



The institute

The Institut Henri Poincaré (IHP) is an international research centre for mathematics and theoretical physics founded by Émile Borel. It is located in central Paris next to two other institutes founded in the 1920s, the Institut Curie and the Institut de biologie physico-chimique. The building facing it is Jean Perrin's former laboratory of physical chemistry, which is due to host in 2023 the Maison Poincaré, a maths museum and space for exhibitions and outreach.

- HISTORY
- MISSIONS
- GOVERNANCE
- SUPERVISORS AND PARTNERS
- IHP ENDOWMENT FUND

Video

The Institut Henri Poincaré revealed by its enthusiasts.

Special thanks to all the interviewees who kindly shared their experience at IHP for this film!

Annual reports

Discover below the **annual reports of IHP** since 2020.

Director's words

Find out about the life of the institute year after year as summarized by the management team.

The IHP team wishes you an inspiring year 2023.

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2022

We hope that many of you researchers, students, partners, and curious people, will follow our news and participate in exciting events dedicated to mathematics and its interactions. The year 2022 will see the completion of an extraordinary project in Perrin's building, which has been completely refurbished for IHP.

It will include more space for research and outreach, including a museum of mathematics called the Maison Poincaré.

We look forward to welcoming you there!

2021

The year 2020 used to be a horizon. It turned out to be world-shattering, including IHP. Still, the resilience of the team made this year intense and innovative.

The institute's expansion project previously known to the public as the "Maison des mathématiques 2020" found its final name, the Maison Poincaré. This is the official name of the future maths museum that will open by 2022 in the refurbished Perrin building.

The Maison Poincaré has also been formalized as IHP's department in charge of outreach activities. Thanks to the support of our supervisory institutions, we have been able to hire colleagues for most of the positions that were vacant in the new organizational chart.

The renovation of our current building is nearing completion. It includes an automatic video recording system in the lecture halls and various equipment facilitating remote work.



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The Institut Henri Poincaré is currently experiencing a profound transformation, twenty-five years after the re-foundation that conferred the status of 'unité mixte de service' between the CNRS and the university, at the time Paris VI and today Sorbonne Université.

One aspect of this transformation is rather a mutation, the mutation of its historical building. Built in 1928 under the leadership of Émile Borel, expanded twice over the decades, and renovated in the early 1990s, it is now being renovated to make it truly accessible to all and to improve the ergonomics of the first floor, both for visitors and for the staff in charge of welcoming them.

This work will be completed in 2020, around the same time as the refurbishment of the building opposite, which for 90 years was the site of the physical chemistry laboratory founded by Jean Perrin in 1926. After a successful cleaning phase in 2019, the large and beautiful spaces of this building were revealed to the privileged people who were able to visit it. The Perrin building, which is intended to become a major extension of IHP by 2021, will include offices, lounges and conference spaces dedicated to scientific exchange, as well as the Maison Poincaré, a space for exhibitions and outreach.

Sylvie Benzoni, January 2020.

Some highlights of the year 2019

Thematic trimesters

The mathematics of Imaging
Reinventing rational points

The Mathematics of Climate and the Environment

Outreach

Documentary film Man Ray and the Shakespearean Equations

Podcast L'oreille mathématique

Exhibition Sous la surface, les maths in Musée des arts et métiers

Partnership with Images des mathématiques / rebirth of the rubrique de l'IHP with interviews of researchers

Jam of chaos

Governance

Renewal of the IHP Board of directors, of its Scientific Advisory Board and of its Outreach Advisory Board.

Renewal of the LabEx CARMIN for the period 2020-2024.

2019

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The Institut Henri Poincaré (IHP) celebrated its ninetieth anniversary in November 2018, under the auspices of the institutions and partners that support its development and outreach projects. The IHP team and that of its endowment fund chose to wear on that occasion a colorful lavalier, reminiscent of the famous IHP former director and the graphical charter of the institute.

The year 2018 saw a wide variety of scientific events at IHP. In particular, the three thematic trimesters held in 2018 were very successful. The program on model theory attracted most of the researchers in the field from all over the world, the numerous participants being accommodated in a most professional manner by our staff. Both the trimesters on quantum systems and on cosmology gathered participants with very different backgrounds, involving mathematics and/or physics, theory, experimental and/or numerical approaches. Beside these long, thematic programs, numerous groups stayed and worked at IHP within the «Research in Paris» program. I express my gratitude to the program organizers for their hard work and to all participants for their involvement in making IHP such a lively and productive house, which is the very reason of its existence.

One of the crucial stakes for the institute is to enhance the outreach of these scientific activities through short documentaries, interviews and popularization articles. Regarding the latter we have been working in partnership with a website supported by the CNRS, Images des mathématiques. This work has been undertaken by Adrien Rossille, our new science communication officer since January 2019. The year 2019 will also see the release of our platform carmin.tv, a joint initiative with our partners in the 'Excellence Laboratory' CARMIN (CIMPA, CIRM, IHÉS, IHP). The French government has indeed agreed to continue CARMIN for five more years starting 2020, after its positive assessment by an international jury. Carmin.tv will gather all of the audio-visual production of the four partners on a shared web platform in order to enhance its visibility and reach a wider audience.

The organizers of scientific programs at IHP are warmly encouraged to offer public lectures, and also workshops towards companies whenever the theme is relevant for industrial applications. In this respect we had last year at least one public lecture per trimester, and the year 2019 has started successfully. The trimester on the Mathematics of imaging has indeed included three public lectures and three math-industry days, in cooperation with Amies (Agency for Interaction of Mathematics with Business and Society).

Regarding outreach, several remarkable exhibitions have been designed at IHP in 2018 in collaboration with external experts, and presented to the general public over several months. The most informed public has been able to see two historical exhibitions in our library. The first one was entitled 'Fourier, from the French Revolution to the digital revolution'. It has been successful enough to be shown in various ways in other cities, in particular in Grenoble to celebrate Joseph Fourier, famous there as a prefect. Another mathematician was celebrated in the library, through an exhibition entitled 'Gaston Darboux, the depth of surfaces'. This one was the counterpart of an exhibition more designed for the layman and that can be seen during the whole academic year 2018-2019 at the Musée des arts et métiers in Paris. Entitled 'Maths under the surface', it has been visited by hundreds of high-school students with their class, accompanied by a trained science communicator. Moreover, dozens of teachers have had the opportunity to visit the exhibition with its scientific curator. IHP has also been involved in the design of another exhibition, entitled 'As by chance' and currently displayed at the House of mathematics and computer science in Lyon.

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The documentary film that was announced last year will be released soon. Entitled 'Man Ray and the mystery of mathematics' and directed by Quentin Lazzarotto, audio-visual officer at IHP, this film is an invitation to dream and meet mysterious models. These have been kept at the Institute for the last ninety years, and entered the surrealist world by mere coincidence. Mathematics, photography, painting and literature are intertwined in this fascinating film, which will also include a few facetious moments. The support of our partners has been as crucial for this film to be realized as for the exhibitions to be produced.

A sixth season of the film club called 'Convergent Universe - Science, fiction, society' has started at the theatre Le Grand Action. On the last Tuesday of each month, IHP offers a dialog between scientists and the society in a friendly atmosphere. A glimpse of the program will convince you about the diversity of themes that are dealt with after the screening of movies, documentaries, or even series of short films, which will be a novelty this year. Those who cannot participate physically in the film club have the opportunity to watch the debate afterwards on the YouTube channel of IHP.

The house of mathematics and theoretical physics thus redoubles imagination while expanding its premises to be ever more welcoming and promote the production and transfer of scientific knowledge.

The refurbishment of the Perrin building will offer multiple spaces and rooms suitable for scientific interaction. This will undoubtedly improve the service offered to the national scientific community, who is used to drop by and work at IHP, a central and inspiring place. Thanks to this new building the Institute will be able to accommodate according to the best international standards even more scientific events, selected by its Scientific Advisory Board as being at the cutting edge of international research in mathematics, theoretical physics and their interactions with other fields.

Among the numerous projects of the new house of mathematics, the museography of the permanent exhibition in the Perrin building is being elaborated thanks to the commitment of many people with diverse backgrounds, including researchers, teachers, science communicators and engineers. Some museums and partner companies are also very much involved in the museographic project. We warmly acknowledge their support and thank all the people who share their ideas and give their time to contribute to the quality and the originality that will be necessary to ensure the success of the project.

Our museum's main attraction will be the 'room of Alice', where visitors will be able to experience HoloMath, an innovative way of exploring the world of mathematics based on augmented reality technology. This is an original idea by Cédric Villani. The first, exciting scenario that is being developed is about the notion of Brownian motion. Several other scenarios are in preparation on various topical themes. For these too the support of our partners is crucial.

The underlying idea in the museum, which will also offer rooms for temporary exhibitions and workshops, is to get the visiting researchers to interact with the general public and the students. The aim is to encourage those who produce new knowledge to popularize the scientific culture themselves.

The house of mathematics and theoretical physics thus faces many challenges. The whole staff of IHP and its endowment fund is committed together with Rémi Monasson, deputy director since March 2018, and myself to achieving the ambition of our renewed Institute.

Sylvie Benzoni, March 2019.

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Thanks to the large-scale actions led by Cédric Villani and Jean-Philippe Uzan in recent years in terms of research programmes of excellence and openness to the public and society, IHP now has a remarkable national and international influence in the fields of research in mathematics and theoretical physics, as well as with actors in the fields of education, audiovisuals and the dissemination of scientific culture.

It is with great pleasure that I joined this beautiful house and its extraordinary development project for 2020, which you could discover in the first chapter of the documentary "La Maison des mathématiques".

The stakes are high, since it is a question of doubling the surface area of the institute to both increase the spaces devoted to research and to offer reception conditions up to international standards, to design and fit out spaces dedicated to exhibitions and outreach activities open to the public, and moreover to create places of exchange with the sectors of the economy and industry.

In the spring of 2017, it was the architectural project of Atelier Novembre that was selected for the transformation of the Jean Perrin laboratory into the Maison des mathématiques. It perfectly reflects the search for harmony and balance between the different missions of the house and the desire to best meet the expectations of the target audiences. You have a nice overview in chapter 2 of the documentary, freshly released by our audiovisual service.

It remains now to accompany the transformation, not only from the material point of view but also as regards the implications from the human point of view of the evolution of the structure and its activities (intensification of the activities related to research on the one hand and reception of an increasingly numerous and diversified public on the other hand).

We are of course counting on the support of our supervisory institutions (CNRS and Sorbonne Université), our partners and our precious endowment fund, as well as the communities involved in the project.

The year 2018 is fully registered in the countdown to 2020. On the program of research trimesters this year, you will find themes at the interfaces of several disciplines, with model theory interacting with other fields of mathematics, quantum systems from the physical and mathematical point of view, and both analytical and statistical and numerical approaches to cosmology.

In addition, IHP will host this year many "Research In Paris": researchers from a wide range of fields will come and go, from algebraic geometry to partial differential equations, from number theory to spectral theory.

At the same time, the activities open to the public will not be outdone. The ciné-club Univers Convergents launches its 5th edition with a new formula, each session being sponsored by a passionate and exciting expert. The celebration of the centenary of the death of Gaston Darboux will continue with a double exhibition. This one will insist on the links between geometry and graphic arts during the last hundred years: the project "Surfaces: from Darboux to Pixar" will show in particular the role of Darboux in the constitution of the collection of mathematical models and the attraction exerted by these models on the surrealists, through a documentary devoted to Man Ray. The Sherlock Holmes-style mathematical investigations will continue to perfect our outreach approach. The first mixed reality scenario on Brownian motion, created this fall at the Palais de la découverte, will be relocated to the Pantheon and hopefully also to Lyon, for the exhibition being created by the Maison des mathématiques et de l'informatique.

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In short, a year that promises to be full of encounters, discoveries, interactivity, humour and surprises.

Sylvie Benzoni, January 2018.



INSTITUT HENRI POINCARÉ

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75231 Paris Cedex 05

TIMETABLE

The institute:

- Monday to Friday from 8:30am to 6pm,
- closed on public holidays.

The museum - Maison Poincaré :

- Monday, Tuesday, Thursday and Friday from 9:30am to 5:30pm,
- Saturday from 10am to 6pm,
- closed on Wednesday and Sunday.

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