

特集：日本数学会関孝和賞受賞

On the occasion of receiving the Seki-Takakazu Prize

Jean-Pierre Bourguignon, the director of IHÉS

A brief introduction to the Institut des Hautes Études Scientifiques

The Institut des Hautes Études Scientifiques (IHÉS) was founded in 1958 by Léon MOTCHANE, an industrialist with a passion for mathematics, whose ambition was to create a research centre in Europe, counterpart to the renowned Institute for Advanced Study (IAS), Princeton, United States. IHÉS became a foundation acknowledged in the public interest in 1981. Like its model, IHÉS has a small number of Permanent Professors (5 presently), and hosts every year some 250 visitors coming from all around the world. A Scientific Council consisting of the Director, the Permanent Professors, the Léon Motchane professor and an equal number of external members is in charge of defining the scientific strategy of the Institute.

The foundation is managed by an 18 member international Board of Directors selected for their expertise in science or in management. The French Minister of Research or their representative and the General Director of CNRS are members of the Board. IHÉS accounts are audited and certified by an international accountancy firm, Deloitte, Touche & Tomatsu. Its resources come from many different sources: half of its budget is provided by a contract with the French government, but institutions from some 10 countries, companies, foundations provide the other half, together with the income from the endowment of the Institute.

Some 50 years after its creation, the high quality of its Permanent Professors and of its selected visiting researchers has established IHÉS as a research institute of world stature. Seven professors amongst the ten mathematicians, who have been at IHÉS, have been awarded the prestigious Fields Medal, the highest international award for mathematicians. The most recent Fields recipient is Laurent LAFFORGUE who was distinguished in 2002. That so many IHÉS Professors have been chosen to receive this award is a great honour.



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The present Permanent Professors are Thibault DAMOUR (at IHÉS since 1989), Mikhail GROMOV (at IHÉS since 1982), Maxim KONTSEVICH (at IHÉS since 1995), Laurent LAFFORGUE (at IHÉS since 2000), Nikita NEKRASOV (at IHÉS since 2000). Alain CONNES is the Léon Motchane Professor at the Institute besides professor at the Collège de France.

The long term CNRS visitors are Ofer GABBER, Christophe SOULÉ, Dirk KREIMER and Christophe BREUIL, and Claire VOISIN will join soon. Among the former professors one finds Alexander GROTHENDIECK, Louis MICHEL, René THOM, Pierre DELIGNE, David RUELLE, Dennis SULLIVAN, Jürg FRÖHLICH, and Oscar LANFORD.

Researchers can work at IHÉS in total freedom (of the field studied and of the working methods adopted) and interact with scientists of different disciplines (mathematics, physics, biology, computer science...). This model draws on the spontaneity of exchanges and does generate tremendous cross-fertilisation.

Serving the international scientific community

Over the past twenty years, IHÉS has served over 5,000 researchers, drawn from a wide selection of nationalities and ethnic groups. During the last decade, the Institute has welcomed 2370 scientists from 60 countries. The sharing of research greatly advances the cooperation of scientists and the dissemination of knowledge gained when they return to their respective countries. Each year the Institute welcomes 200 to 300 visiting mathematicians, theoretical physicists, computer scientists, and biologists.

Visiting scientists are invited solely upon the criterion of excellence in their field. Since its creation in 1958, nearly all the Fields Medallists (45 out of 48) and all the theoretical physicists who received the Nobel Prize have spent time at the Institute.

The visiting professors' programme invites some of the world's most promising young mathematicians and physicists, encouraging their rapid development and their early contributions to fundamental research. The Scientific Council invites post-doctoral fellows whenever deemed appropriate, making sure that young talent is consistently present at the Institute with a view to create the best possible conditions for collaborative research.



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IHÉS further serves the mathematics and physics communities worldwide through its publications (including the *Publications Mathématiques de l'IHÉS*), website, on-site services to IHÉS visiting researchers, and in the conference and seminar programme at the Institute.

2006 – Year of Asia at IHÉS

In 2002, IHÉS decided to make specific efforts to reach out to Asia, in a first instance towards Japan and China, in recognition of these countries' key role in the field of science. These efforts are of course based on the already existing links between the Institute and Japanese and Chinese researchers.

The Board of Directors of the Institute decided to name 2006 the Year of Asia at IHÉS, and this was a great opportunity to hold a number of events, namely:

- Three French-Japanese conferences: one on “*Reaction-Diffusion Systems in the Life Sciences*” in collaboration with the University Paris-Sud; another one on “*Noncommutativity*” as a joint venture with the Mathematical Society of Japan, and also the Hayashibara Forum on “*Singularities*”;
- A tribute to Shiing Shen CHERN, which took the form of a series of testimonials;
- A public lecture by Professor Heisuke HIRONAKA at the Maison de la Culture du Japon à Paris, and
- A Summer School on Algebraic Geometry and Number Theory, which was a collaborative project involving IHÉS and several leading universities, research centres and other institutions in Japan, China, Taiwan, Korea, India, Vietnam and France.

IHÉS and the Japanese scientific community

Within the last ten years, 61 Japanese researchers have come and worked at IHÉS. Professor Heisuke HIRONAKA visited the Institute in 1959, making him the first ever visitor at the Institute. 40 years later, he noted how it had become a “Mecca for mathematicians”.

Just recently, in September 2007, the Seki Takakazu Prize was awarded to IHÉS by the



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Mathematical Society of Japan, in recognition of its role in the development of the links between the French and Japanese mathematical communities and more generally, in recognition of the Institute's significant achievements in the advancement of mathematical science.

The Japan Fund at IHÉS

Over the years, IHÉS has built up a close relationship with many Japanese universities and research institutes. Furthermore, in order to be able to secure proper financing in the future for more Japanese visitors, the Institute has decided to set up a special fund called the "IHÉS Japan Fund". The objective for this fund is to raise 2 millions Euros (some 333 millions Yens at the present rate), that will finance every year 24 months of visits to IHÉS by Japanese scholars on its financial products. The amount to be raised will be divided equally between French and Japanese private contributors.

The Japanese half will be collected with the Keidanren's support, under the chairmanship of Mr Fujio CHO, chairman of Toyota Motors, with the cooperation of several leading business leaders, Professor Heisuke HIRONAKA, and Mr Hisanori ISOMURA, former director of the Japan Culture Centre in Paris.

Donations have been approved by the Council for Better Corporate Citizenship for tax exemption.

Other key developments

Reaching out to new fields of work

Fundamental research can be approached in many different ways, some of them based on modelling, using mathematical and physical tools but naturally extending beyond these disciplines. Such fields as biology, medicine, high technology offer many challenges for the future. They are well suited to modelling, and therefore potentially subject to reinforced interaction with mathematics and theoretical physics.

IHÉS has started exploring new activities in these areas by offering researchers in various disciplines the interdisciplinary framework it has nurtured since its creation.



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Reaching out to young mathematicians and physicists

The European Post-Doctoral Institute for Mathematical Sciences (EPDI) was founded in October 1995 by IHÉS, the Isaac Newton Institute for Mathematical Sciences (Cambridge, United Kingdom) and the Max-Planck-Institut für Mathematik (Bonn, Germany), with the common goal of encouraging the mobility of young scientists on a European scale. There are now nine leading European research centres taking part in the programme, which offers postdoctoral visits of 6 to 12 month at EPDI institutes conducting scientific activities in their area of interest.

The itinerary candidates must submit with their application can also include, on top of stays at some the nine participating institutions, a visit to a Japanese institution provided the chosen institution is prepared to submit an application to the Japan Society for the Promotion of Science "Post-doctoral Fellowships for Foreign Researchers" programme.

Reaching out to sub-Saharan Africa

Since 2004, IHÉS, in partnership with the Schlumberger Foundation, has been running a programme supporting activities in fundamental science in sub-Saharan African countries. With this programme, conferences and workshops organised in Africa dedicated to senior and junior researchers have been supported. The programme covers travel and living expenses of African nationality researchers, working in an African country.

2008 will be IHÉS' golden jubilee year

IHÉS will be celebrating its 50th anniversary in 2008. A number of scientific events, and celebrations aimed at a wider audience are planned, together with the official launch of a new fundraising campaign, aimed at consolidating the institute's endowment funds and enabling the implementation of a number of key projects to further the advancement of fundamental research.

Some of these events will take place outside France. The venue for one such event is Tokyo in October 2008, combining a scientific conference, a forum with industrialists and a meeting with interested high school students.