

PRESS RELEASE

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Jean-François Le Gall, professor at the Orsay Mathematics Laboratory, is awarded the 2022 BBVA Foundation Frontiers of Knowledge in Basic Sciences award

The 2022 BBVA Foundation Frontiers of Knowledge award in Basic Sciences has been awarded to Jean-François Le Gall, Professor of Mathematics at Université Paris-Saclay and researcher at the Orsay Mathematics Laboratory (UPSaclay/CNRS). He shares the prestigious award with Charles Fefferman, Professor of Mathematics at Princeton University. The two laureates have been rewarded for opening “new perspectives in mathematical analysis and probability theory, which have had a great influence on a generation of mathematicians.”

The BBVA Foundation Frontiers of Knowledge award rewards Jean-François Le Gall and Charles Fefferman for their fundamental contributions which have led to important advances in mathematics, and created new applications in a wide range of fields in science and technology. They are recognised for having introduced powerful analysis techniques to solve longstanding maths problems, some of them arising from fundamental questions in theoretical physics.

Jean-François Le Gall is a specialist in probability theory. He works to establish a better understanding of random processes, including the famous Brownian motion, and other randomly chosen mathematical objects, such as random graphs.

At the start of his career, Jean-François Le Gall became interested in mathematical Brownian motion, a key object in probability theory. The study of Brownian motion dates back to Albert Einstein who was able to explain the random movement of pollen grains floating in water as the result of shocks with the molecules in the liquid, confirming the molecular nature of matter at a time when this was still being debated. Jean-François Le Gall has introduced and studied several key objects linked to Brownian motion, such as the Brownian snake, a random process which has an important role to play in the understanding of numerous probability models from combinatorics.

Over the past fifteen years, Jean-François Le Gall’s research has led to the development of a new branch of probability theory; Brownian geometry, which makes sense of a perfectly random surface, otherwise known as a Brownian sphere.

Jean-François Le Gall’s work has helped to strengthen links between different branches of mathematics, and with other scientific fields, in particular physics. His work demonstrates the crucial role mathematics has to play in our understanding of nature. “*Quantum mechanics, for instance, or relativity rely on deep mathematics. It is essential for science to start from sound mathematical models,*” he says.

Jean-François Le Gall was a research fellow at the CNRS from 1983 to 1988. He has been a professor at Université Paris-Saclay since 2006, and was head of the Probability and Statistics team at the Orsay Mathematics Laboratory (UPSaclay/CNRS) until 2019. He has been a member

of the French Academy of Sciences since 2013, and was also a senior member of the Institut Universitaire de France from 2007 to 2017. Jean-François Le Gall is the author of over 130 articles in scientific journals, and has been awarded numerous prizes and distinctions, including the Wolf Prize in Mathematics in 2019.

Established in 2008, the Frontiers of Knowledge awards are presented each year by the BBVA Foundation, in collaboration with the Spanish National Research Council (CSIC). They recognise and reward singular contributions in science, technology, the humanities and music, with a particular regard for those which significantly enlarge knowledge in a discipline, open up new fields, or build bridges between disciplinary areas. Each prize category comes with €400,000, a diploma and a commemorative artwork created by the artist Blanca Muñoz.

ABOUT UNIVERSITÉ PARIS-SACLAY

Université Paris-Saclay brings together ten constituent faculties and institutes, four Grandes Écoles, the Institut des Hautes Etudes Scientifiques, two associate institutions and shared laboratories with six national research organisations.

With 48,000 students, 8,100 lecturers and 8,500 administrative and technical staff members, Université Paris-Saclay offers a comprehensive and varied range of undergraduate to doctorate level programmes and engineering degrees, renowned for their quality thanks to the reputation and commitment of the University's academic staff.

Located in the south of Paris on vast sites that stretch across Paris, Orsay, Évry and Versailles, Université Paris-Saclay benefits from a strategic geographical and socio-economic position that is strengthened by its international visibility. A leading university, Université Paris-Saclay is recognised for its excellent Mathematics and Physics programmes but also for Biological and Medical Sciences, Agriculture, Engineering, and its extensive Humanities and Social Sciences courses. Close to Paris, Université Paris-Saclay is nested in a protected natural area, at the heart of a dynamic economic hub.



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ABOUT THE CNRS

The French National Center for Scientific Research is one of the most recognized and renowned public research institutions in the world. For more than 80 years, it has continued to attract talent at the highest level and to nurture multi-disciplinary and interdisciplinary research projects at the national, European and international levels. Geared towards the public interest, it contributes to the scientific, economic, social and cultural progress of France.

The CNRS is above all 32,000 women and men, more than 1,000 laboratories in partnership with universities and other higher education institutions bringing together more than 120,000 employees and 200 professions that advance knowledge by exploring the living world, matter, the Universe, and the functioning of human societies. The CNRS ensures that this mission is carried out in compliance with ethical rules and with a commitment to professional equality. The close relationship it establishes between its research missions and the transfer of acquired knowledge to the public makes it today a key player in innovation in France and around the world. Partnerships with companies are at the heart of its technology transfer policy, and the start-ups that have emerged from CNRS laboratories bear witness to the economic potential of its research. The CNRS provides also access to research findings and data, and this sharing of knowledge targets many audiences: scientific communities, the media, decision-makers, economic players and the general public. For more information: www.cnrs.fr