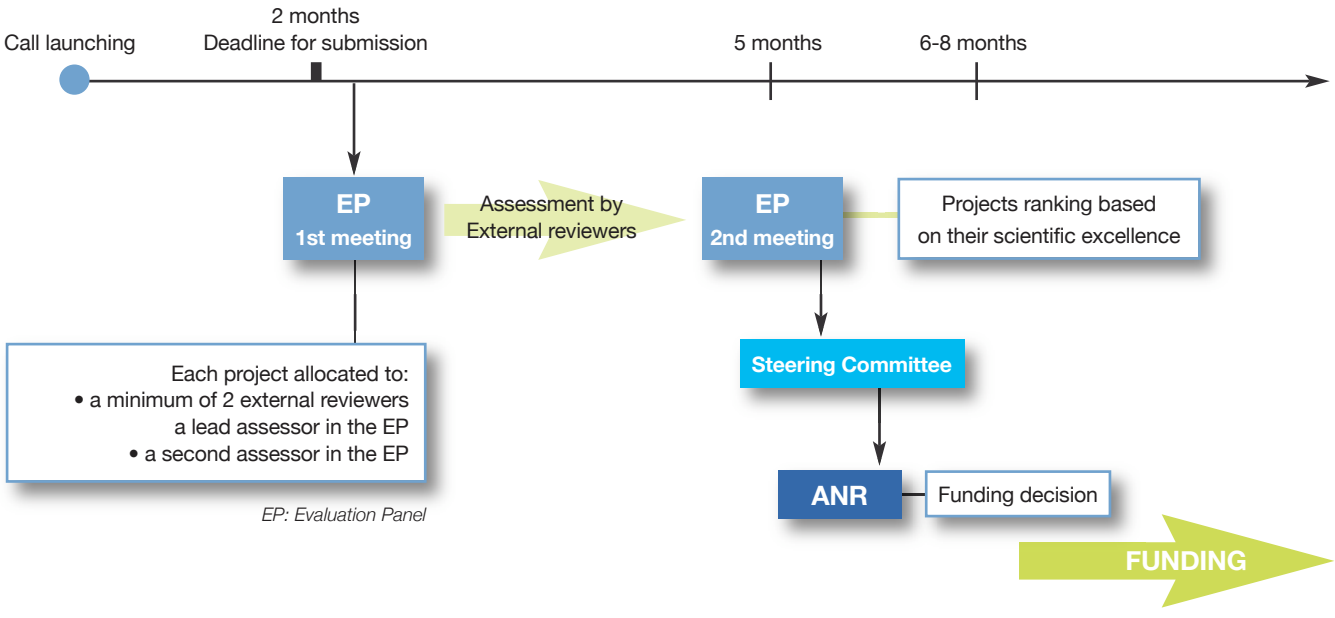
The evaluators in figures

14 430 reviewers involved per year

38.4% foreigners

6.7% industrial experts

The selection process

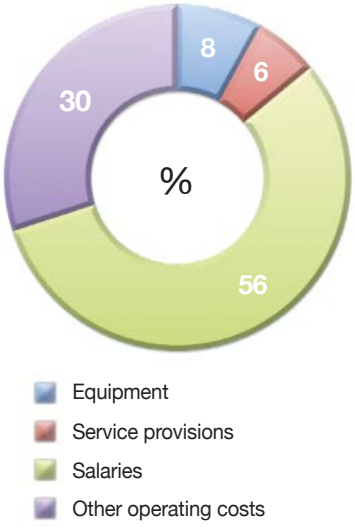


EP: Evaluation Panel

Transparency, equity, efficiency

In 2008, ANR obtained the ISO 9001 certification by AFNOR for its entire selection process. This certification reflects the concerted efforts of the Agency's staff to develop rigorous and optimized working methods.

[1] *Ranking categories: A: Recommended for funding - B: Acceptable - C: Not recommended for funding*



ANR grants per expenditure items

Funding

In most ANR schemes, projects can last 2 to 4 years and the Agency funds either marginal costs or Full Economic Costs (FEC), according to the status of the applicants.
The ANR generally funds marginal costs for public academic institutions, thus covering all expenses necessary for the projects: equipments, travel costs, outsourcing, contracted personnel costs.
ANR grants can be used to fund post-doctoral positions as well as PhD students in most scientific fields. The salaries of researchers or participants with tenured positions are paid directly and independently by their own institutions and are not included in ANR budgets.
For private sector applicants, ANR funds in 'Full Economic Cost mode'. Funds are available to both SMEs and larger companies. The ratio of funding is subject to the applicable rules of the European Union regulations on free competition and State aids.

Follow-up and assessment process

The third pillar of the ANR's activity, along with its planning and selection processes, is the follow-up and assessment process.
All funded projects are carefully monitored during their realization through diverse procedures: intermediate and final reporting, individual review seminars and collective workshops.
When individual projects end, the calls for proposals and programmes themselves are evaluated in the light of their initial objectives. The results of these assessment exercises are ultimately used as feedback for defining new programmes.

International Advisory Panels

Established in 2008, the Advisory Panels consist of prominent international scientific figures, with a majority of Europeans among their members.
Each Panel, working in its specific field of competence, delivers a biennial report on the adequacy of ANR programmes and procedures and produces recommendations for future orientations.
Standing at the crossroads of the programme planning and assessment processes, the international advisory panels' reports are one of several inputs leading to the ANR annual programmes plan.

FOSTERING THE EMERGENCE OF NEW KNOWLEDGE & THE PRODUCTION OF INNOVATIVE CONCEPTS

Non-thematic programmes: supporting curiosity-driven research

4 bottom-up non-thematic programmes provide funding for cutting-edge projects:

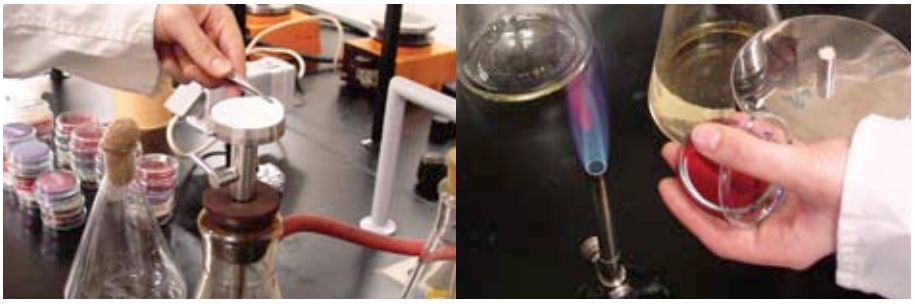
- Blanc Programme
- Young Researchers
- Chairs of Excellence
- Post Doctoral Return

The only rationale that prevails in these programmes is the fostering of excellence and the support given to innovative or interdisciplinary approaches in order to open new paths in research and thus push back the frontiers of knowledge.

The proportion of non-thematic programmes in the ANR programming has never ceased to increase since the agency was created in 2005.

In 2009, the budget for bottom-up programmes increased by 35%. The overall budget for non-thematic programmes amounted to €194.7 M (€210.6 M with international projects), i.e. 35% of the ANR budget dedicated to calls for proposals.

Fostering the production of knowledge and scientific progress in all disciplines is one of the ANR's scientific priorities. It favours a creative environment for researchers by giving them total freedom to define research themes through bottom-up non-thematic calls for proposals, thereby paving the way for advances in S&T and innovative developments. In some specific areas, the ANR launches calls contributing further to advancing the frontiers of knowledge.



Chairs of Excellence Programme

Promoting the attractiveness of France

The hosting of high-level foreign researchers in French laboratories plays a crucial role in enhancing the attractiveness of France in the international context.

The top candidates make their choices according to key factors such as living and working conditions as well as the ready availability of project management resources.

“Chairs of excellence” is a selective ANR programme that provides substantial means for top foreign researchers willing to set up a team and rapidly undertake ambitious research projects in France.

3 types of chairs are available according to project duration and the researcher’s career, whatever his/her nationality or discipline: junior and senior chairs for long duration (36 to 48 months) and senior chairs for a shorter duration (18 to 24 months).

In 2009, more than 20 nationalities were represented among the candidates.

Blanc Programme

Fostering risk taking and audacity in science

- ICT
- Engineering science
- Chemistry
- Physics
- Mathematics and Interactions
- Universe Science and Geoenvironment
- Agronomic and Ecological Sciences
- Biology and Health
- Social Sciences and Humanities

Blanc Programme:
Projects funded per discipline

This 'blue-sky' programme covers the entire research spectrum and gives significant impetus to ambitious projects at the cutting edge of traditional research paths. Researchers from all disciplines can submit a project on any topic they choose. It is open to all types of research: basic, fundamental and applied, as well as to partnerships with industry.

It responds to a certain demand from researchers wishing to have greater freedom in their choice of research subjects.

Expected outcomes from this programme, which encourages interdisciplinary projects, include the emergence of new themes, breakthroughs in the disciplines, new models and methods, not to mention numerous potential spin-offs in terms of innovation.

It is the ANR's most important programme in terms of both numbers of projects selected and funding. In 2009, 1636 projects were submitted, of which 371 were funded for a total sum of €148.5 M.

Project

ARCOR

Multisecular corrosion of complex ferrous systems (mechanisms, modelling, forecasting): use of 'archaeological analogues' (Blanc Programme 2006)

The need to predict the corrosion behaviour of materials over the very long term (centuries) is of primary importance in several fields, including patrimony or the nuclear industry, in particular for iron alloys for which we cannot predict the corrosion behaviour over more than 10 years.

The project is based on a global approach (characterization, corrosion mechanisms and numerical modelling) on the only systems able to provide multisecular thick layers: archaeological objects. It is focused on aspects relating to the determining of the corrosion mechanisms of iron over centuries in different environments (soil, atmosphere, concrete and marine environment), in order to diagnose and anticipate corrosion.

Applications are multiple, e.g. patrimony (museums, historical monuments, on-site preservation), nuclear industry (stocking and storage of radioactive waste, building structures). Samples from the Amiens cathedral and other buildings were studied in detail by combining different techniques (microscopy SEM-EDS, Raman micro spectroscopy, micro diffraction, micro fluorescence and X-ray micro spectroscopy). Corrosion mechanisms were thus identified and localised, identifying the chemical behaviour of iron on the atomic scale and highlighting extremely reactive phases controlling the mechanisms of corrosion.

For further information: philippe.dillmann@cea.fr

Post-Doctoral Return Programme

Avoiding the brain drain and supporting the return and integration of young researchers

A post doc stay abroad is a milestone in a young researcher's career. Young researchers - especially PhDs - can decide to work abroad for various reasons, such as the desire to discover other scientific cultures and research models or to acquire a different and complementary training.

However, the return (of either French researchers or foreign researchers who defended their PhD in France) is crucial in order to develop research initiatives for the future and to consolidate targeted initiatives undertaken with foreign countries. Measures are needed also to prevent the 'brain drain'.

The ANR encourages young researchers who have already proved their strong scientific qualities to pursue a career of excellence on the French territory. This programme is an instrument to promote the return and integration of high-level young French researchers who have already had a post-doctoral stay abroad in higher education and research organisations or industrial research clusters.

Successful candidates from all scientific disciplines are offered the appropriate means to continue their research project on the national territory for a maximum period of three years.

The expected impact of such an initiative is twofold: firstly to increase the number of post-doctoral researchers and benefit from the excellence of their training and experience, and secondly to increase the number of PhDs eager to visit foreign laboratories by facilitating their subsequent return.

MASED

Project

Random walk and discrete-event systems (Young Researchers Programme 2006)

This project focuses on the pluri-disciplinary issue of optimising discrete and possibly random systems, at the crossroads between theoretical informatics and mathematics.

This study is original in that it associates two distinct domains - namely discrete-event systems and random walk - on discrete algebraic structures.

Random walks are studied through theoretical informatics tools while new mathematic models of discrete-event systems are studied on the basis of random walk mechanisms.

For further information: mairesse@liafa.jussieu.fr

Young Researchers Programme

Encouraging autonomy and innovative initiatives

The ANR intends promoting the scientists aged under 39 and helping them develop their own research themes, set up or consolidate research teams and give them the opportunity to rapidly express innovative initiatives by giving them strong support.

The Young Researchers Programme can also be considered as a stepping stone for young French researchers applying to the ERC (European Research Council) starting grants programme.

Ideally, this programme should help create a reservoir of young top quality researchers while positioning them in the international competitions.

Project

ALLOMERUS/ COSY

Molecular and chemical ecology of a compulsory tripartite association plant/ant/fungus. / The dynamics of co-evolution: the case of plants/ants symbiosis (Young Researchers Programme 2006)

These two complementary projects address the issue of symbiosis between plants and ants. Both are based on a multi-disciplinary approach including the use of standard observation methods, antenna nerve impulse measuring techniques, molecular biology, chemical ecology, radioactive marking and electron microscopy.

Results show that ants can practise both alimentary (CoSy) and non alimentary (elaboration of traps, Allomerus) agriculture, which is unique in the animal kingdom, mankind excluded. New knowledge is also provided on communication evolution mechanisms, as well as original data paving the way for new research.

For further information: Allomerus: orivel@cict.fr / CoSy:rumsais.blatrix@cefe.cnrs.fr

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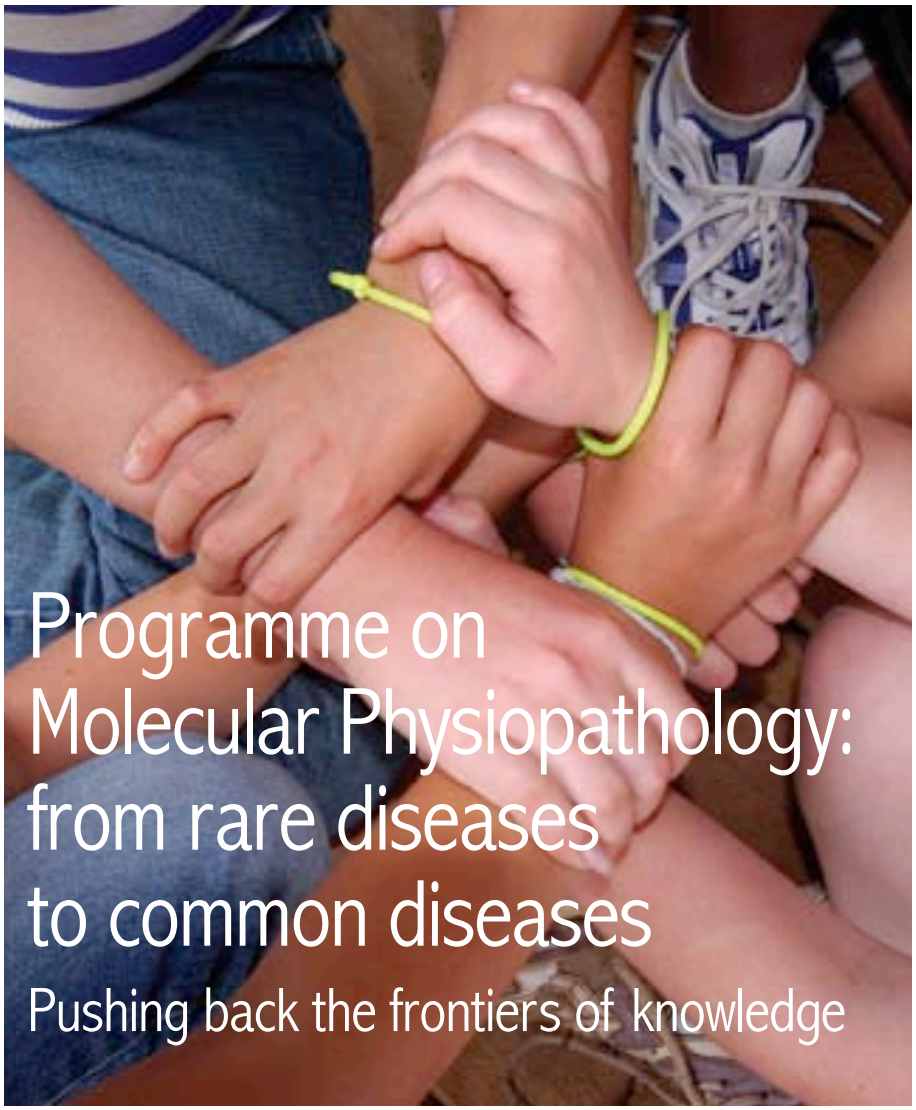

Programme on Molecular Physiopathology: from rare diseases to common diseases

Pushing back the frontiers of knowledge

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Good quality medical care depends on having a clear understanding of the diseases and more particularly of the physiopathological mechanisms behind the diseases. The physiopathology of human diseases - whether rare or common - is usually complex because of their genetic, molecular or cellular bases - which are often multifactorial - and due to their development through different tissues or organs.

Finding or improving treatments as well as optimising disease care are primarily societal issues. Cardiovascular diseases represent half the causes of death in Europe. Moreover, the morbimortality related to diabetes and to the increasing incidence of obesity demonstrate the urgent need to develop innovating diagnostic and therapeutic tools which cannot be achieved without progress in fundamental research. Each of the rare diseases is also a major public health issue. The elucidation of their physiopathological mechanisms can bring a unique perspective of normal and pathological human biology.

The aim of this programme is to study the physiopathology of rare or common diseases (apart from cancer, infectious and nervous system diseases) and boost research efforts to gain a better understanding of their mechanisms.

It is hoped that the programme will result in enhanced knowledge as well as new tools for prevention, early diagnosis and more effective therapeutic approaches.

FUNDING RESEARCH RESPONDING TO SOCIETAL CHALLENGES

Advances in science and technology are often closely interconnected with major social issues and are therefore often analysed in the light of their societal implications. The ANR directly addresses a number of societal issues in programmes that intend to provide scientific and technological responses to burning societal questions, such as security, social well-being, sanitation, pandemics and human health, nutrition, etc. These programmes stimulate research that is in line with major social demands (e.g. greater focus on rare diseases), social evolutions or lifestyle changes (ageing and increasing population), and global social concerns (need for security, etc.).

Project

Images at the fingertips: the blind child, family, school and illustrated tactile books

(Children and Childhood 2009 Programme)

This project aims at studying, from an interdisciplinary point of view, the complex relationships that link the blind child to the illustrated tactile book.

Fundamentally, the scope of the project consists in providing new findings in relation to how cognition develops in blind children, and consequently, to how cognition and visual perception relate one to the other, as well as to the role played by human interactions in these cognition-visual perception relations. The possible existence of a genuine "tactile language" will also be investigated in this project.

In a more applied perspective, the final objective of this project consists in using all the relevant results to conceptualize and produce one (or more) illustrated tactile book(s).

For further information: annie.vinter@u-bourgogne.fr

Children and Childhood Programme

Children are at the heart of many diverse and sometimes contradictory societal issues, especially due to the rapid changes of the groups and institutions in which they evolve.

The aim of this programme is to promote the development of research endeavours related to children and childhood (in the broad sense), in the different dimensions of social sciences and humanities (comparative (diachronic or spatial), or pluri-disciplinary approach).

Its impact is important for society: the status of children in society affects the political sphere through the question of citizenship and children's participation in decision making; the protection of children against any forms of ill-treatment and the issues of exploitation and traffics; the position of children within the family sphere as well as legal, educational and sanitary dimensions are also at stake. Each response says something about the choices made by a society.

Project

BINGO

Bricks for an Operational Neutron and Gamma Imaging (Global Security Programme 2007)

This project focuses on the nuclear, radiological, chemical, or enhanced explosives terrorist threat. Its aim is to develop the technological bricks necessary for the production of portable equipment for detecting hazardous materials inside packages without manipulating them.

The neutron analysis provides a 3D image of the material without coming into contact with the examined package.

It is thus possible to determine whether unattended luggage contains hazardous material or not (explosive, chemical, toxic, or radiological), whereas this kind of information cannot be obtained from more traditional X-ray based systems. The numerous applications include drug detection by Customs services.

For further information:
Isabelle.lefesvre@sodern.fr

Concepts, Systems and Tools for Global Security Programme

Security has become a fundamental concern of our societies.

This programme is in line with the national priorities in this respect and with the European Union's objective to ensure security of goods and people in an Area of Freedom and Justice.

It contributes to the emergence of innovative solutions for security-related issues such as protection of citizens, protection of living and network infrastructures (transport, energy, and information), security of frontiers and flow of goods and services, crisis management.

It encourages research efforts devoted to a better understanding of the organisational, social, cultural, economic, legal and/or technological issues raised by security, and/or to demonstrating the feasibility of systems, methods and tools.

AAL
AMBIENT ASSISTED LIVING

Transnational Programme on Ambient Assisted Living

ICT at the service of ageing and autonomy

Population ageing is a trend throughout Europe and has obvious consequences affecting all levels of society: it is a challenge to the health systems, employment and market opportunities, and raises questions in terms of intergenerational solidarity and pension models, consumers' practices, etc.

Negative effects of such a situation can find remedies in the development of appropriate policies but also in the development of new forms of aid. It therefore constitutes an opportunity for innovative technologies, products and services responding to the specific impairments and needs of elderly people.

This programme contributes to the development and use of information and communication technologies to improve elderly people's quality of life, autonomy, health and care services and to extend the time they can live in their home environment.

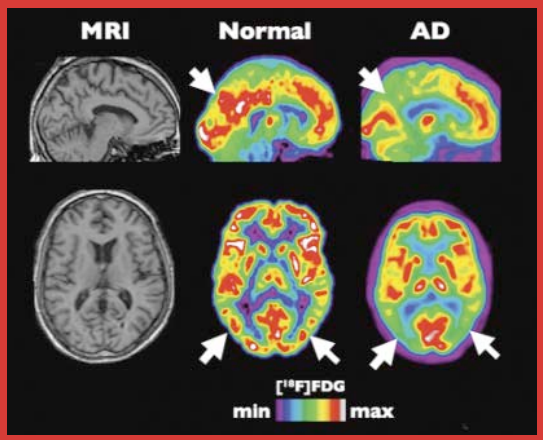
Natural Hazards Programme
Understanding and Controlling

Natural hazards have always affected societies. There are countless recent examples of the recurrence and scale of natural hazards. The increasing urbanisation of the planet and the sophistication of society explain why human and economic costs further to natural catastrophes are rising.

This programme aims to fund research targeting the reduction of all the impacts of rapidly occurring natural hazards, whether hydrometeorological (flooding and torrential floods; avalanches and ice risks; storms; hurricanes and cyclones; etc.) or telluric (earthquakes; volcanoes; tsunamis; etc.). All issues (physical processes, human, social, political and economical) are considered.

The programme takes into account all the research aspects (evaluation, prevention, reduction, reparation or resilience) necessary to optimize risk management in the short, medium and long terms.

Neurological and Psychiatric Diseases Programme



Neurological and mental diseases constitute an important medical and societal issue and are a real matter of concern for the general public. These diseases and deficiencies are increasing with population ageing.

By 2020, 1 million people in France could be affected by degenerative disorders such as Alzheimer's disease.

Consequently it is essential to better understand the fundamental and medical aspects of the damage to the nervous system, be it common or rare.

The main purpose of this call is to boost research efforts in an area which remains essential for human health and social integration of individuals.

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FUNDING RESEARCH AD & GREEN

Project

SHAMASH

Biofuel production from autotrophic algae (Bioenergies Programme 2006)

Some microalgae species can accumulate biolipids representing up to 60% of their dry weight. Considering their high rate of growth, their productivity could be 30 times higher than that of rapeseed crops.

The predicted yields and advantages of this new process make microalgae a potentially feasible alternative to other plant resources for the production of biofuels. The goal is to explore this potential through a multidisciplinary approach: studies of lipid metabolism, research of species, optimum growth conditions, lipid extraction, and process engineering.

Three species were selected from some one hundred species studied. A cycle of selection/mutation (on isochrysis galbana) allowed a gain of productivity of about 300% to be achieved.

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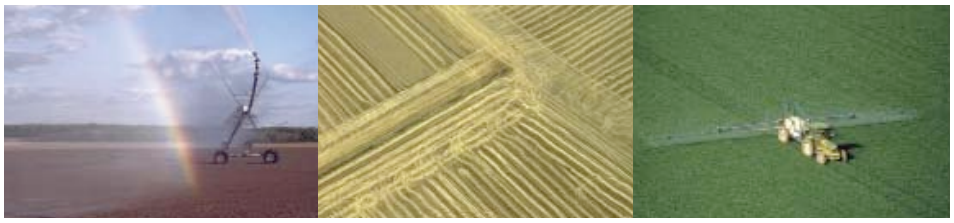
ANR programmes give high priority to the issues raised by the "Grenelle de l'Environnement" (French National Environment Round-table), with the result that the agency is now a major actor in funding environment-oriented projects. Many programmes are partly or entirely oriented towards finding solutions to environmental issues, covering a wide spectrum of domains and key challenges such as loss of ecosystems and biodiversity; low carbon energy and greenhouse effect; global change; energy efficiency and energy savings in buildings and transport; renewable energies and pollution, etc.



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Ecosystems, Territories, Living Resources and Agriculture Programme

The progress of human societies in the biosphere shows that ecosystems have been deeply modified by agriculture and fishing, and will continue to be modified by future demographic pressure.

Ecosystems are facing a global ecological crisis, where economic activities using ecosystems and territories (i.e. 'ecocultures') can play a key role, by either amplifying the problems or helping resolve them.

The aim of this programme is to ensure that agricultural production meets the needs of populations, while remaining in line with sustainable development. It focuses on the ecological functionalities of agriculture, forestry and fishing – which form the so-called 'ecocultures'.

The programme fosters the development of a new wave of 'ecologically intensive' technologies and methods allowing more sustainable management of the factors that govern agricultural productivity, e.g. biological quality of soils, genetic patrimony of species, sustainable management of water resources, etc.

DRESSING ENVIRONMENTAL ISSUES TECHNOLOGIES

Bioenergies Programme

Developing bioenergies contributes to sustainable development by fostering independence with respect to fossil fuels and protecting the environment, developing new opportunities for agriculture and forests, and promoting renewable energies.

Biomass is one of the major sources of renewable energy in France, where the substantial reserves offer high potential.

This programme aims to improve the mobilisation of resources and the energetic valorisation of all the biomass components, in particular by using thermochemical and biotechnological processes to develop gaseous biocombustibles and biofuels of the 2nd generation (bioethanol and biogas) and 3rd generation (biohydrogen and biolipids).

REDUGES

Project

Reduction of greenhouse gases in electric applications: SF6 gas (Ecotechnologies and Sustainable Development Programme 2006)

Fluorocarbon gases, especially SF6, have a very strong greenhouse capacity (24,000 times the capacity of CO_2).

The EU regulation has banned the use of SF6 in all applications since 2008, therefore it has been necessary to find substitutes.

This project aimed at replacing SF6 by other substances in electric and power transmission equipment. It resulted in the development of a dielectric insulation system based on vegetable oils, which enables electric switch systems to be insulated for a significantly lower cost than with alternative products available on the market.

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The 6th Extinction Programme: Quantifying Loss of Biodiversity – Understanding and Acting on Biological, Economic and Social Processes

Due to the human action on ecosystems, a 6th extinction of species is currently being observed around the world. This phenomenon is accompanied by a loss of biodiversity at many levels: depletion of the gene pool of surviving species; loss of functions essential to ecosystem durability, etc.

The programme aims to improve knowledge on the factors leading to a loss of biodiversity and its consequences on both the functioning of ecosystems and socio-economic developments. The results could be used to build a database in the framework of orientation strategies for sustainable development of human activities.

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Smart Building and Solar Photovoltaic Programme

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Energy efficiency in the building sector is the key to reducing energy consumption, for both the construction and energy industries and the end-users through reduced energy bills. The French government has set very ambitious targets for the building sector in terms of energy savings and integration of renewable energies.

The programme focuses on smart energy management, and aims to bring together the scientific community and industry through three complementary approaches, namely integrating global technological solutions that bring energy savings, using renewable energies, and certifying usability, safety and user's health.

The programme aims at developing cutting-edge technological solutions to radically reduce energy consumption in new and existing buildings, as well as the recycling of used materials, avoiding the use of products that will be prohibited in future regulations (REACH, etc.), and developing photovoltaic production.

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Sustainable Chemistry and Processes Programme

Sustainable Production

and Environmental Technologies Programme

The aim of this programme is to reinforce research endeavours in eco-technologies in France, develop innovation in eco-industries and significantly reduce the environmental impact of industrial activities.

It focuses on developing technologies, tools and services that could foster innovation in terms of sustainable industrial production and eco-industries, i.e. an industry providing goods, services and equipment while protecting the environment by reducing greenhouse gas emissions, industrial and urban waste, effluent, and the consumption of non-renewable resources and raw materials, and by substituting polluting substances.

ENERPOS

Project

Development of new modelling and design methods for positive-energy buildings under tropical climates (Energy and Buildings Programme 2006)

The aim is to develop new methods and calculation tools for the design of positive-energy buildings in hot tropical climates and to support the transfer of the acquired knowledge to - and its application in - professional practices.

The methods and tools developed were applied to the design of the first energy-positive building in the French overseas region. The demonstration building consumes 7 times less energy than a similar standard building and does not require air conditioning. ENERPOS is now a reference building for tropical climate standards.

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Chemistry plays a fundamental part in the improvement of living conditions. Nowadays it must therefore be effective at promoting sustainable development.

The "Grenelle de l'Environnement" proposed initiatives in favour of the transformation of the chemical industry, such as reducing greenhouse gas emissions, increasing the proportion of renewable materials from 7 to 15% by 2017. "Eco-efficiency" should be replaced by "eco-design", where environmental parameters are taken into account from the beginning of product design.

The program focuses on the optimizing of existing processes and the development of new synthesis strategies aiming at reducing waste production, by encouraging chemists to think differently.

Project

POLARAMAN

Development of a Polarimetric nano Raman spectrometer and its application to the characterization of nanostructures (PNano Programme 2006)

This project aims at developing an innovative nanomaterials characterization tool: the polarimetric nano Raman spectrometer.

The combination of three aspects (Raman spectroscopy, near-field optical measurements and polarization control) provides a powerful measurement tool on the nanometric scale.

This new characterisation method and tool allows, among other things, the measurement of internal stresses in microelectronic circuits and the structural analysis of carbon nanotubes, and is very well suited to the characterisation of ordered organic structures.

The industrial partner in the project will develop the innovative optical spectrometer, thus providing a tool necessary for the development of nanotechnologies.

ENCOURAGING RESEARC TO ECONOMIC & COMP

Scientific and technological breakthroughs play a key role in terms of modernisation or economic growth and gains in productivity in developed and emerging countries. This is especially the case for rapidly growing or evolving fields such as biotechnologies, nanotechnologies (e.g. nano-products coming to market, emergence of nanoelectronics, etc.), and ICT (massive diffusion of embedded systems, Internet, dematerialisation and digitisation of information). ANR promotes research programmes in all fields representing a driving force for productivity, employment and competitiveness (transfer of knowledge, partnerships between industry and academics) and having a real leverage effect in terms of technological and industrial development, patenting, start-ups and SME creation.

Health Biotechnology Programme

At global level, health biotechnology constitutes a rapidly growing economic sector, now competing with the chemical and pharmaceutical industries. The development of biotechnology industries represents a major stake in terms of intellectual and industrial property and economic growth.

This programme aims at funding projects stemming from high tech SMEs in the field of health biotechnology, exploiting results of leading-edge science and technology in order to develop new therapeutic, prevention and diagnosis products, and improve productivity while reducing harmful impacts on the environment.

H ENDEAVOURS RESPONDING ETITIVENESS CHALLENGES

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Content and Interactions Programme

The evolution towards universal digital content demands new capacities for handling complex and heterogeneous data in a dematerialized way: images, videos, voice, music, and web data.

The creation of digital content is marked by increasingly massive recourse to synthesis and special effects, and by the complexity of content in terms of computation, data to manage and animation engines. A second major change concerns the increased needs for processing, mining, indexing and managing multimedia databases, and of knowledge or usage traces. The multiplication of sensorial accesses, increasingly dense cognitive demands, and the growing needs for cooperation span a very wide field covering ambient environments, man-machine interfaces, and robotics in their perceptual and cognitive aspects.

Lastly, the multiform development of social networks combined with mono or multi-personalized localized uses poses problems of behaviour, practice and exchange that have to be mastered.

The aim of this programme is to foster collaborative multidisciplinary research projects targeting various communities, create knowledge and transfer it to industry.

PROSIT

Project

Robotic Platform for an Interactive Tele-echography System (Content and Interactions Programme 2008)

The project aims to develop a light-weight and dedicated multi- DOF (degrees of freedom) robotic system usable for a tele-echography diagnostic application.

The aims are to characterize and integrate a master-slave platform dedicated to a medical ultrasound application, and to provide the end-users with interactive functions for full deployment of the robotised tele-echography service throughout the medical national and international networks.

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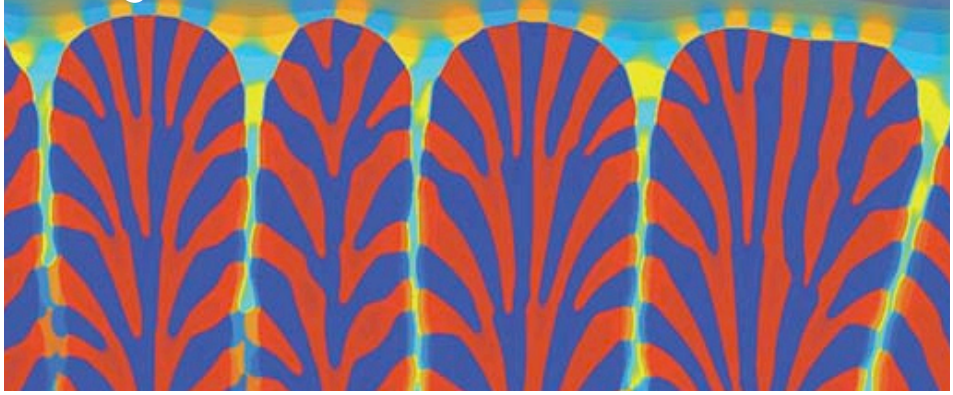
Functional Materials and Innovative Processes Programme



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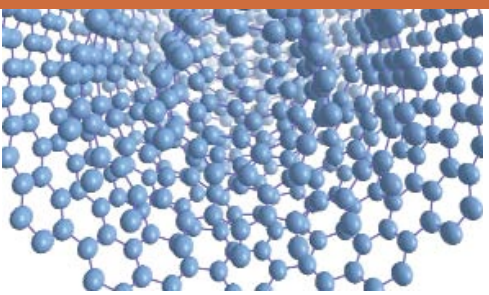
This programme intends to rally scientific actors in various fields such as chemistry, mechanics, physics, materials science and mathematics around the common objective of developing materials responding to societal (health, security, comfort), sustainable development (recycling, climate change) and extreme performance needs.

Materials and associated processes exist in almost all traditional and innovative sectors. The aim is to facilitate knowledge transfer between the worlds of research and industry and to support innovative SMEs. Improving industrial knowledge in the field of materials and design processes could enhance their skills and competitiveness.

Functional materials are also a significant asset for the development of SMEs in niche sectors.

Nanoscience, Nanotechnologies and Nanosystems Progr



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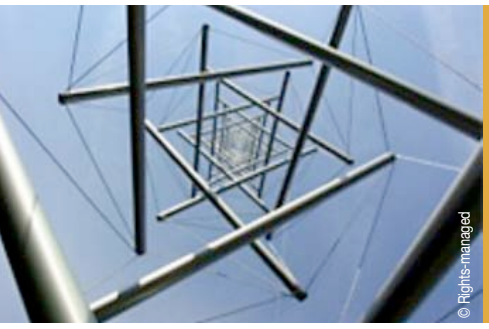
Nanoscience and nanotechnologies are a rapidly growing sector in terms of publications and patents but also in terms of R&D investments and incentives.

Scientific and technological advances of the past decade are now reaching many key sectors such as building, mechanics, textile, communications, aeronautics and space, sustainable energy, health and electronics.

They also represent a fantastic opportunity for tackling present and future economic challenges.



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Embedded Systems and Large Scale Infra

This programme supports projects for developing specific technological bricks in the areas of embedded and large scale systems, sensors and control architectures, safety and security of information systems, and software engineering.

Ground Transportation Programme

The aim of this programme is to reduce the environmental impacts of transports while optimizing their environmental efficiency, safety, and reliability.
All ground transportation modes are concerned, i.e. road and rail and all their applications (individuals, professionals, passengers and goods).
The focus is both on the energetic efficiency of vehicles by reducing emissions around the vehicle's structures, and on the efficiency of transports systems and increasing their productivity.
Economic stakes are high: transportation is the leading employment sector in France, while vehicles and fuels represent major household expenditure, and the development of technologies respecting environmental standards leads to strong industrial competition.

amme

This programme focuses on five strategic objectives hinged around nanoscience and nanotechnologies: exploring and exploiting the remarkable properties of materials on the nanometre scale; designing and developing technological processes; exploring the concept of micro- and nanosystems for applications with a strong impact in the area of health and environment; improving the transfer from fundamental to industrial research; and fostering the sustainable development of nanoscience.

structures Programme

In these domains it is necessary to maintain and develop a strong capacity for innovation and leadership. Controlling these 'core technologies' is vital for the competitiveness of ICT industries and all their application sectors.

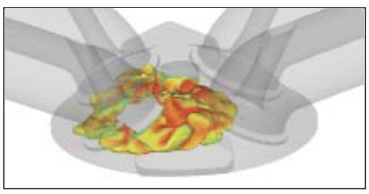
SGEMAC

Project

Development of a methodology based on a large scale simulation for the prediction of cyclic variations in spark-ignition engines (Ground Transportation Programme 2006)

Cyclic variations significantly impact pollutant formation and the energy performance of spark-ignition engines. Providing simulation tools for predicting these variations is crucial to the production of clean and highly-performing engines.
The project aims at developing a cutting-edge methodology based on a large scale simulation. It implements a highly detailed experimental database supporting the validation of calculation methodologies developed in the project. This database is designed especially to validate numerical simulations. It uses optical diagnosis to obtain complete data on physical parameters of the combustion chamber. The first results show that the large scale methodology allows accurate reproduction of the engine acoustics and the cycle-to-cycle variability of combustion, down to the structure of combustion.

For further information: christian.angelberger@ifp.fr



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PROMOTING INTERDISCI

Some issues due to their nature, their causes or their impact, involve several different sectors and can only be resolved through an interdisciplinary approach. One of the goals of the ANR is to encourage research responding to cross-discipline and often cross-border issues by implementing programmes that bring together teams from different sectors. Those programmes foster cross-disciplinary research efforts in various fields such as sustainable cities, global changes, contaminants and health, human memory, mathematics or the issue of science and society.

Project

Gephama

From advertisement to marketing: Pharmaceutical enterprises, patient, physicians and the construction of medical markets (ANR-DFG call in social sciences and humanities 2008)

The project aims to analyse the marketing of modern drugs as an approach for understanding the modern medical market.

The industrial mass production, the use of communications media in marketing, the specialization and internationalization of and the differentiation within the medical market (inpatient or outpatient treatment), and the promises of the post World War II "therapeutic revolution": all these trends have allowed for the evolution of an ever more complex network of actors, interests, and power structures.

Focusing on the 20th century the project is conceived as a comparative study between France and West Germany, as an "histoire croisée" (entangled history) which examines comparable and internationally overlapping events (new drugs) or developments (scientific marketing) and their own specific national effect. Which answers were found in each country-specific research, business, law and social systems?

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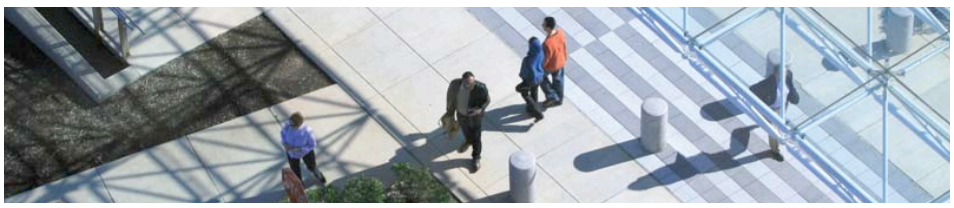

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Science, Technologies, and Knowledge in Societies Programme

The aim of this programme is to monitor and understand the extent of changes which have affected our societies in terms of knowledge: scientific and technological progress, the growing importance of life sciences and ICT, and the emergence of global issues tackled by sciences to name a few.

This programme analyses how science, technologies and knowledge unfold in different geographic and political areas, how they materialize in society, economy, culture and politics, and how individuals and societies from the North and the South, in the past and today, have learnt to live with science and techniques. It relies on a diachronic reflection that calls upon a large pluridisciplinary collaboration involving all science and disciplines. No scientific domain is excluded insofar as it addresses issues related to knowledge creation, appropriation or regulation, related stakes and conflicts, or the issues that knowledge raises in social, economic and political life.

PLINARITY

Sustainable Cities Programme

Cities centralise most of the challenges of the 21st century, e.g. energy in buildings and transport, new services to face the permanent influx and evolution of populations (e.g. population ageing). Urban and economic developments are closely interlinked. If not controlled, however, urban development can be the cause of dysfunctions and major social or environmental crises.

Improving the quality of life in urban areas implies improving city components in accordance with a rationale of sustainable development, by optimising the consumption of energy and natural resources (water, air, and soils), reducing pollution and greenhouse gas emissions, in a socially harmonious and economically sustainable context.

The programme focuses on applying sustainable development concepts to urban management and encourages scientific communities to gather around pluridisciplinary projects through systemic approaches tackling environmental, economic and social dimensions.

HM-TC

Project

Hippocampus, Memory and Temporal Consciousness (Flagship Programme 2009)

The overall goal of this project is to increase our understanding of human memory by exploring the functional and structural "connectome" associated with memory networks.

This is a major four-year research project to study the functional and anatomical connectivities in the medial temporal lobe in relation with memory networks using the most advanced neuroimaging technologies, including 7T structural MRI, MEG source imaging, high-resolution diffusion tractography and functional MRI. It could also lead to a better understanding and early diagnosis of Alzheimer's disease and related disorders.

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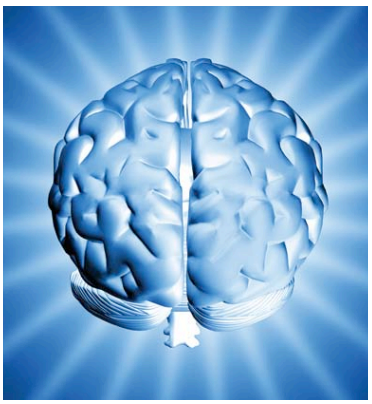

Project

ADAGe

Adjoint ice flow models for Data Assimilation in Glaciology (Complex Systems and Mathematical Modelling Programme 2009)

By gaining and losing mass, glaciers and ice-sheets play a key role in sea level changes. In the past 2000 years, for instance, the collapse of the large northern hemisphere ice-sheets after the Last Glacial Maximum contributed to a 120m rise in sea level. Recent observations clearly indicate that significant changes in the velocity structure of both Antarctic and Greenland ice-sheets are occurring, suggesting that large and irreversible changes may have been initiated.

The aim of this project is to develop data assimilation methods related to ice flow modelling in order to provide accurate and reliable estimates of the future contribution of ice-sheets to sea-level rise (SLR). Two approaches are used: (i) large scale model and satellite data and (ii) a local higher-order ice flow model and a fine resolution data network from a particular outlet glacier.

A better estimation of global contribution of ice-sheets to SLR will be ensured by taking into account local processes governing the global response.

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Global Environmental Changes Programme

Environmental issues are usually understood to result from the summing of independent phenomena, such as climate change, loss of biodiversity, intensive use of water, diffuse chemical pollution, etc. In fact, those issues are deeply interlinked by the superficial envelopes of the planet (air, water, soils…) and the evolution of human activities (demographic increase, progress in living and technological conditions, changes in social behaviour).

Environmental changes are now clearly understandable on a global scale, hence the terms 'global environmental changes' (or 'global changes'). The awareness of a global change, especially climatic, has resulted in a proliferation of programmes which have not sufficiently encouraged exchanges between disciplines. It is therefore a major challenge of current environmental research to favour the emergence of a systemic, multi- and trans-disciplinary approach to 'Earth System Science'.

The programme encourages prospective or retro-prospective research endeavours on the evolution of different economic, societal and ecological systems interacting under the impact of global change.

Complex Systems and Mathematical Modeling Programme

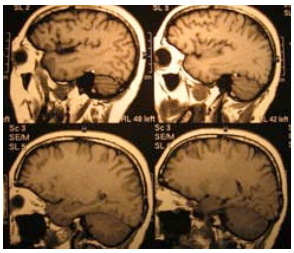
Contaminants, Ecosystems and Health
Programme

The globalisation of exchanges, climate change and the accelerated production of xenobiotics and new synthetic compounds increase the risks of contaminating ecosystems and animal and human health.

The increasing use of numerous biological and chemical molecules or physical factors (such as EM waves or magnetic fields) require in-depth knowledge of fundamental aspects of their dynamics in the environment (distribution, accumulation, transformation and biotransformation, and effects of climate changes) and of their potential impacts on ecosystems and health.

The aim of this programme is to foster fundamental and applied research on the dynamics of contaminants, their impact on ecosystems, and their effects on human and animal health.

Flagship (Phare) Programme:
Understanding and Modelling of Human Memory



This programme aims to contribute to significant advances in the understanding of human memory processes.

Applications of this research are expected in domains such as daily life, health, and information technologies.

The programme funds an ambitious project carried out by a pluridisciplinary consortium addressing this great challenge for the future.

This programme brings closer methods of applied mathematics, statistical concepts, physics and experimental data on complex systems.

It aims at understanding those systems through simplified models. These models should provide tools to understand and describe or even predict effects which seem out of reach of current science.

This programme finds applications in various domains including ecosystem dynamics, systems biology, biogeochemical cycles and mechanics of heterogeneous environments. The approaches include man-made systems such as those found in different engineering sciences (avionics, civil engineering, etc.).

Project

DeepCity3D

Integrated 3D visualisation for urban surface and underground data (Inter-Carnot Fraunhofer Programme 2009)

Cities and their hinterlands play a major role in history, culture, trade and development.
Many have geological issues which hinder their economic and sustainable development.
Moreover, the foundations of cities today harbour labyrinths of underground caves, quarries, tunnels and lifelines. Knowing the location of these underground infrastructures is crucial for continuous utility management, including rapid response to emergency situations and the efficient repair and extension of existing networks.
This project intends to develop application-adaptive 3D visualisation tools that integrate for the first time underground data and city models with advanced functions to support decision making in urban planning and environmental protection, and by professionals such as construction companies, insurance companies and architects.

For further information: www.deepcity3d.eu

INTENSIFYING PARTNE
ACADEMIA & INDUST

Promoting public-private partnership initiatives is one of the ANR's priorities. It supports collaborations between researchers from public institutions and industry, and the utilisation of the results of these collaborations.

The Agency focuses its efforts on both funding public-private collaborative research projects submitted in the framework of ANR calls, and encouraging contractual research funded directly by the private sector and resulting from close links between public laboratories and companies, by providing additional funding.
Initiatives in this context can span all scientific areas, therefore the Agency implements a wide variety of tools and mechanisms to facilitate collaboration between the academic and industrial teams through the entire research & innovation process, e.g.:

- Support to activities of Competitiveness Clusters and active promotion of public/private collaborative research;
- The Carnot Programme, whose aim is to foster public-private research as the core strategy of public research organisations and to develop direct research contracts with industry;
- The development of a web portal to help industrial players identify suitable academic partners.
  http://www.agence-nationale-recherche.fr /Ariane/index.py

LES PÔLES DE COMPÉTITIVITÉ

Tools and mechanisms for funding public/private R&D

Supporting the activities of Competitiveness clusters

With the world economy becoming increasingly competitive, France decided in 2004 to integrate the key factors of competitiveness in its new industrial policy. The most significant of these factors is the capacity for innovation.
Competitiveness clusters were created to enhance the French capacity for innovation. A competitiveness cluster is defined as an association of companies, research centres and educational institutions, working in partnership (under a common development strategy) to generate synergies in the execution of innovative projects targeting one or more given markets.
The aim of this policy is to encourage and support projects initiated by the economic and academic players in a given local area.

RSHIPS BETWEEN RY

The ANR has accompanied the clusters' policy since their creation, and considered them its partners in creating a favourable eco-system for public-private research. Through its incentive policy of providing additional funding to projects labelled by competitiveness clusters, the ANR enhances the relationships between researchers and the clusters.
Since 2005, 1340 projects labelled by clusters have been funded for a total amount of €940 M.
In 2009, 1246 labels were delivered and 1032 proposals were labelled, of which 254 were funded, giving a success rate of 24%.
ANR support amounted to €187.2 M for 254 projects labelled by 60 clusters with €6.57 M of additional funding.

4.5 partners | **€737 k of funding**

Average profile of a competitiveness cluster-labelled project

Since 2008, ANR's international projects co-funded with foreign funding agencies labelled by competitiveness clusters can receive an incentive matching fund, thereby encouraging the clusters to develop international cooperation with foreign partners. In parallel, this policy helps open up the clusters to the European Research Area and accompanies them in their international strategy.

Funding Carnot Institutes

LES INSTITUTS CARNOT

33 Carnot Institutes

€1.3 B global consolidated budget

12000 researchers

5000 research contracts

€205 M contractual income in 2008

€60 M ANR funding

The Carnot programme was created to support the development of research in partnership with industry by bringing public research players closer to the realities of the economic world while helping bridge the gap between fundamental and industrial research.
To this end, the French Ministry of Higher Education and Research delivers the 4-year Carnot label to public research structures - i.e. the Carnot Institutes - which undertake to place public-private research at the core of their strategy.
The ANR programme selects and monitors institutes that give priority to collaboration with partners from the business world. It grants them additional funding calculated on the basis of their income from contractual research with industry. The additional funding is to help them renew their scientific and technological skills and thus ensure the long-term viability of their capacities and their participation in the innovation process, as well as to increase their professionalisation.

Moreover, in order to encourage international networks, the ANR and the BMBF in Germany have set up a 3-year bilateral programme providing for a dedicated call for proposals for French-German collaborative research and innovation projects between the Fraunhofer institutes in Germany and the French Carnot institutes.
The 2009 call was a great success, with 79 proposals submitted in the fields of environment, energy, civil security, health, ICT and transport, of which 11 projects were funded.

DEVELOPING EUROPEA & INTERN

An ambitious international policy

The total funding devoted to transnational projects has been constantly increasing since the ANR was created. At the same time, the range of its collaborations has increased over the years, to the extent that the ANR now cooperates with agencies from three continents (Europe, Asia, and America).

KEY FIGURES

884 proposals submitted

12% of all ANR funded projects

159 projects co-funded

8% of ANR budget for calls

18% average selection rate

€330 k average ANR funding per project

€53.3 M Total funding

25% of collaborations outside Europe

The ANR's main partners are European funding agencies or ministries, while collaborations with countries outside Europe represent 25% of the transnational projects funded in 2009. The average selection rate (18%) and funding allocated to transnational projects (€330 k) are very close to the average for national projects.

Developing European and international collaboration is one of the ANR's priorities.

The international strategy of the ANR aims to promote France's scientific and technological excellence and innovation potential.

Research teams are involved in a continuous worldwide competition; the agency accordingly gives priority to reinforcing the integration of the French scientific community into the European Research Area and optimizing the position of its teams in the international competition, while attracting the top skills to the French scientific community.

Ideally, the goal is to build an international network of partner funding agencies, each one supporting its own national research teams in projects considered to be models of excellence. In such a network, agencies could work together to launch ambitious joint programmes or implement transnational calls for proposals and thus co-finance projects with multinational academic teams or public-private partnerships.

By funding transnational projects, the ANR encourages the initiation and deepening of collaboration between researchers, with the further aim of fostering the creation of European and international teams of excellence. Overall, the international action of the agency extends the international reach and policy of French research performing organisations.

The ANR also funds transnational public-private partnerships, which represent 30% of the total funding devoted to transnational collaborations in 2009. Overall, 29 'partnership' projects were co-funded with foreign agencies (76% in Europe, Germany being the main partner). The main themes of collaborations were plant and animal genomics, technologies for health, ICT, energy and transport and security.

N ATIONAL COLLABORATION

Instruments of cooperation

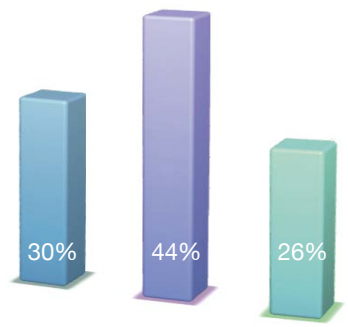
Competitive transnational projects may be funded through two types of collaboration:

- the opening of national thematic or non-thematic programmes to international collaboration;
- the launching of joint calls for proposals specifically dedicated to bi-, tri-, or multilateral collaborations. The participation in calls in the framework of European programmes such as ERA-NETs and article 169 initiatives is a specific form of multilateral collaboration.

In the framework of the opening of its national programmes, the ANR organises the co-funding of bi-national projects based on international agreements signed with partner agencies. These agreements demonstrate a common will to jointly support research projects on one or more scientific themes considered as strategic by both parties.

In dedicated joint transnational calls, a common call text is drawn up and a joint evaluation committee comprising international experts is created.

In 2009, 56% of the transnational projects were funded in the framework of dedicated joint calls, divided relatively evenly between bilateral and multilateral initiatives.



Strengthening European partnerships

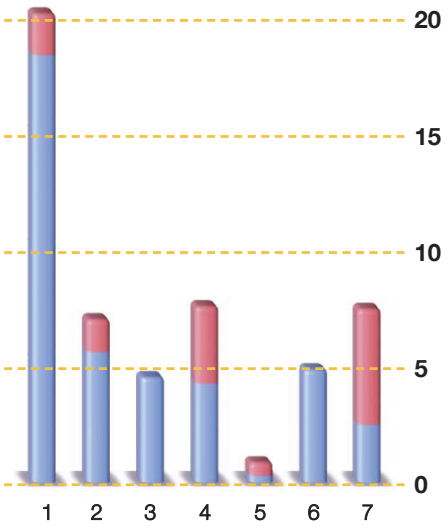
In 2009, the agency pursued the specific bi- or trilateral collaborations with foreign agencies, especially in the field of humanities and social sciences with the DFG in Germany, and in the domain of plant genomics with the German and Spanish Ministries of research (BMBF and MICINN). With the integration of FCT (Portugal) into the consortium in 2009, the initiative became quadrilateral. And further

Academic research
€38 M 72%

Public-private partnerships
€15 M 28%

European and international collaborations concern all scientific domains

ANR funding in M€



1 Biology and Health
2 Ecosystems and Sustainable Development
3 Sustainable Energy and Environment
4 Engineering, Processes and Security
5 Mathematics and Physics
6 Humanities and Social Sciences
7 ICT, Nanotechnologies

International
Europe

Project

NEDQIT

(ERA-NET NanoSci-ERA 2006)

Scalable quantum logic elements are obtained by implanting nitrogen atoms (N) (Technion group in Israel) in an ultrapure diamond matrix fabricated in France (LIMPH). Probing of the qubits' properties shows an electron spin coherence that is the longest ever measured in any solid-state system at room temperature with values above 1 ms. During this time, the qubits are preserved from strong unwanted interactions with their environment. Added to the scalability of the technology and the great ease with which spins can be controlled, manipulated and optically read out, this is an essential feature for the implementation of the quantum information protocols. Groups from the University of Bristol (UK) and ENS Cachan (France) are using these qubits in that purpose.
Led by the physics group of F. Jelezko (University of Stuttgart), this progress provides increased hope for a solid-state platform for the development of quantum technology devices operating at room temperature that could be used for secure communication over long distances and quantum computing.

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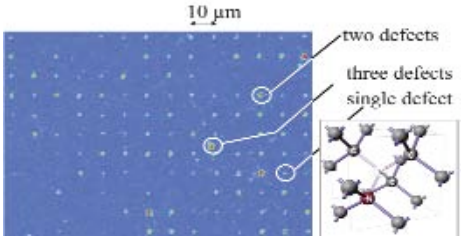


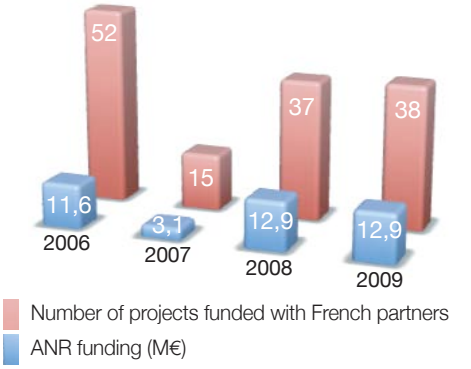
Fluorescence of the N atoms implanted in ultrapure diamond, showing the implantation pattern (false colours). Each green spot denotes the presence of a single atom.
Inset: Structure of the nitrogen-vacancy centre in diamond.

collaborations were initiated, with the UK's ESRC in social sciences and with the BMBF in the field of cardiovascular and metabolic diseases.
Lastly, following an agreement signed in 2008 between the ANR and the BMBF, the Inter Carnot-Fraunhofer programme was launched for 3 years in 2009. It aims at creating lasting relationships between the Carnot and Fraunhofer institutes and funds innovative public-private research projects between France and Germany.

On a strategic level, the agency contributes actively to the construction of the European Research Area and cooperates with the European Commission in the framework of FP7. ANR's programme managers participate in the discussions of the national thematic groups and therefore play a role in the programming process at the European level.
The ANR is France's representative in the 'Ideas' Committee of the European Research Council (ERC). It has also been a member of the EUROHORCS association since 2006 and of the European Science Foundation (ESF) since 2007.

The ANR has participated in multilateral 'ERA-NET' initiatives since 2006. It was member of 12 ERA-NET consortia in 2009 and participated in 5 calls for proposals within this framework. The agency is also member of the AAL 169 consortium and participated in both calls concerning the field of ambient assisted living.
The funding of these European projects represents nearly €13 M for 38 projects, i.e. 25% of the total funding allocated to transnational projects in 2009.
Since 2006, the ANR has funded 142 projects in the framework of 17 ERA-NETs, for a total sum of €40.5 M. In 2008 and 2009, the EC co-funded projects in the framework of the AAL initiative and the ERA-NET+ consortia ERASysBio+ and NanoSci-E+.

ERA-NETs: 17 calls since 2006
142 projects co-funded by ANR for €40.5 M



The ANR has moreover become coordinator of an ERA-NET initiative for the first time. The agency is coordinating the activities of CHIST-ERA, a consortium of nine research funding organisations in Europe, working on long-term challenges in ICT.

Project

French-German Project APPD

Landscape Archaeology in the Dogon Country
(ANR-DFG Bilateral call in social sciences and humanities 2007)

The Ounjougou site complex (Yame Walley, Dogon country, Mali) comprises a series of sites of varying size and function, revealing the great archaeological richness of a region until now considered lacking in any prehistoric evidence. It is a unique opportunity to study the direct relationship between population history, climate and environmental variability.
Since 2007, this interdisciplinary project has followed three main aims:
i) reconstructing the Dogon Country's Holocene landscape evolution and studying its interrelation to anthropogenic factors (fire, use of natural resources, herding, agriculture and metallurgy); ii) documenting the Dogon Country's actual cultural land-

CHIST-ERA covers a broader spectrum than the FP6 ERA-NET initiatives. The first call will be launched in Autumn 2010.

National programmes increasingly open to international collaborations

Because of the flexibility and efficiency of this instrument of cooperation, the opening of national programmes was intensified in 2009.
5 national thematic programmes were open to transnational collaborations: TecSan on the Technologies for Health and Autonomy with Taiwan (NSC), CSOSG on Concepts, Systems and Tools for Global Security and ALIA on Food and Food Industries with Germany (BMBF and DFG respectively), the programme Genomics and Plant Biotechnologies with Hungary (NKTH) and the programme Chemistry and Processes for Sustainable Development with Finland (AKA).
In 2008, the opening of the ANR bottom-up blue-sky 'Blanc' programme to Taiwan (NSC), China (NSFC) and Japan (JST and JSPS) was a clear success. The agency has therefore pursued and extended this experience to collaborations with other countries: Germany (DFG), Austria (FWF), Canada (NSERC), Chile (CONICYT), Hungary (NKTH), Mexico (CONACYT), and the United States (NSF).
As a result, the international 'Blanc' programme has become the Agency's main funding instrument for transnational projects: 55 projects were co-funded in 2009 for a total sum of €16 M, i.e. 30% of the agency's international cooperation budget.

COUNTRY	THEMES
Austria	Chemistry, Physics, Mathematics
Canada	ICT, Materials, Biotechnologies, Environment
Chile	ICT, Physics, Agronomy
China	Engineering, ICT
Germany	Chemistry
Hungary	Genomics, Biology and Health
Japan	ICT, Nanotechnologies, Robotics
Mexico	ICT, Nanosciences, Biotechnologies
Taiwan	ICT, Technologies for Health, Humanities and Social Sciences, Biology
USA	Chemistry, Nanosciences

scapes and their more recent history; iii) publishing the results in form of a landscape Atlas. Archaeological and environmental data show that human activities have played a dominant role in the landscape evolution during the Late Holocene in the Dogon country, which has been registered in the UNESCO World Heritage List since 1989.
In tandem with the Cultural Mission of Bandiagara, the French-German joint project is now engaged in the production of a diachronic landscape Atlas which will, in view of the rapid environmental and social changes, contribute to the protection and the valorization of the cultural landscapes of this exceptional area.

The French-German team digging in Ounjougou

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BIOMARKS

Project

(ERA-NET EuroTransBio 2006)

The aim of this study was to develop diagnostic and prognostic markers for veterinary diagnosis of cardiac and neurological diseases in the dog and the cat. In the long-term, these genetic and biological markers would be evaluated for diagnosis of homologous diseases in humans.
The project was organized in a pipeline where several diseases could be treated sequentially: hypertrophic and dilated cardiomyopathies, centronuclear myopathy, cerebellar ataxia and epilepsy. The main result was the finding of the causative mutation for cerebellar ataxia in the American Staffordshire Terrier, leading to the development, patenting and marketing of a DNA test. Other significant results were found for 5 others diseases, but they are still being studied.
The project shows all the steps of studies on genetic diseases in cats and dogs. The various studies were conducted simultaneously and have both strengthened the knowledge base and raised further questions for each of the participants. The cooperation between the Austrian and French teams brought true added value by speeding up the discovery process and giving access to the different tools required.

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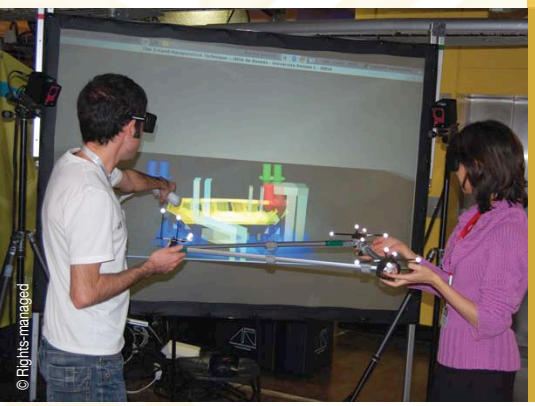
DISSEMINATING KNOWL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In 2009, four years after its creation, the ANR began the process of assessing its 2005 programmes and evaluating the financed projects. Several means have been put in place for this purpose.

Symposia and Workshops

The ANR in 2009 began the first assessment of its action since its creation in 2005. Nearly 40 symposiums were thus organized all over the country, some in partnership with the competitiveness cluster concerned.
A strong partnership with the "Cité des Sciences et de l'Industrie" science museum was initiated in 2009, with four 2005 programme assessment symposiums being held there.


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The ANR organized the **first assessment symposium on the 2005 edition of the Blanc programme** from 23 to 27 February 2009 at the Cité des Sciences et de l'Industrie. This symposium, punctuated by debates and thematic workshops, was attended by some 700 participants with 160 projects presented by both young and confirmed researchers.

EDGE

The first assessment symposium dedicated to **New Technologies for Energy** was held on 19 and 20 November 2009. Attended by more than 700 participants of whom over half were from industry, this symposium-exhibition presented the principle results obtained in the framework of the Hydrogen and fuel cells, Solar Photovoltaics, Bioenergies, CO_2 and Energy storage programmes. The presentations can be viewed on the symposium web site (www.colloques-2009-anr.fr).

A **biomedical research symposium** was organized on November 26 and 27 as part of the assessment of the 2005 Cardiovascular, Neurosciences, Rare diseases, and Microbiology/immunology programmes.

This symposium attracted nearly 950 participants and included a round table on translational research. An electronic satisfaction survey was conducted with the participants.

Lastly, the 2005 programmes assessment cycle ended with the symposium on **"What lines of research for tomorrows ICT?"** held from 5 to 7 January. This event united 780 participants for all the thematic ICT programmes and the ICT-related projects financed in the framework of the non-thematic programmes.

This major symposium - which has become a not-to-be-missed rendezvous for the ICT community - gave participants plenty to choose from, with 116 presentations featuring prominent guest speakers given in five thematic sessions, 245 explanatory posters and 56 demonstrations.

Reconciling research and economic issues: what the Carnot programme proposes

This meeting of 6 October 2009 brought together more than two hundred participants from the academic and business spheres. Its aim was underline the fact that the Carnot programme has a dual purpose:

- translate the needs of the world of business and industry into scientific resourcing projects;
- organize the practical application of the research results.

This scientific day, organized around three thematic sessions, saw the presentation of 45 resourcing projects, all carried out using the additional funding contributed by the Carnot programme.

The ANR Reviews

The ANR has launched a collection called "Cahiers de l'ANR" (The ANR Reviews) which addresses pertinent thematic questions that span the ANR's varied calls for proposals. This collection brings the ongoing research and technological advances into perspective. It is intended not only for researchers but also for decision makers and a wider public.

Each review addresses a domain through a cross-disciplinary approach. What are the technological, societal, economic and prospective issues? What is the ANR doing in this domain? The reviews do not attempt to make an exhaustive study of their subjects. The aim is to explain the broad themes and present the projects financed by the ANR on these themes in the form of summary sheets.

The first review entitled "Mobility and ubiquity: moving towards digital nomadism" presents a series of projects concerning research topics relating to the growth of the ubiquitous society. The way technologies for mobility have progressed over the last decade is truly impressive. Beyond mobility in itself, the review highlights the emerging ideas relative to the concepts of the ubiquitous society and digital nomadism.

(http://www.agence-nationale-recherche.fr/documents/uploaded/2009/Cahier-ANR-1-Nomadisme.pdf)

APPENDIX

INTERNATIONAL COOPERATION 2009

2009	Number of proposals submitted	Number of proposals submitted with French partners	Number of co-funded projects with French partners	ANR funding (in M€)
ERA-NET E-Rare: Rare diseases	150	99	11	2.2
ERA-NET NEURON: Brain disease	81	46	7	2.2
ERA-NET ERASYSBIO+: Systems biology	126	65	9	3.9
ERA-NET EuroNanoMed: Nanomedicine	24	14	6	1.6
AAL 169 – Ambient Assisted Living	100	13	5	2.9
Specific bi- and multilateral calls:				
Quadrilateral ANR-BMBF-MICINN-FCT: Plant genomics	47	47	9	3.9
Bilateral ANR-DFG: Non thematic on Humanities and Social Sciences	57	57	15	3.5
Bilateral ANR-ESRC: Non thematic on social sciences	47	47	7	1.4
Bilateral ANR-BMBF: Cardiovascular and metabolic diseases	49	49	8	3.1
Inter Carnot-Fraunhofer PICF	79	79	11	3.8
Opening of programmes:				
Blanc international: Germany (DFG)	59	59	9	2.3
Austria (FWF)	19	19	4	0.9
Canada (NSERC)	34	34	6	2.2
Chile (CONICYT)	23	23	3	0.7
China (NSFC)	65	65	12	3.1
United States (NSF)	11	11	2	0.7
Hungary (NKTH)	28	28	6	2.2
Japan (JST)	10	10	2	0.7
Mexico (CONACYT)	19	19	4	1.2
Taiwan (NSC)	35	35	7	1.8
Total 'Blanc' international	303	303	55	16
TecSan Technologies for health – Taiwan (NSC)	5	5	1	0.7
CSOSG Global security – Germany (BMBF)	3	3	1	1.1
ALIA Food – Germany (DFG)	8	8	3	1
Genomics and plant biotechnologies – Hungary (NKTH)			2	0.6
Chemistry and processes for sustainable development – Finland (AKA)	2	2	2	0.6
Projects submitted and funded without formal agreements:				
P3N Nanotechnologies – USA (NSF)	10	9	2	1
VTT Vehicles for terrestrial transports – Germany (Deufrako)	3	3	1	0.7
Habisol Smart and solar housing (project funded with Spain)	2	2	1	1.3
Stock-E Energy storage (projects funded with Germany and Switzerland)	4	4	2	1.5

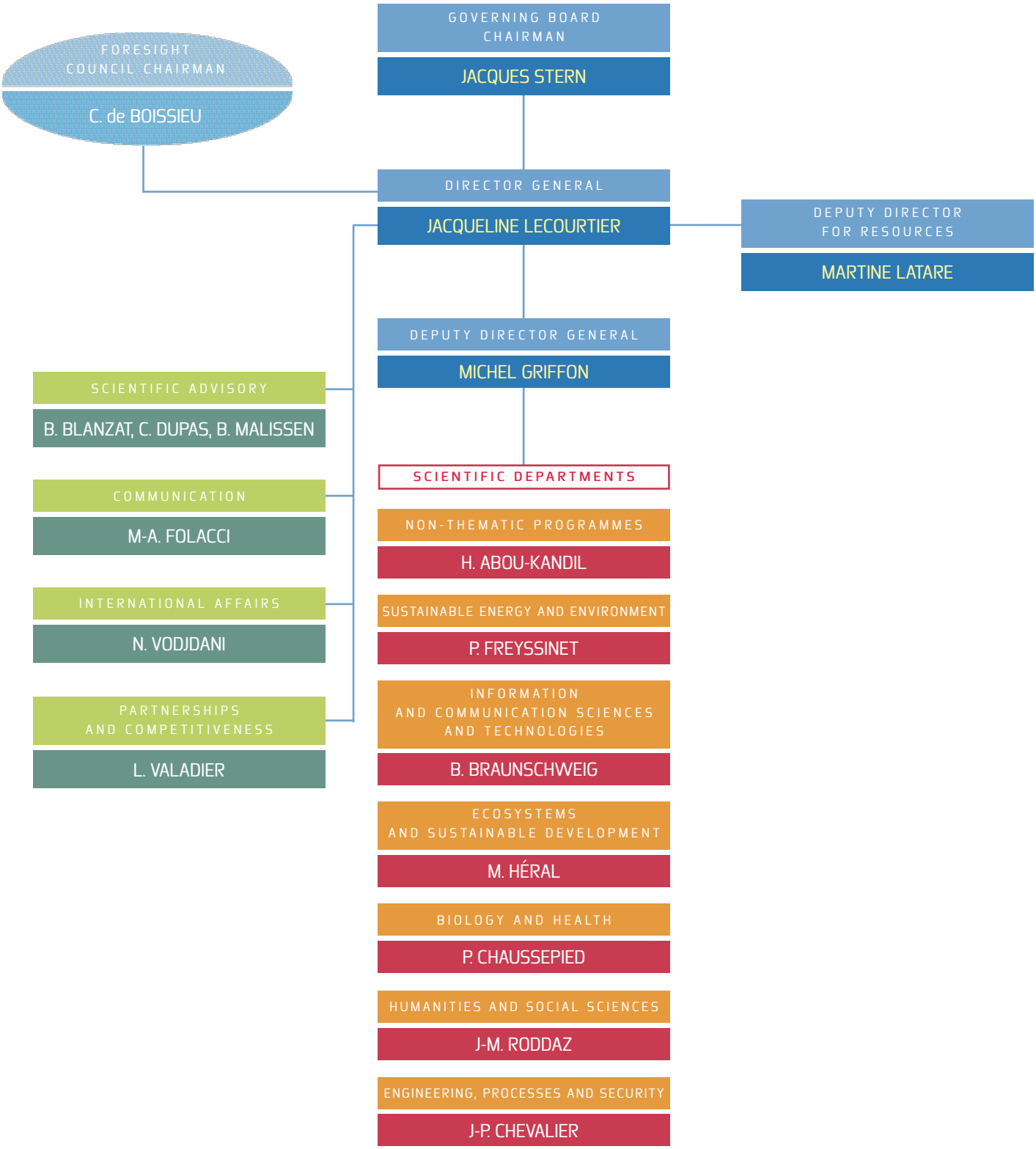
Programme Acronym	Programme Title
Information and Communication Sciences and Technologies	
ARPEGE	Embedded Systems and Large Infrastructures
CONTINT	Content and Interactions
COSINUS	Design and Simulation
DEFIS	Emerging Technologies
VERSO	Future Networks and Services
P3N	Nanosciences, Nanotechnologies, Nanosystems
SYSCOMM	Complex Systems and Mathematical Modeling
NANOINNOV/RT	Technological Research Programme: Recovery Plan 2009 in Nanotechnology
Biology and Health	
PIRIBio	Interdisciplinary Programme in Biological Systems and Biomedical Innovation
GENOPAT	Molecular Physiopathology: From rare to common diseases
MNP	Neurological and Psychiatric Diseases
MIE	Infectious Diseases and their Environment
BiotecS	Health Biotechnology (Public Private Partnership)
EmergenceBio	Emergence and Maturation of Biotechnology Projects with a strong potential of valorisation
TecSan	Technologies for Health and Autonomy (Public Private Partnership)
Emergence Tec	Emergence and Maturation of Technologies for Health and Autonomy Projects with a strong potential of valorisation
AAL 169	Transnational Programme in Ambient Assisted Living
ERA-NET EuroNanoMed	Transnational Programme in Nanomedicine
ERA-NET Neuron	Transnational Programme in Neurological and Psychiatric Diseases
ERA-NET E-Rare	Transnational Programme in Rare Diseases
ERA-NET + EraSysBio +	Transnational Programme in Systems Biology
Bilateral ANR-BMBF	Bilateral Programme ANR-BMBF in Genomics and Physiopathology of Cardiovascular and Metabolic Diseases
Engineering, Processes and Security	
CP2D	Sustainable Chemistry and Processes
CSOSG	Concepts, Systems and Tools for Global Security
MatetPro	Functional Materials and Innovative Processes
Ecosystems and Sustainable Development	
ALIA	Food and Food Industries
Systerra	Ecosystems, Territories, Living Resources and Agriculture
N/A	The 6th Extinction: Quantifying Loss of Biodiversity
N/A	Genomics and Plant Biotechnologies
Sustainable Energy and Environment	
N/A	Bioenergies
H-PAC	Hydrogen and Fuel Cells
VTT	Ground Transportation
EESI	Energy Efficiency and Reduction of CO2 Emissions in Indutrial Systems
HABISOL	Smart Building and Solar Photovoltaic
Stock-E	Innovative Storage of Energy
ECOTECH	Sustainable Production and Environmental Technologies
RiskNat	Natural Hazards: Understanding and Control
CEP	Global Environmental Changes
N/A	Sustainable Cities
Social Sciences and Humanities	
N/A	Children and Childhood
N/A	Sciences, Technologies, and Knowledge in Societies
N/A	French-German Programme in Social Sciences and Humanities
N/A	French-British Programme in Social Sciences
Partnership and Competitiveness	
PICF	Inter-Carnot Fraunhofer Progamme
Non-thematic Programmes	
Blanc	Blanc Programme
Blanc International	International Blanc Programme
N/A	Chairs of Excellence
JCJC	Young Researchers
N/A	Post-doctoral Return

** For transnational programmes, only projects with French partners are taken into account ** For transnational programmes, only ANR funding is taken into account *** EC contribution*

Number of proposals submitted*	Number of projects funded*	Selection rate	Total ANR funding (in M€)	Average funding per project** (in k€)
65	18	27.6%	16.25	903
121	31	25.6%	19.55	685
60	15	25%	11.67	778
42	10	23.8%	7.66	766
66	19	28.8%	19.2	1011
208	45	22%	34.1	757
71	15	21%	6.33	423
31	9	29%	17.0	1889
156	31	19.9%	15.34	495
188	39	20.7%	16.97	547
195	40	20.5%	19.27	482
153	31	20.3%	11.86	383
66	18	27.3%	16.05	889
89	25	28.1%	5.26	210
83	20	24%	15.26	750
30	8	26.7%	1.65	200
13	5	38.5%	2.90***	600
14	6	43%	1.65	275
46	7	15%	2.19	312
99	11	15%	2.22	202
65	9	14%	3.90***	278
49	8	16%	3.15	394
60	20	33%	12.4	620
55	14	25%	12.66	904
85	22	26%	19.4	895
65	15	23%	7.8	522
48	10	20.8%	8.18	818
41	12	29%	7.9	663
159	42	27%	22.5	537
22	7	31.8%	6.5	928
48	10	20.8%	9.0	900
53	15	28.3%	15.8	1050
22	6	27.2%	6.5	1100
48	14	29.1%	11.1	786
31	9	29%	7.0	785
65	16	24.6%	10.9	681
34	9	26.5%	5.3	596
24	7	29.1%	5.7	815
43	11	25.6%	8.5	772
55	12	21.8%	2.37	220
84	21	25%	5.19	247
57	15	26.3%	3.5	233
47	7	14.9%	1.44	205
79	11	14%	3.78	345
1636	371	22.7%	148.5	400
303	55	18.5%	15.9	289
56	15	26.8%	7.6	507
774	146	18.9%	27.1	186
84	26	31%	11.5	442

included

Organization chart 2009



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