

# Mathematics People

## García Ferrero Awarded Rubio de Francia Prize 2019



María Ángeles  
García Ferrero

María Ángeles García Ferrero of the University of Heidelberg has been awarded the 2019 José Luis Rubio de Francia Prize by the Royal Spanish Mathematical Society (RSME) for her work in the field of partial differential equations and, in particular, her theory of global approximation for the heat equation and its application to the study of hot spots and isothermal surfaces, developed in collaboration with Alberto Enciso and Daniel Peralta. García Ferrero received her PhD in mathematics from the Complutense University of Madrid and then became a post-doctoral researcher at Max Planck Institute for Mathematics in the Sciences in Leipzig, Germany. Her interests include complex problems that analyze not only different aspects of differential equations but also important issues of topology, differential geometry, mathematical physics, and their applications. She tells the *Notices*: “I love reading and one of my favorite topics is nautical stories. Water striders were one of the last reasons which made me to decide to study physics. In a beautiful problem in the Spanish Physics Olympiad, we had to estimate their weight.”

The award carries a cash award of 3,000 euros (approximately US\$3,600) and a grant from the BBVA Foundation of 35,000 euros (approximately US\$42,000) to support three years of research by the prize awardee.

The prize honors the memory of renowned Spanish analyst José Luis Rubio de Francia (1949–1988) and is awarded annually to a mathematician from Spain or who has received a PhD from a university in Spain and who is at most thirty-two years of age, for high-caliber contributions to any area of pure or applied mathematics.

—From an RSME announcement

## 2020 Dirac Medals Awarded



André Neveu



Pierre Ramond

The International Centre for Theoretical Physics (ICTP) has awarded the Dirac Medals for 2020 to three researchers whose work involves the mathematical sciences. **André Neveu** of the University of Montpellier, France, **Pierre Ramond** of the University of Florida, and **Miguel Virasoro** of the Universidad Nacional de General Sarmiento, Argentina, were honored “for their pioneering contributions to the inception and formulation of string theory which introduced new Bosonic and Fermionic symmetries into physics.” Neveu works in string theory and quantum field theory. He was educated at École Normale Supérieure and held positions at Princeton University, the Institute for Advanced Study, École Normale Supérieure, and CERN. Ramond is considered the initiator of

the development of superstring theory. He completed the Bosonic string theories available in the early 1970s with Fermionic strings, generalizing the Virasoro algebra to a superconformal algebra, called the Super Virasoro algebra. He has held positions at Yale University and the California Institute of Technology. He was awarded the Dannie Heineman Prize for Mathematical Physics in 2015. Virasoro is well known for his research in theoretical physics and mathematical physics. He has held positions at the University of Wisconsin, the University of California, Berkeley, the Institute for Advanced Study, and the École Normale Supérieure. He taught for thirty years at Università di Roma “La Sapienza.” He is known for his discovery of the Virasoro model, a closed string model, as well as the introduction of the Virasoro algebra, a crucial tool in string theory.

—From an ICTP announcement

## Australian Academy of Science Awards



Jennifer Flegg

The Australian Academy of Science has honored three researchers whose work involves the mathematical sciences. Two researchers were awarded Christopher Heyde Medals. **Jennifer Flegg** of the University of Melbourne was honored for her work developing “predictive statistical models in space and time for the level of drug resistance” in malaria. She also develops mathematical models “to describe and help understand the ways that cells and chemicals interact with each other during the healing of a skin wound.” Flegg tells the *Notices*: “In my spare time, I’m kept pretty busy with two young children.” **Ryan Loxton** of Curtin University was honored with a Heyde Medal for “pioneering new mathematical algorithms for optimizing complex systems in a wide range of applications such as mining, robotics, agriculture, and industrial process control.” He has collaborated with many companies, and his work has led to “innovative mathematical techniques for solving real-world problems, such as providing algorithms for a quantum technology platform that optimizes the sequence and timing of maintenance activities in mine plant shut-downs.” The 2020 Fenner Medal was awarded to **Michael Bode** of the Queensland University of Technology for his work developing “new mathematical theory and tools to better understand the Earth’s threatened ecosystems to more effectively conserve them into the future.” Bode has used mathematical logic “to convince scientists and managers to rethink conservation dogma and decision-making approaches to conservation across the world, especially of coral reef ecosystems. His marine science work has focused on developing new statistical tools to measure dispersal patterns and new mathematical theories to understand the implications of these patterns.”

—From an Australian Academy of Sciences announcement

## 2020 Davidson Fellows

Two high school students whose projects involved the mathematical sciences have been named 2020 Davidson Fellows.



Lev Kruglyak

**Lev Kruglyak** of Irvine, California, received a US\$25,000 scholarship for his project “The Rational Cherednik Algebra of Type  $A_1$  with Divided Powers.” His project studied a class of mathematical objects called rational Cherednik algebras, which appear in the intersection of algebraic geometry, representation theory, and mathematical physics. After taking a year to intern as a software engineer, he plans to attend Harvard University in 2021 to study pure mathematics. His interests include wrestling on his high school varsity team, tutoring math at the Russian School of Mathematics, and hiking and biking the various mountain trails in Orange County.



Jason Liu

**Jason Liu** of Reno, Nevada, was awarded a US\$10,000 scholarship for his project “Quantum Integer-Valued Polynomials.” His project works with  $q$ -deformations: essentially, the study of the properties of various mathematical objects (such as integers, factorials, and polynomials) after an extra variable  $q$  is introduced to them. He recently graduated from the Davidson Academy in Reno and plans to attend the Massachusetts Institute of Technology in the fall to study mathematics, computer science, and physics. This project was a finalist in the Regeneron Science Talent Search. He plays piano, both classical Western and traditional Chinese pieces.

The Davidson Fellows program, a project of the Davidson Institute for Talent Development, awards scholarships to students eighteen years of age or younger who have created significant projects that have the potential to benefit society in the fields of science, technology, mathematics, literature, music, and philosophy.

—From a Davidson Fellows announcement

## Prizes of the Mathematical Society of Japan

The Mathematical Society of Japan (MSJ) has awarded several prizes for 2020. The Autumn Prize was awarded to **Masaaki Umehara** and **Kotaro Yamada**, both of the Tokyo Institute of Technology, for outstanding contributions to differential geometry of surfaces with singularities and surfaces in Lorentz–Minkowski space. The Autumn and Spring Prizes are the most prestigious prizes awarded by the MSJ to its members. The Autumn Prize is awarded without age restriction to people who have made exceptional contributions in their fields of research.

The Analysis Prizes were awarded to **Hirokazu Ni-nomiya** of Meiji University for the study of higher dimensional pattern dynamics by singular limit analysis; to **Kengo Matsumoto** of Joetsu University of Education for the study of symbolic dynamical systems and  $C^*$ -algebras; and to **Hideki Miyachi** of Kanazawa University for the study of complex analysis on Teichmüller space.

The Geometry Prize was awarded to **Mikiya Masuda** of Osaka City University for studies on transformation groups focused on toric topology.

Takebe Katahiro Prizes were awarded to the following individuals: **Yuya Matsumoto**, Tokyo University of Science, for research on  $K3$  surfaces in mixed and positive characteristic; **Shinichi Matsumura**, Tohoku University, for complex analytic studies on vanishing theorems and their applications to geometry; and **Hirokazu Saito**, University of Electro-Communications, for mathematical analysis of free boundary problems arising in fluid mechanics.

Takebe Katahiro Prizes for Encouragement of Young Researchers were awarded to the following individuals: **Masato Hashizume**, Hiroshima University, for study on the loss of compactness phenomena of noncompact variational problems; **Yosuke Kubota**, Shinshu University, for applications of operator  $K$ -theory in geometry; **Yuta Kusakabe**, Osaka University, for studies on Oka manifolds and ellipticity; **Shohei Nakamura**, Saitama University, for applications of various inequalities in harmonic analysis to open problems; **Yohei Sakurai**, Tohoku University, for comparison geometry and geometric analysis on Riemannian manifolds with boundaries; and **Daichi Takeuchi**, University of Tokyo, for study on epsilon factors of  $\ell$ -adic sheaves.

—From MSJ announcements

## Royal Society of Canada Elections

The Royal Society of Canada (RSC) has elected eighty-seven new Fellows in the Academies of Arts and Humanities, Social Sciences, and Science for 2020. The new Fellows whose work involves the mathematical sciences follow.

**Askold Khovanskii** of the University of Toronto “is an internationally recognized scientist whose research has had a great impact on the mathematical and computer sciences communities. His solutions of deep and complex problems seem simple and natural. He created topological Galois theory (a totally new branch of classical Galois theory) and the highly original theory of fewnomials (in complexity theory). He is one of the creators of the theories of Newton polyhedral and of Newton–Okounkov bodies.”

**Bojan Mohar** of Simon Fraser University “is a world-leading graph theorist who has deeply contributed to central areas in discrete mathematics. His deep and fundamental results advanced algebraic, structural, and topological graph theory and influenced theoretical computing, mathematical chemistry, and other fields.” His awards and honors include the Euler Medal of the Institute of Combinatorics and its Applications (ICA) and the John L. Synge Award of the RSC. He is a Fellow of the AMS and the Society for Industrial and Applied Mathematics (SIAM).

**Louis-Paul Rivest** of the University of Laval “is an applied statistician holding a Canada Research Chair in Statistical Sampling and Data Analysis. He is a pioneer of the mathematical theory of copulas for modeling stochastic dependence. His works in multivariate analysis, in directional statistics, on capture–recapture models and in survey sampling have had a fundamental impact on the applications of statistical sciences in finance, in actuarial sciences, in social statistics, in environmental science, and in biomechanics.”

**Zhangxing Chen** of the University of Calgary holds the NSERC/Alberta Innovates/Energy Simulation Senior Industrial Research Chair. His group uses modeling and simulation to develop new, more economical, and more sustainable ways to recover heavy oil and oil sands resources. His “exceptional work has led to the establishment of the most prominent collaborative consortium and a spin-off company.” He was awarded the CAIMS-Fields Industrial Mathematics Prize in 2018. He is also a recipient of the Synergy Award for Innovation of the Natural Sciences and Engineering Research Council of Canada. He is a Fellow of the Canadian Academy of Engineering and the Engineering Institute of Canada.

**Alla Sheffer** of the University of British Columbia “is a world leader in computer graphics and geometry processing.” She develops “innovative methods for modeling

shapes that facilitate computational fabrication, garment design, computer animation, and mechanical engineering. Her methods, some of which had been incorporated into major modeling software packages, enable computer animators, designers, and artists to easily generate and manipulate computer models of complex real-world and imaginary shapes.”

—From an RSC announcement

## NDSEG Graduate Fellowships

The National Defense Science and Engineering Graduate Fellowships program has awarded its fellowships for 2020. The fellows in the mathematical sciences follow, along with their planned graduate institutions and the agency granting the fellowships.

### Mathematics

- **Mallory Gaspard**, Cornell University, Army Research Office (ARO)
- **Matthew Larson**, Stanford University, Air Force Office of Scientific Research (AFOSR)
- **Frederick Law**, New York University, AFOSR
- **Douglas Stryker**, Princeton University, AFOSR
- **Sarah Sundius**, Georgia Institute of Technology, ARO

### Computer and Computation Sciences

- **Alex Hanson**, University of Maryland, College Park, Office of Naval Research (ONR)
- **Samuel Judson**, Yale University, ONR
- **William Kretschmer**, University of Texas, Austin, ARO
- **Cassidy Laidlaw**, University of California, Berkeley, ARO
- **Randolph Linderman**, Duke University, AFOSR
- **Benjamin Miller**, University of Texas, Austin, AFOSR
- **Yue Niu**, Carnegie Mellon University, AFOSR
- **John San Soucie**, Massachusetts Institute of Technology, ONR
- **Vishnu Sarukkai**, Stanford University, ARO
- **Martin Schneider**, Massachusetts Institute of Technology, ARO
- **Katherine Skocelas**, Michigan State University, AFOSR
- **Maya Varma**, Stanford University, AFOSR
- **Jack Wang**, Cornell University, AFOSR
- **Matthew Weidner**, Carnegie Mellon University, ONR

—NDSEG announcement

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Mathematical and  
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**DOCTORAL RECIPIENTS**  
New PhD graduates, their employment plans, demographics, and starting salaries

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**DOCTORAL DEGREES & THESIS TITLES**  
PhD graduates, their thesis titles, and where they earned their degrees

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**FACULTY SALARIES**  
By rank and employment status

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**RECRUITMENT & HIRING**  
The academic job market

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**DEPARTMENTAL PROFILE**  
The number of—faculty, their employment statuses and demographics; course enrollments; graduate students; masters and bachelors degrees awarded

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