

INSTITUT
DES HAUTES
ÉTUDES
SCIENTIFIQUES

A foundation in the public interest
since 1981

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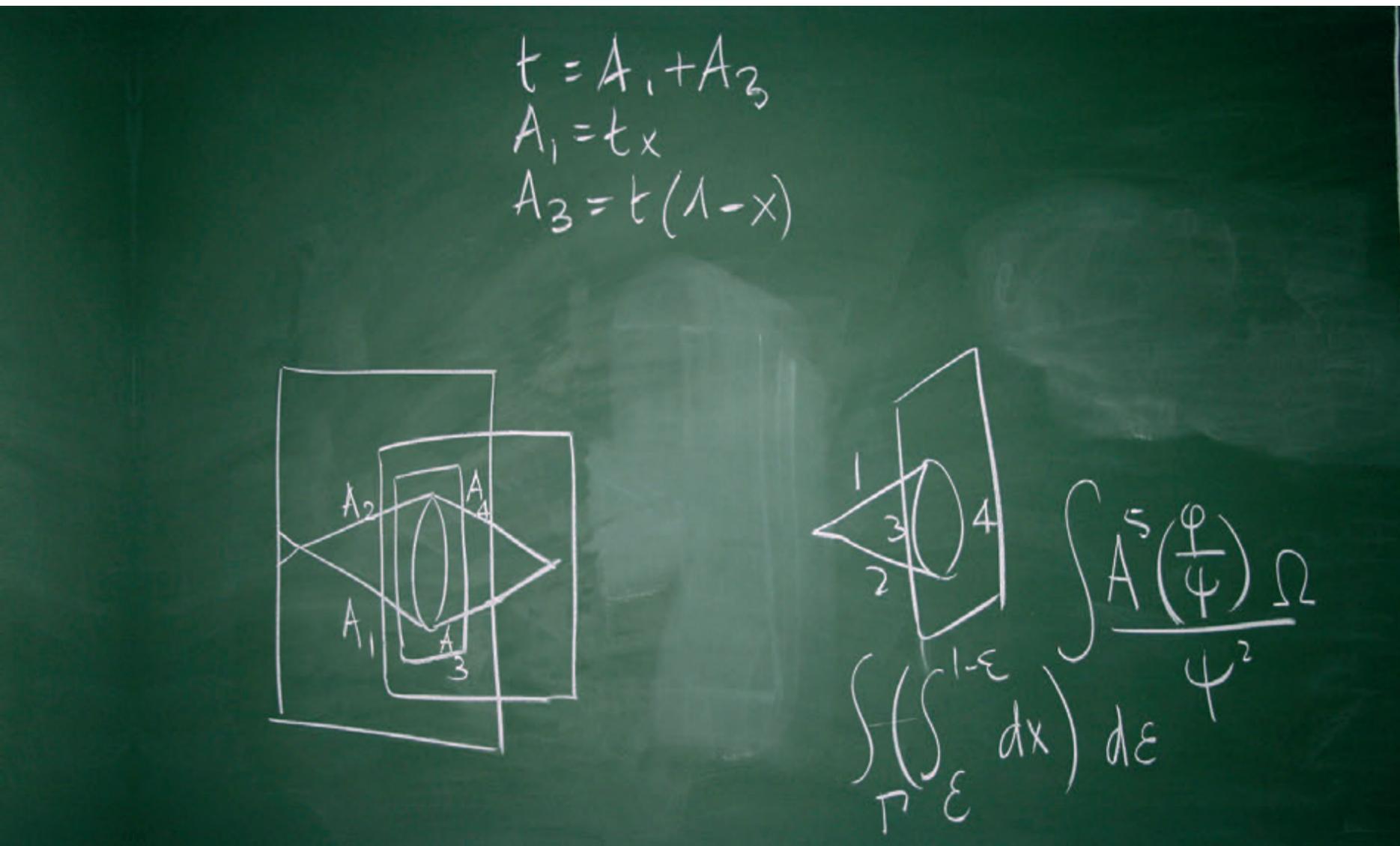


The Marilyn and James Simons Conference Center

“The aim of the Foundation known as ‘Institut des Hautes Études Scientifiques’ is to enable and encourage theoretical scientific research (...). [Its] activity consists mainly in providing the Institute’s professors and researchers, both permanent and invited, with the resources required to undertake disinterested research.”

Extract from the statutes of the Institut des Hautes Études Scientifiques, 1958.

A visionary project, for excellence in science



Editorial



Emmanuel Ullmo,
Mathematician, IHES Director

*A single scientific program: curiosity.
A single selection criterion: excellence.*

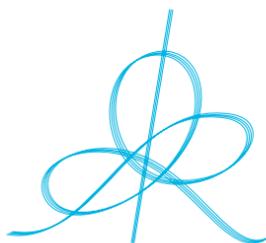
The Institut des Hautes Études Scientifiques is an international mathematics and theoretical physics research center. Free of teaching duties and administrative tasks, its professors and visitors undertake research in complete independence and total freedom, at the highest international level.

Ever since it was created, IHES has cultivated interdisciplinarity. The constant dialogue between mathematicians and theoretical physicists has led to particularly rich interactions. In more recent years, IHES has turned its attention to the interface between mathematics and biology and the theoretical issues arising from advanced technology.

A limited number of permanent professors and researchers from prominent French organizations (Collège de France, CEA and CNRS) are based at IHES. These very senior scientists attract some 200 visitors each year, who also benefit from the high concentration of mathematicians present in close proximity to the Institute. The scientific emulation resulting from the interactions between researchers in different disciplines and from different countries contributes to the vitality of basic research globally.

The Institute's originality also lies in its capacity to take scientific risks and I would like to thank here all those who have helped us maintain this unique model. IHES continues to seek new partners to share in what is both its essence and its success: giving the most prominent and the most promising researchers an opportunity to travel down as yet unexplored intellectual avenues.

Emmanuel Ullmo



The Institute's logo, chosen by its founder Léon Motchane, mingles the mathematical symbols for the empty set and infinity. It can be read as a metaphor for researchers' intellectual pursuit around the globe and throughout the ages.



When the Institute was founded, Léon Motchane (right) enlisted the emblematic support of Robert Oppenheimer (left), then Director of IAS. Oppenheimer joined the IHES scientific council and remained a member all his life.

7 FIELDS medals

One figure gives an idea of IHES' rank: of the ten past or current permanent professors at IHES, seven have been awarded the Fields medal, the highest distinction in mathematics:

- René Thom (1958)
- Alexander Grothendieck (1966)
- Pierre Deligne (1978)
- Alain Connes (1982)
- Jean Bourgain (1994)
- Maxim Kontsevitch (1998)
- Laurent Lafforgue (2002)

Founder

IHES was created in 1958 at a key stage in the history of science and the world. It was a time when the United States played a central role in research, whereas basic science in Europe was struggling to regain its global status.

Léon Motchane, a Russian businessman, loved mathematics to the extent that he submitted his doctoral thesis at the age of 54. Determined to offer exceptional scientists a place conducive to the unfettered development of their research, he took inspiration from the model of the Institute for Advanced Study (IAS) in Princeton and created IHES, dedicated to theoretical sciences, mathematics, physics and their interactions.

The first contributors, won over by this scientific project, came from both the public and the private sectors, in France and abroad. The wide range of the Institute's partners reflects lasting universal appeal.



have characterized the Institute ever since.

Although the Institute had only enough funding for a single-story scientific building, the IHES founder built... a second floor, leaving the first floor ready for further office space. This anecdote is a perfect illustration of the spirit of ingenuity, creativity, and long-range thinking that

1958

Léon Motchane creates IHES.

1959

The founder recruits **Jean Dieudonné** who works until 1964 in many fields, including group theory and functional analysis. **Alexander Grothendieck** also joins the Institute. Awarded the Fields medal in 1966, he remains at IHES until 1971. He completely reshapes the foundation of algebraic geometry and its methods.

1962

Louis Michel, joins IHES, where he spends 30 years. He is the first theoretical physics permanent professor and promotes the use of group theory in physics and in the study of symmetry.

1963

René Thom (1958 Fields medalist) is recruited by Léon Motchane and stays at IHES until the end of his career. He makes significant contributions to differential geometry and topology, then focuses his research on the role of singularities in morphogenesis and later on theoretical biology, linguistics and philosophy.

1974

Dennis Sullivan arrives at the Institute and remains until 1997. He creates algebraic models for topological spaces and contributes to the study of dynamical systems and of a topological approach to hydrodynamics.

1970

Pierre Deligne becomes a permanent professor and continues the work, started by Alexander Grothendieck, of transforming arithmetic geometry. He is awarded the Fields medal in 1978 and leaves IHES in 1984.

1964

David Ruelle* becomes a permanent professor of theoretical physics. He makes many lasting and important contributions to quantum field theory, statistical mechanics and the theory of the dynamical systems.

1978

Jürg Fröhlich becomes a permanent professor for 4 years. His research focuses mostly on quantum field theory.

1982

Oscar Lanford III joins IHES and stays 7 years, to work on the theory of dynamical systems, applying to these systems concepts arising from renormalization group theory. He also turns his attention to computer-assisted demonstrations and is responsible for IHES acquiring computer equipment for the first time.

1982

Mikhail Gromov* is recruited by IHES. In post at the Institute for over 30 years, he completely reshapes geometry. He is awarded the Kyoto Prize in 2002 and the Abel Prize in 2009, to name a few.

1985

Jean Bourgain joins the Institute and works on Banach spaces, harmonic analysis and ergodic theory. He is awarded the Fields medal in 1994 before joining IAS the same year.

1995

Maxim Kontsevich* arrives at the Institute. He belongs to a new generation of mathematicians who have been able to incorporate aspects of quantum theory into their work, opening up radically new perspectives. He is awarded the Fields medal in 1998 and many subsequent prizes: the Crafoord Prize (2008), the Shaw Prize (2012) and 2 Breakthrough Prizes in fundamental physics (2012) and in mathematics (2014).

1989

Thibault Damour* becomes a permanent professor. His research is on relativistic gravitation, cosmology and new concepts of gravitation. An Einstein specialist, he has received many awards, including the Einstein medal in 1996 and the Amaldi Prize in 2010.

2000

Laurent Lafforgue* joins the Institute; 2 years later, he is awarded the Fields medal. His work represents a major advance in the Langlands program. Also in 2000, **Nikita Nekrasov** becomes permanent professor of physics. A specialist in string theory, he works at the Institute for 12 years.

2014

Vasily Pestun*, a young physicist, is recruited as a permanent professor. He works on quantum field theory and string theory. He is awarded the Hermann Weyl prize in 2016.

2016

Hugo Duminil-Copin* becomes a permanent professor. He is a probabilist and his research also has an impact on mathematical physics, complex analysis and combinatorics.

● Mathematician

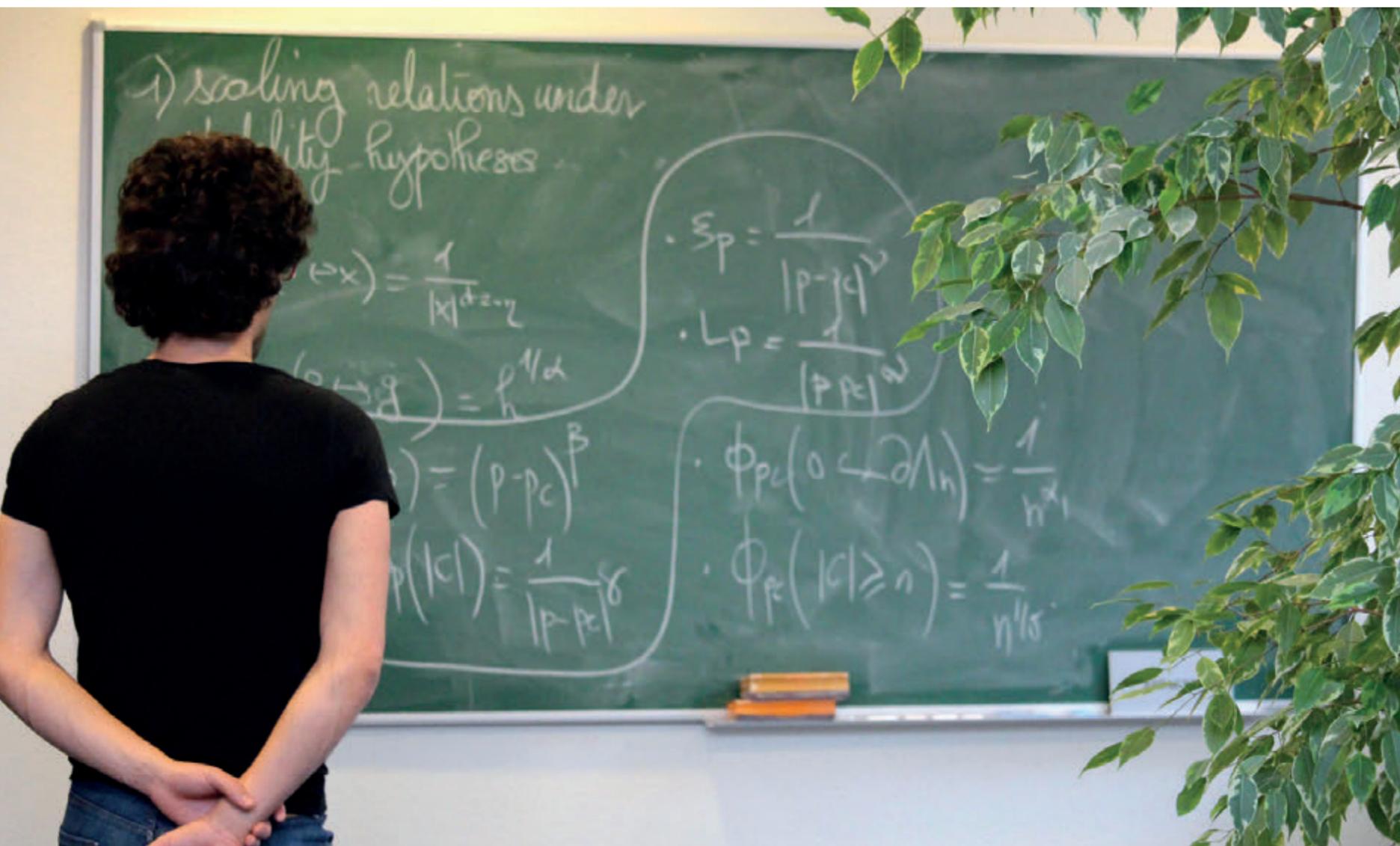
● Theoretical physicist

* Currently a professor at IHES

A modern-day Thelema for a global scientific community



14 PROFESSORS
7 PERMANENT, HONORARY
AND EMERITI PROFESSORS,
7 RESEARCH DIRECTORS



“To simplify, there are two stages in mathematical discovery. The first is when intuition cannot yet be formulated in such a way as to be transmissible rationally. At that point, vision is what counts! Not the static aspect of it but a kind of poetic driving force. This poetic force is almost impossible to put into words. Trying to convey it or say it almost turns it to stone, so to speak, and the momentum essential for discovery is lost. Things change later, when enough pieces of the puzzle are in place and it becomes apparent that the vision is translated into solutions for problems.”

Alain Connes
Léon Motchane Professor at IHES – Collège de France
Extract from *The Unravelers* (A K Peters/CRC Press)

Research

Driven by people rather than by programs, the research undertaken at IHES is characterized by its interdisciplinary nature. The five permanent professors have embodied the Institute's identity over the years; the 200 or so researchers invited each year ensure that different sources of inspiration abound, contributing to the scientific dynamism at IHES.

Carrying on with the ambition of its founder, IHES focuses on research in all the scientific disciplines related to basic science. The constant dialogue between mathematicians and physicists is one of the characteristics of scientific interaction at the Institute. IHES researchers also work on major contemporary issues such as the interface between biology and mathematics and the link between mathematics and its applications in industry.



205*
VISITORS



35*
NATIONALITIES

*On average in 2010-2015



516* MONTHS
OF VISITS

Visitors

The visitor program represents the Institute's most important scientific activity. Each year, around 200 researchers are selected by the Scientific Council after an application procedure. Drawn by the spontaneous and sometimes unexpected interactions that the Institute makes possible and encourages, visitors stay on average for 2.5 months.

The associated professor chairs: Israel Gelfand (mathematics), Louis Michel (theoretical physics) and René Thom (mathematics and biology) bear the name of famous scientists associated with the Institute. They enable high-profile researchers to work at the Institute for longer periods of time and provide them with the opportunity to conduct scientific activity as they see fit, inviting colleagues or organizing events, for instance.



The Bois-Marie site offers all visitors comprehensive research facilities, together with high-quality services. The quiet 10-hectare park is an invitation to deep thoughts and inspiring walks. In addition, the Ormaille residence offers accommodation to visitors, sometimes with their family. An optimal work environment enables researchers to focus solely on their work. IHES has gradually acquired the real estate that it needs to host researchers. These assets contribute to the Institute's endowment funds and its long-term mission.



International

Excellence is the privilege of no single nation and for the past half century, IHES has been a link in the global chain of knowledge. The Institute was created for researchers – both permanent and invited – who transcend the borders of mathematics and theoretical physics.

American researchers form the largest contingent of visitors at IHES and these scientific links have produced collaborative work at the highest level. The National Science Foundation's generous support to IHES since 1985 is further proof of fruitful French-American cooperation. In addition, IHES has put in place specific

programs to invite researchers from Asia and Sub-Saharan Africa.

Les Publications mathématiques de l'IHES is one of the most prestigious mathematical journals. It was created in 1959 by Léon Motchane and Jean Dieudonné, then permanent professor. Trilingual publication (English, French and German) and international distribution ensure a high level of visibility.

“To reach the limits of the possible, you have to dream the impossible.” René Thom

Events

The Institute's location – at the heart of the world's largest mathematical community – makes IHES a key facilitator in scientific life. Ranging from scheduled seminars to special conferences, the Institute's program of events is very busy, with over 200 presentations made by speakers from around the world each year.

Created by director Emmanuel Ullmo, the “Cours de l'IHES” program aims to present recent important scientific results in a range of fields in mathematics and theoretical physics. The speakers are permanent professors, CNRS and CEA research directors at IHES or researchers external to IHES, by invitation. Certain lectures form part of the graduate school programs in the Paris area.

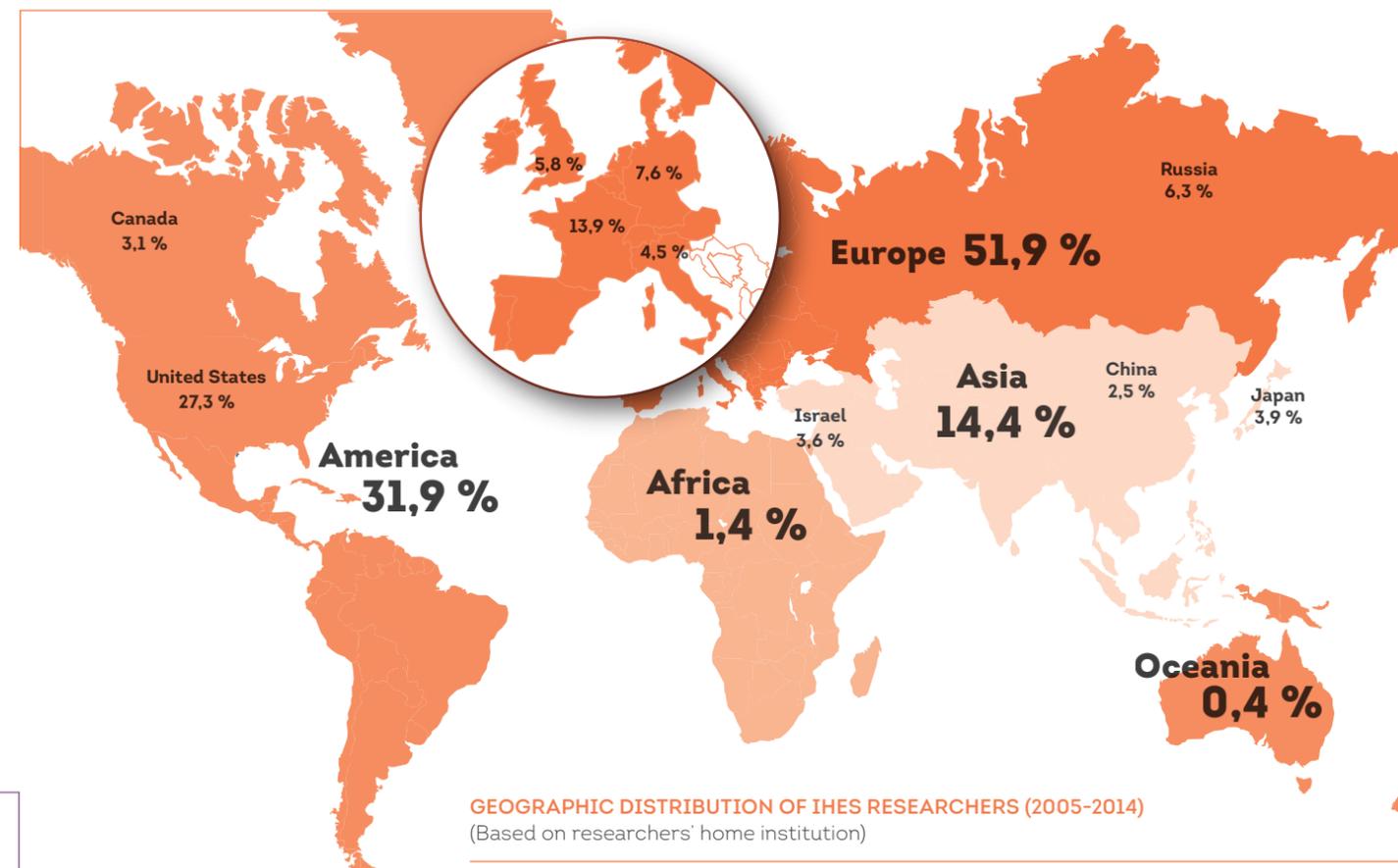
The Institute combines an international vocation with roots firmly in France and hosts many local events. IHES is committed to serving the entire French scientific community and is keen to reinforce existing interactions: it is a member of the Fondation mathématique Jacques Hadamard, of the CARMIN grouping, and also a founder member of Université Paris-Saclay.



255*
PRESENTATIONS
*in 2015



1 VIDEO LIBRARY
A comprehensive collection, providing access to unabridged videos of most scientific events at IHES



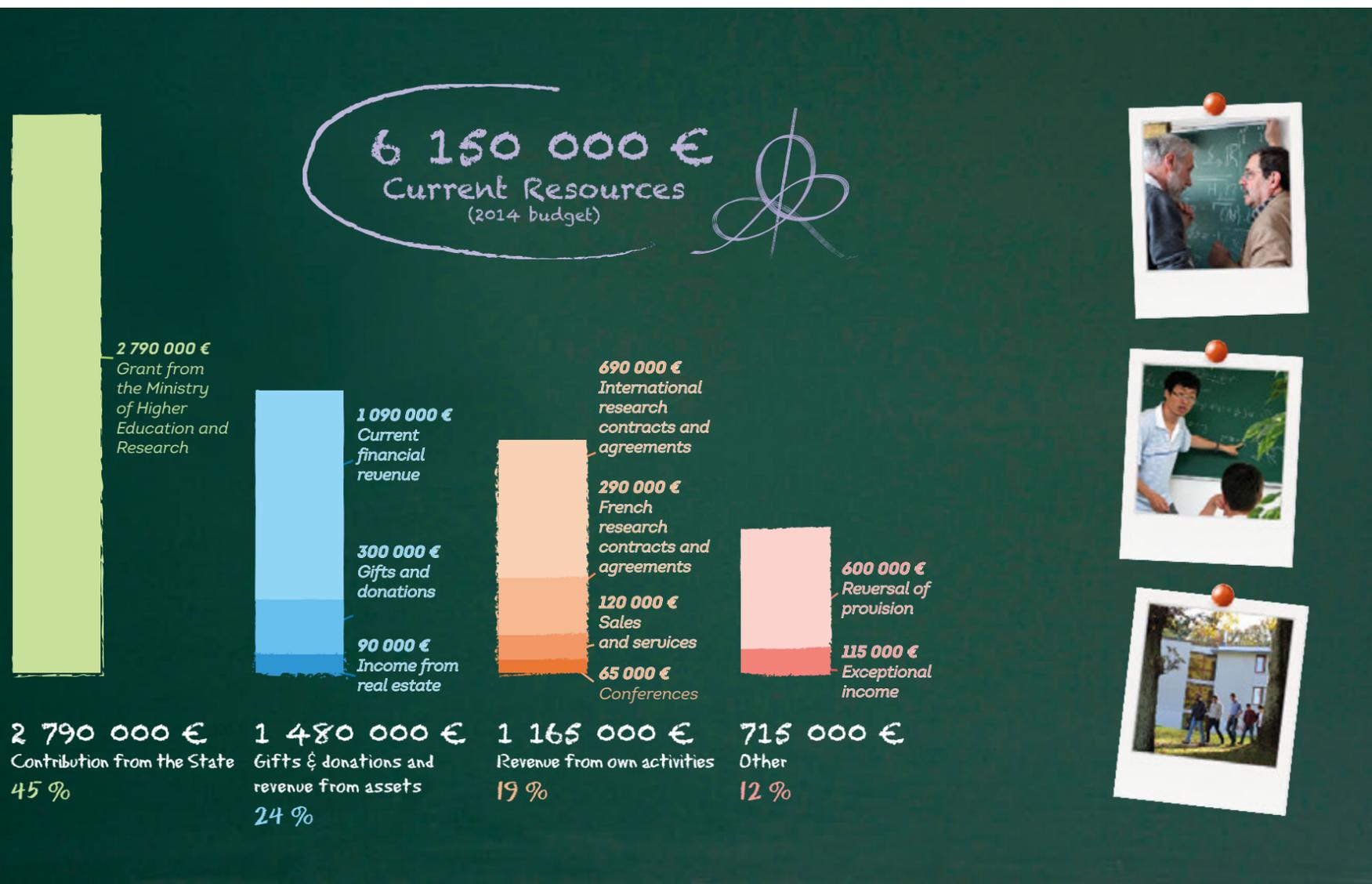
The séminaire de géométrie algébrique (1960-1969)

Under Grothendieck, the Institute hosted one of the most extraordinary mathematical seminars of all times, the “Séminaire de géométrie algébrique”. Its ambitious program of bringing together arithmetic, algebraic geometry and topology continues to structure contemporary mathematics.



The cosmopolitan nature of IHES is obvious at teatime. English, Russian and of course French, are the languages most often used to talk about theorems and discuss new concepts.

Independence and freedom, the Institute's two operational pillars



Governance



Marwan Lahoud,
Chairman of the IHES Board of Directors
Chief Strategy and Marketing Officer, Airbus Group

“ I know full well that fundamental research remains essential for industry. The power of the models designed by theorists regularly results in significant technological leaps. As well as the decisive part it plays in most technological innovations and its impact on economic players, fundamental research contributes to deep, universal thinking.

IHES is more than ever determined to play its part fully within the scientific ecosystem, by offering exceptional

scientists a place where their research can flourish. The scientific method is driven by a desire to push the boundaries of knowledge, which is also a desire for independence and freedom - two of IHES' core values.

IHES is one of the few places in the world to offer the scientific community the environment in which research - necessarily free and curiosity-driven - can flourish. We should preserve this model and support its development. ”

Budget

First as an association, and since 1981, as a foundation in the public interest, IHES has needed to find several funding streams to finance operations and ensure scientific development. From the start, Léon Motchane was able to build up a network of support, combining private partners and public institutions.

His successor, Nicolaas Kuiper, focused on securing funding from a number of foreign research institutions ready to contribute to its annual budget. In the late 1990s, under Jean-Pierre Bourguignon's directorship,

IHES set up a department dedicated to fundraising and conducted two successful international campaigns, a key outcome being the creation of endowment funds.

The Institute's essence is reflected in its current funding structure: a French research center with international influence.

IHES is managed by a Board of Directors comprising a maximum of 18 members. It meets twice a year and its membership includes founder representatives and individual members, together with representatives of the State (the Ministry of Research and CNRS).

An international support committee contributes to the Institute's fundraising activities. Its members are mainly business and industry leaders.

Lastly, the financial committee advises IHES on its asset management, especially the funds that have been endowed thanks to the generosity of the Institute's donors.

For its part, the Scientific Council (SC) has the prerogative of planning the Institute's scientific work at its twice-yearly meetings. It comprises ex-officio members (the director, the permanent professors, the Léon Motchane professor) and members who are co-opted for

a three-year mandate, renewable once. CNRS and CEA research directors at IHES and the holder of the Université de Cergy-Pontoise - IHES Analysis Chair are also invited to take part in discussions. The SC is responsible for recruiting permanent professors, as well as selecting invited researchers and organizing the program of scientific events.

Members

Scientific Council (alphabetical order)

- Michael Atiyah
- Costas Bachas
- Marcel Berger
- Jean Bourgain
- Jean-Pierre Bourguignon
- Robert Bryant*
- N. Cabidde
- Curtis Callan*
- Emmanuel Candès*
- Lennart Carleson
- Alain Connes*
- Thibault Damour*
- Pierre Deligne
- Bernard Derrida
- Stanley Deser
- Jean Dieudonné
- Simon Donaldson
- Bertrand Duplantier*
- Jean-Pierre Eckmann
- Hélène Esnault*
- Gerd Faltings
- Jürg Fröhlich
- Giovanni Gallavotti
- Raymond E. Goldstein
- Michael Green
- Mikhail Gromov
- Alexandre Grothendieck
- Gunter Harder
- Friedrich Hirzebruch
- Res Jost
- Maxim Kontsevitch*
- Nicolaas Kuiper
- Laurent Lafforgue*
- Oscar Lanford
- Joel Lebowitz
- Stanislas Leibler
- Hendrik Lenstra
- Yuri Manin
- Marc Mezard
- Louis Michel
- Paul Montel
- Jürgen Moser
- Léon Motchane
- Nikita Nekrasov
- Hermann Nicolai*
- Robert Oppenheimer
- George Papanicolaou
- Giorgio Parisi
- Rudolf Peierls
- Joseph Peres
- Francis Perrin
- Vasily Pestun*
- Luigi Radicati
- Michael Rapoport
- David Ruelle
- Peter Sarnak
- Graham Segal
- Raymond Stora
- Dennis Sullivan
- René Thom
- Emmanuel Ullmo*
- Gabriele Veneziano*
- Victor Weisskopf
- Don Zagier
- Christopher Zeeman
- Jean-Bernard Zuber

Board of Directors (chronological order)

Presidents

- Joseph Pérès, *Institut de France* (1958-1961)
- André Grandpierre, *Pont-à-Mousson* (1961-1972)
- Jacques Ballet, *Esso Standard France* (1972-1973)
- Raymond Barre, *Conseil général Banque de France* (1973-1977)
- Pierre Aigrain, *Thomson* (1977-1978)
- Renaud de la Genière, *Banque de France* (1978-1985)
- Marcel Boiteux, *Électricité de France* (1985-1994)
- Philippe Lagayette, *JP Morgan* (1995-2014)
- Marwan Lahoud, *Airbus Group* (depuis 2014)*

Ex officio Members

- CNRS*
- Ministère de l'Éducation nationale, de l'Enseignement supérieur et de la Recherche*

Founder members, organizations

- CEA*
- International Nickel Company
- Esso Standard France
- IBM World Trade Europe
- Électricité de France
- Saint-Gobain
- Engineering and Physical Sciences Research Council (UK)*
- Académie Suisse des Sciences Naturelles (S)*
- Max-Planck-Gesellschaft (G)*
- Fondation Européenne de la Science
- Service Public fédéral de Programmation, Politique scientifique (B)*
- SEMA Group
- Schlumberger Ltd*
- AXA*

Individual members

- M. Huvelin
- Gabrielle Reinach
- Fernand Picard
- Maurice Ponte
- Léon Kaplan
- Arnaud de Vogüé
- René Grandgeorges
- Vittorio Valletta
- Piero Giusiniani
- Harold W. Fisher
- Pierre Lelong
- Léon Motchane
- Francis Perrin
- Gérard Worms
- Edmond Malinvaud
- Cécile DeWitt-Morette
- Bernard Esambert
- Patricia Barbizet
- Jean-Paul Gimon
- Pierre Bonelli
- André Lévy-Lang*
- Isabelle Bouillot*
- Jean-Louis Beffa
- Isabelle Laudier*
- James Simons*

IHES Directors

- Léon Motchane (1958-1971)
- Nicolaas H. Kuiper (1971-1985)
- Marcel Berger (1985-1994)
- Jean-Pierre Bourguignon (1994-2013)
- Emmanuel Ullmo* (since 2013)

* Current member

Tax benefits

As a private research center, IHES needs partners to provide the resources supporting its work. Each donation to IHES takes research forward and attract a range of tax benefits for donors, depending on the country of their residence.

In France

The Institut des Hautes Etudes Scientifiques is a foundation officially recognized as being in the public interest according to French law. Any donation made by a French tax resident to IHES provide tax benefits to the donor:

For individuals

Income tax: 66% of donations made by individuals to the Institut des Hautes Études Scientifiques are tax deductible, provided they do not exceed 20% of the donor's taxable income.

If gifts exceed the 20% income limit, the donor may defer the tax deduction on the excess amount over the next five years.

"Impôt de solidarité sur la fortune": 75% of the gifts made to certain not-for-profit organizations such as IHES, up to a limit of 50 000€, are tax deductible for donors who pay this tax.

For companies

Payments made by companies to the Institut des Hautes Études Scientifiques result in a reduction in their corporate or income tax of 60% of the gift value. The limit beyond which it is no longer tax deductible is 0.5% of the company's turnover.

If the payments exceed 0.5% of turnover, or if the company is in deficit, it may defer tax deductibility over five years.

In the United States

Friends of IHES, Inc. is a public charity under Section 170 (b) (1) (A) (vi) of the Internal Revenue Code and exempt from Federal Tax under section 501 (c) (3), which enables US-based donors to benefit from tax deductions.

The objective of this organization, whose president is Michael R. Douglas is to increase the visibility of IHES in the United States, set up and coordinate the network of current and former American visitors at IHES, organize scientific or cultural events, and raise funds in favor of IHES.

Friends of IHES, Inc.
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New York, NY 10001
Email: info@friendsofihes.org

In Europe

Donors from a number of European countries wishing to making a gift are eligible for tax benefits via the *Transnational Giving Europe* (TGE) network. To make a gift, they should contact the following national foundations:

Germany: Maecenata International e.v.
Tel: +49 89 28 44 52 - Email: tge@maecenata.eu

Belgium: King Baudouin Foundation
Tel: +32 2 549 02 31 - Email: tge@kbs-frb.be

Bulgaria: Bulgarian Charities Aid Foundation
Tel: +359 2 981 19 01 - Email: tge@bcfa.org

Hungary, Slovakia, Romania: Carpathian Foundation International
Tel: +36 1 313 0451 - Email: tge@cfoundation.org

Ireland: Community Foundation for Ireland
Tel: +353 1 874 7354 - Email: tge@foundation.ie

Italy: Associazione Vita Giving Europe Onlus
Tel: +39 02 552298333 - Email: tge@vitagiving.org

Netherlands: Oranje Fonds
Tel: +31 30 656 45 24 - Email: tge@oranjefonds.nl

Poland: Foundation for Poland
Tel: +48 22 54 25 880 - Email: tge@fdp.org.pl

United Kingdom: Charities Aid Foundation
Tel: +44 17 32 52 03 32 - Email: tge@cafonline.org

Switzerland: Swiss Philanthropy Foundation
Tel: +41 22 732 55 54 - Email: tge@swissphilanthropy.ch

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