SPOTLIGHT ON FRANCE

# France's footprint on the international research landscape

France is at the heart of many international research initiatives. What factors have led to its prominence?

"Three European organisations in the same location allows scientific collaborations."

Manuel Rodriguez Castellano, European Synchrotron Radiation Facility (ESRF)

WHEN CHEMIST Andrew Harrison arrived in Grenoble in 2006, he didn't realise how the city's location at the foot of the Alps was instrumental in attracting the best scientists to its research institutes. "[Grenoble] is a pretty amazing place, with the highest concentration of research facilities in Europe," says Harrison, now director of the Laue-Langevin Institute (ILL), an international research centre based in north-west Grenoble. However, he says if ILL had been based "in a much less attractive town, we would not have had the success we have had".

Grenoble's picturesque Alpine setting is just one of the many drawcards for international researchers. France as a whole has become a significant centre and during the past few decades the country has established several international research initiatives in strategically important locations. These include an experimental fusion reactor project, ITER, under construction at the Cadarache site in Saint-Paul-lez-Durance in the south of France, the headquarters of the European Space Agency (ESA) in Paris, the World Health Organisation's International Agency for Research on Cancer (IARC) in Lyon, and the European Synchrotron Radiation Facility (ESRF) and European Molecular Biology Laboratory (EMBL) site alongside ILL in Grenoble.

In addition, the Human Frontier Research Programme Organization (HFSPO), a multidisciplinary research funding agency, is based in Strasbourg near the border with Germany, and particle physics laboratory CERN straddles the Franco-Swiss border. All are located on French territory and all enjoy substantial fiscal support from within France.

France's research efforts have also become more international. Research institutions such as the National Centre for Scientific Research (CNRS), the National Institute of Health and Medical Research (INSERM) and the SOLEIL synchrotron — all headquartered or based around Paris — increasingly collaborate with partners from around the world in line with the 2009-2012 national strategy for research and innovation. As well as preserving existing relationships, the strategy highlights plans for further international alliances. According to Minh Ha Pham-Delègue, director of international relations at CNRS, the main countries targeted for associations are Brazil, Russia, India and China — collectively called the BRIC countries — plus Japan, South Korea, Singapore and Taiwan. Such collaborations are

often initiated by scientists from these countries who have trained in France, says Pham-Delègue.

By fostering international research organisations and encouraging French researchers to cooperate with their international counterparts, French politicians have become adept at playing the winning card in the scientific diplomacy game.

#### Why France?

Diplomatic skills were vital during protracted negotiations between supporting member states to decide where international research facilities should be established. For example, it took three years of discussion between ITER's seven members (the European Union, Russia, China, Korea, India, Japan and the United States) before the decision was made in 2005 to build the reactor in Saint-Paul-lez-Durance. Among the deciding factors was the proximity of an existing energy research infrastructure that included the Tore Supra tokamak and CEA Cadarache, a national fusion research centre belonging to the French Atomic Energy and Alternative Energies Commission (CEA). Another incentive was the French government's provision of a free site for the project and its agreement to take on the preparatory works, building the ITER headquarters and future decommissioning of the site.

Benefits in kind also helped other establishments. The HFSPO chose to set up headquarters in Strasbourg in 1989 partly because city officials offered free office space for the first five years. The agency also received financial support from the Alsace region and the national government ministries for foreign affairs and research and innovation. Now that the HFSPO has acquired its own offices, the



Alsace region and Strasbourg provide an annual financial contribution, worth around €430,000 in 2010. Strasbourg is also home to the headquarters of the European Science Foundation (ESF) and the official seat of the European Parliament, which was another lure for the HFSPO.

In Grenoble, the presence of an emerging scientific hub convinced several other organisations to settle there. The founding members of the hub included the Joseph Fourier University, the ILL and the CEA. "The existing [research] infrastructure made Grenoble attractive for EMBL," says Silke Schumacher, EMBL's director of international relations, adding that the laboratory also received incentives such as a rent-free site and tax breaks. Since then the renowned Institute of Structural Biology (IBS) has also been established in Grenoble, further enhancing the city's scientific reputation.

ESRF followed in the footsteps of EMBL, influenced by the possible

synergies with other international players. "With three European organisations [in the same] location, this allows scientific collaborations, common services and sharing of some expenditures," says Manuel Rodriguez Castellano, director of administration at ESRF.

#### Access to infrastructure

Many of the international facilities in France are at the vanguard of their discipline, which attracts a wealth of scientific talent. The ILL, for example, operates one of the most intense sources of neutrons in the world and hosts around 1,200 researchers from over 40 countries each year. "When you walk through the door, you bump into leaders in the field everywhere you go," says Harrison.

A key benefit for visiting scientists is that access to cuttingedge equipment is supported by the organisations' employees. "Our scientists spend a lot of time ensuring that users [are able to run] the best possible experiment," says



The SOLEIL synchrotron, based near Paris, offers a good support network for international scientists and provides access to cutting-edge equipment.

Jean Daillant, general director of the SOLEIL synchrotron. The facility also encourages its employees to develop their own research. "Our target is to reach 40% of activity dedicated to our own research," explains Daillant, a proportion that would represent an increase

of more than 10% compared to current in-house research efforts.

#### Sources of funding

The international organisations that mainly offer financial support to scientists can create funding avenues that may not otherwise be available >>>



at a national level, such as support for cross-discipline research. "If you are a chemist and want to get a grant from a national research agency, it is very hard to get a grant [for research] outside your discipline," explains Ernst-Ludwig Winnacker, secretary general of the HFSPO.

Although international funding can open up new research routes, securing it can be a fiercely competitive process. Before receiving help from the HFSPO coffers, for example, research projects have to undergo an international peer-review stage that Winnacker says is more rigorous than that of many national funding schemes.

State funding is also available to international scientists through national research institutions, but to win support, standards must reach a high level. The joint CNRS/INSERM Atip-Avenir life sciences and health research funding programme is one of the highly selective schemes that are open to both French and foreign scientists. "The programme is designed to support bright young scientists capable of leading their own research," explains Philippe Arhets, deputy director of INSERM's department for partnership and external relations. Successful candidates receive a grant of around €280,000 for the first three years with the possibility of additional funding for one or two postdoctoral positions. "[It's] a good training ground before applying for European Research Council (ERC) grants," adds Arhets. Indeed, France has been among the top three countries for receiving ERC grants since the ERC was created in 2007 (see table for top ten institutions). In addition, national institutions have always been open to hiring international researchers currently just over 25% of employees at CNRS are from outside France.

Time at an international research organisation on a CV can boost long-term career prospects. "It is very easy to find a job [after working at ESRF]," says Rodriguez Castellano. "You need to be mobile, but there are opportunities at other synchrotron facilities." Scientists may also be recruited by one of the French universities, which are keen to reap the rewards of international research.

#### **Future perspectives**

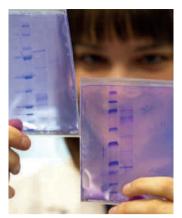
International research in France, as in other countries, is subject to the impact of events such as the 9.0 magnitude earthquake that struck Japan in March 2011. One immediate consequence was a shift in the ultra-precise alignment of the SOLEIL synchroton beam. This tiny movement echoes the more serious disruption to international research, as well to Japan's own scientists. For example, parts of the ITER reactor that were due to be manufactured in Japan have been delayed by two

years and an alternative had to be found. Due to research budget constraints, the country may also need to reduce its contribution to international agencies such as the HFSPO. As most international research initiatives are funded by governments, other factors such as the current global economic downturn can also pose challenges.

To maintain stability, many international facilities are canvassing potential members. For example, ESRF is looking for support from Russia, India, South Africa and Ireland. "We trust our existing members while attempting to attract new ones," says ESRF's Rodriguez Castellano. As well as courting additional contributors, new sources of funding are being sought. Further funding for ITER could either be integrated into Horizon 2020, the EU's eighth framework programme for research and innovation, or come from other EU funds.

#### **Recruitment prospects**

Despite the uncertainty of securing sustainable government funding, recruitment prospects in international research organisations in France remain buoyant. Those whose support is financial — without providing access to equipment — fund three- to five-year research contracts at both postdoctoral and PhD level. For example, HFSPO offers 35 project grants of between €110,000 and



A scientist from the CNRS/INSERM Atip-Avenir programme studying an acrylamide gel.

€150,000 each year to support collaborations on multidisciplinary research with very little bureaucracy. It also offers postdoctoral grants of around €45,000 each year to around 100 scientists going into life sciences from other fields.

The recruitment outlook in organisations providing research infrastructure, such as the ESRF, EMBL, ILL, the SOLEIL synchrotron and ITER. is also bright. Most organisations implement ongoing recruitment drives for scientists with a wide range of backgrounds, including biology, chemistry, physics, IT and engineering. ITER is expected to recruit 5,000 people by 2014, says spokesman Michel Claessens. The project is seeking scientists "from all engineering, physics, plasma physics, computer science and nuclear [engineering] backgrounds," he adds.

At ILL, a third of positions are filled on fixed-term contracts, so there is a regular turnover of staff. "Every year we recruit a significant number of scientists," says Harrison.

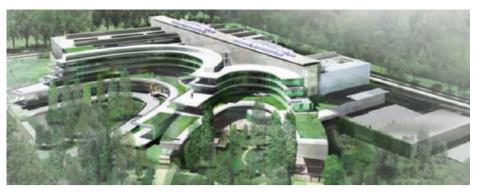
#### **An international leader**

France's long-established position as a scientific heavyweight has lured some of the most prestigious international research organisations to its territory. Its prominence as a host or major partner often creates synergies with national research activities while also allowing scientists access to prestigious research circles. A good quality of life, such as that found in Grenoble, is an added incentive. Nature editorial staff have no responsibility for content

#### Top ten French research institutions receiving European Research Council (ERC) funding

Rank	Research institution	Total number of starting grants (2007-2011)	Total number of advanced grants (2007-2010)	Total number of grants as of October 2011
1	National Centre for Scientific Research (CNRS)	85	34	119
2=	National Institute of Health and Medical Research (INSERM)	18	10	28
2=	Atomic Energy and Alternative Energies Commission (CEA)	23	5	28
4	National Computer Science Research Institute (INRIA)	12	6	18
5	Pasteur Institute	11	4	15
6=	Ecole Normale Supérieure (ENS)	6	3	9
6=	Curie Institute	6	3	9
8	Pierre and Marie Curie (Paris IV) University	3	4	7
9=	Jean-Jacques Laffont Foundation	3	3	6
9=	European Centre of Research in Biology and Medicine (CERBM)	4	2	6
Source: European Research Council, National Contact Point for France.				





## Chief Executive Officer of the University Cancer Institute of Toulouse Midi-Pyrénées (South of France).

The innovative European campus, Oncopole Cancer Campus of Toulouse, will house over 4,000 persons on a site covering almost 2 million m<sup>2</sup>, with the combined support of the European Community, the French Government, local public authorities and private investment exceeding one billion Euros. This Cancer Campus will include at its heart a large University Cancer Institute (UCI), which will feature both a 300bed 65,000 m<sup>2</sup> hospital and the adjoining 10,000 m<sup>2</sup> Cancer Research Center of Toulouse (CRCT, which is a Inserm/CNRS/University Paul Sabatier laboratory), including a total floor space for research team (5200  $m^2$ ), their administration (800  $m^2$ ) and many facilities (such as 2700  $m^2$  animal facility).

The UCI is connected on site to:

- an interdisciplinary research center dedicated to innovation in biology (Centre P. Potier/ITAV)
- pharmaceutical companies (Sanofi, Pierre Fabre) and biotechs
- a large amount of technological platforms and facilities.

The University of Toulouse, acting on behalf of the co-sponsors of the Oncopole, is inviting applications for the important post of Chief Executive Officer of UCI.

The CEO will run the UCI including the Hospital and the Cancer Research Center of Toulouse. He/she will bring vision and main orientations for research and care. He/she will define in co-development with the main key stakeholders, and his/her team, the medical and scientific project. He/she will then be responsible for the implementation of the project, impacting research works, translational research, therapeutical protocols, technological platforms, innovation transfer, international partnerships... He/she will contribute to develop the UCI in 5 years as one of the most renowned international cancer centers.

#### Missions:

- Have the responsibility of drawing up the medical and scientific programs, budgets and reports;
- Support the implantation and the development of new clinical and research labs at the UCI (Hospital and CRCT);
- Promote the UCI at the international level;
- Favor the industrial development of UCI findings together with the Oncopole partners (pharmas, Centre Pierre Potier/ITAV, etc.);
- Coordinate the regional clinical strategy in the fields of oncology

He/she chairs a Board, with the Secretary General, the Research Director and the Hospital Director.

He/she must be a MD/PhD in an oncological discipline and have a successful track record in the management of a hospital and/or a translational research lab and/or a health or research organization

The CEO will start his/her mission at the latest on January 1st 2013.

This is a 5 year position with internationally competitive salary.

All applications will be considered by the nominating committee chaired by J. Mendelson (Houston).

Candidates should submit their curriculum vitae + letter of application + list of publications + letters of recommendation to the President of University of Toulouse 3, Pr. Gilles FOURTANIER (iuc.recrutement@univ-tlse3.fr)



#### Bureau International des Poids et Mesures - BIPM Director

The Comité International des Poids et Mesures (CIPM) invites applications for the post of Director of the Bureau International des Poids et Mesures (BIPM), which will fall vacant in the first half of 2014 on the retirement of the present Director. Prof. Dr. M. Kühne. The successful candidate will be engaged initially as Deputy Director (Director designate) and it is expected that he or she will take up the post of Deputy Director/Director designate in the first quarter of 2013.

The BIPM is the scientific and administrative centre of the Intergovernmental Organization of the Metre Convention. It operates under the authority of the CIPM, which itself is under the authority of the Conférence Générale des Poids et Mesures (CGPM) currently composed of fifty-five Member States of the BIPM.

The BIPM's scientific and administrative work has as its aim the assurance of a stable and reliable world-wide measurement system based on the International System of Units (SI).

To achieve this, the BIPM works in close collaboration with the National Metrology Institutes (NMIs) of its Member States and liaises with other intergovernmental organizations and international bodies with an interest in reliable measurements as well as with the NMIs of the Associates of the CGPM.

The BIPM operates a world-class scientific laboratory charged with the realization and comparison of measurement standards in the fields of mass, time/frequency, electricity, ionizing radiation and chemistry.

The BIPM is also responsible for the implementation and maintenance of the Mutual Recognition Arrangement of national measurement standards and of calibration and measurement certificates issued by National Metrology Institutes (CIPM MRA). The CIPM MRA includes calibration and measurement capabilities in all fields of measurement and is executed in close cooperation with the Regional Metrology Organizations (RMOs).

#### **Duties**

The Director is responsible to the CIPM for the running of the BIPM, which has an international staff of about eighty and an annual budget of some 12.5 million

The Director acts as chief executive of the BIPM in the execution of its activities and carries a major responsibility for initiating and carrying through policy adopted by the CIPM on matters related to international metrology. The Director participates in all meetings of the ten scientific Consultative Committees of the CIPM and is chairman of the Joint Committee of the Regional Metrology Organizations and the BIPM. The Director is expected to maintain contact, either directly or through the RMOs, with the NMIs of the Member States.

Further, the Director is expected to liaise actively with other intergovernmental organizations and international bodies with the aim of improving the comparability and reliability of measurement results in support of fair trade, the elimination of technical barriers to trade, industrial innovation, society and quality of life. He/she shall pay special attention to the development and improvement of the metrological infrastructure in developing countries.

#### Deputy Director/Director designate

Until the retirement of the present Director, the Director designate will hold the post of Deputy Director. There will be a probationary period of one year from the date of appointment as Deputy Director.

#### **Employment conditions**

The BIPM is located at the Pavillon de Breteuil in Sèvres. France, situated in the outskirts of Paris. The BIPM offers a full-time appointment for an initial period

The salary is commensurate with the responsibilities and duties of the post. Living accommodation is provided at the premises of the BIPM. Conditions of employment, subject to the decisions of the bureau of the CIPM, are detailed in the Regulations, Rules and Instructions applicable to staff members of the BIPM. The BIPM operates its own contributory pension scheme and subscribes to a private medical insurance plan for its staff and their families. The BIPM, its staff and its site enjoy privileges and immunities normally granted by the French government to intergovernmental organizations.

#### **Oualifications**

A chief executive is sought with an outstanding record of achievement in science and technology, with proven leadership and management capabilities in a research based environment, and with demonstrated diplomatic skills.

Candidates are required to be fluent in English and be prepared to obtain a working knowledge of French, although the latter is not a requirement at the outset.

#### **Applications**

Applications should be sent to the President of the CIPM, Dr. B.D. Inglis, and should include a covering letter, a curriculum vitae, a list of publications and the names of three referees who may be approached to give their opinion on the candidate's suitability for the post. Shortlisted applicants will be invited for an interview. Prospective candidates are encouraged to make preliminary contact, in confidence, with either the President of the CIPM (barry.inglis@measurement. gov.au) or the Director of the BIPM (mkuehne@bipm.org). More information on the BIPM and its activities are to be found on the BIPM web site: http://www.

The BIPM is an Equal Opportunity Employer. Applications should be addressed to: The President of the CIPM Dr. B.D. Inglis

Pavillon de Breteuil F-92312 Sèvres Cedex

Application Closing Date: Thursday 1 December 2011

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#### Post-Doctoral Positions in Nice and Strasbourg

Two 2-year positions are available in January 2012 at the newly created Institute of Biology Valrose (iBV) and INSERM U682 to study matrix/integrin-generated signaling in the invasive phenotype of head and neck tumors. This project brings together basic and clinical scientists with complementary expertise (cell biology, mouse tumor models, epigenetics, virology, radiotherapy and human tumor pathology) and state-of-the-art techniques. The successful candidates (PhD or MD/PhD) should have training in Cellular or Molecular Biology and an interest in signal transduction; experience in cell imaging and animal models will be an asset.

Send by email full CV including research interests and list of 3 references to:

Ellen Van Obberghen-Schilling, PhD IDBC, UNS-CNRS UMR-6543, Nice E-mail: vanobber@unice.fr (http://ibdc.unice.fr/) Gertraud Orend, PhD INSERM U682, Strasbourg

E-mail: orend@unistra.fr (http://u682-inserm.u-strasbg.fr)









A Postdoctoral Position is available starting January 2012 for a 2-year period with possible extension in the research team headed by Emmanuel Van Obberghen in the newly created IRCAN (Institute for Research on Cancer and Aging of Nice) center on the Medical School Pasteur Campus of the University of Nice-Sophia-Antipolis. An integrated approach combining molecular and in vivo techniques will be applied aimed at studying the mechanisms responsible for the increased risk of diabetes in offspring of rats exposed during their pregnancy to unfavorable conditions. A special focus will be on epigenetic factors including microRNAs. We are seeking a recently graduated PhD or MD/PhD with a solid background in molecular/cellular biology who is also interested in whole animal approaches and the pathophysiology of type 2 diabetes. The successful candidate is expected to integrate our research team and have excellent interpersonal and communication skills.

Applicants should submit curriculum vitae, names, @ addresses, of 3 references.

#### Contact:

Emmanuel Van Obberghen, MD, PhD Medical School, University of Nice-Sophia-Antipolis UMR UNS-INSERM 907, Avenue de Valombrose, 28, 06107, Nice Cedex 2, France



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Online registration at www.cnrs.fr from December 1, 2011

Registration deadline January 5, 2012







## Post-doctoral position available from January 2012 Apoptosis, Cancer and Immunity laboratory

Unité INSERM U848 **Director Guido Kroemer** Paris/Villejuif **FRANCE** 

#### Research project:

A postdoctoral position is available to study caspase-independent programmed cell death mediated by the mitochondrial protein Apoptosis-Inducing factor (AIF).

Our laboratory (Unité INSERM U848) was the first to formulate the hypothesis that mitochondria played a central role in the regulation of apoptosis. The actual work of the group is dedicated to the molecular definition and inter-relationships of different types of programmed cell death (PCD) in various mammalian

Our goal is to apply the knowledge generated through fundamental approaches to the design of novel therapeutic strategies especially in the field of oncology and neuroprotection.

The laboratory is equipped with state-of-the-art technical facilities: microscopy and automatic cell imaging facilities, flow cytometry and metabolomics platforms. Moreover, we have full access to core facilities managed by Institut Gustave Roussy (ex: genomic platform; small animal facility ..).

#### Candidate profile:

- Strong experience with standard techniques in biochemistry, cell and molecular biology and cell imaging.
- Highly motivated, with excellent communication skills.
- Fluent in English.

Position will be available from January 2012 for 2 years (ANR-funded Inserm contract).

#### Application:

Highly qualified and talented applicants should send a motivation letter, CV, list of publications, and contact information for three references to Dr. Nazanine Moditahedi (nazanine@igr.fr).

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#### Molecular Mechanisms of Mycobacterial Infections

- Molecular aspects of mycobacteria pathogenicity and characterization of potential drug targets and inhibitors
- Development of new strategies for the discovery of tuberculosis vaccine candidates

#### FOR REFERENCE

Nature, 2011, doi:10.1038/nature10540; Nature Struct Mol Biol, 2011, 18:915; Cell Host Microbe, 2011 10:248 PNAS 2011 108:13230 FMRO J 2011 30:1608 PNAS 2011 108:10443 FMRO J 2010 29:1573: PNAS, 2010, 107:21016; J Exp Med, 2009, 206:2205; PLoS Med, 2009, 6:e1000199; PNAS, 2009, 106:9021; PLoS Biol 2009, 7:e1000220; Nature, 2007, 447:606; Science, 2005, 310:1321

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### Research Associate - Statistical Finance

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Although numerical skills in data analysis and interest in modeling financial time series are crucial, no prior knowledge in the field is required.

If you are interested in this permanent position or in a post doc, please send a resume and a letter explaining why you think you are particularly adapted to the job described above. Include also what you consider your best scientific publication (only one, please) to: recrut@cfm.fr

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