

Mathematics People

Dickenstein and Goldwasser Receive International Awards for Women in Science



Alicia Dickenstein

Alicia Dickenstein of the University of Buenos Aires and **Shafi Goldwasser** of the University of California, Berkeley, the Massachusetts Institute of Technology, and the Weizmann Institute of Science have been awarded the 2021 L'Oréal-UNESCO for Women in Science International Awards in Mathematics and Computer Science, respectively.



Shafi Goldwasser

Dickenstein was recognized “for her outstanding contributions at the forefront of mathematical innovation by leveraging algebraic geometry in the field of molecular biology. Her research enables scientists to understand the structures and behavior of cells and molecules, even on a microscopic scale. Operating at the frontier between pure and applied mathematics, she has forged important links to physics and chemistry and enabled

biologists to gain an in-depth structural understanding of biochemical reactions and enzymatic networks.” Dickenstein received her PhD from the University of Buenos Aires in 1983 under the direction of Miguel Herrera. She has been Eisenbud Professor at the Mathematical Sciences Research Institute (MSRI; 2009–2010) and was Simons Professor there from 2012 to 2013. In 2016 she was the Knut and Alice Wallenberg Professor at KTH Royal Institute of Technology. She is currently a Simons Associate at the International Centre for Theoretical Physics (ICTP), as well as professor at Buenos Aires. She received the TWAS Prize of the World Academy of Sciences in 2015. She was vice president of the International Mathematical Union from 2015 to 2018. She was named a Fellow of the AMS in 2019 and a Fellow of the Society for Industrial and Applied Mathematics (SIAM) in 2020. Dickenstein is the coauthor (with

Juan Sabia) of *Matemax* (AMS, 2020), a bilingual English/Spanish mathematics book for ten- to fourteen-year-old children. She loves that math “is a very democratic human activity, because we all think the same way, regardless of race, gender, age, or social status.”

Goldwasser was honored “for her pioneering and fundamental work in computer science and cryptography, essential for secure communication over the Internet, as well as for shared computation on private data. Her research has a significant impact on our understanding of large classes of problems for which computers cannot efficiently find even approximate solutions.” Goldwasser received her PhD in computer science in 1984 from the University of California, Berkeley, under the supervision of Manuel Blum. She joined the Massachusetts Institute of Technology in 1983, and in 1993 she concurrently became a professor at the Weizmann Institute. Among her honors are the Gödel Prize in theoretical computer science (1993 and 2001), the RSA Award for Excellence in Mathematics (1998), the Morris L. Levinson Prize in Mathematics (1999), and (with Silvio Micali) the 2012 Turing Award. She is a member of the National Academy of Sciences, the American Academy of Arts and Sciences, and the London Mathematical Society and a Fellow of the Association for Computing Machinery. She was named director of the Simons Institute for the Theory of Computing at Berkeley in 2018.

The L'Oréal-UNESCO for Women in Science International Awards are presented every year to five outstanding women scientists—one each in the following regions: Africa and the Arab States, Asia and the Pacific, Europe, Latin America and the Caribbean, and North America—in recognition of their scientific accomplishments.

—From a L'Oréal-UNESCO announcement

Wong Awarded Birman Fellowship



Helen Wong

Helen Wong of Claremont McKenna College is the recipient of the AMS Joan and Joseph Birman Fellowship for Women Scholars for 2021–2022.

Wong's research is in quantum topology and applications of topology. Her quantum topology work seeks to understand how quantum invariants (like those related to the Jones polynomial or Witten–Reshetikhin–Turaev quantum field theory) capture

topological and geometric information about knots and 3-manifolds. Recently she has focused on the Kauffman bracket skein algebra of a surface, which is closely related to the hyperbolic geometry of that surface through the Teichmüller space. In particular, with collaborators she discovered unexpected algebraic properties of the skein algebra and used them to give an explicit correspondence between the representations of the skein algebra and quantizations of Teichmüller space. Wong's applied topology work includes research in topological quantum computation and in the study of entanglement of biopolymers.

Wong was born and raised in the Los Angeles area and obtained her BA from Pomona College. While an undergraduate, she explored many majors, including chemistry and music, but fell in love with topology at the Summer Institute in Mathematical Sciences for Undergraduate Women (SIMS) at the University of California, Berkeley. She deferred her enrollment in the PhD program in mathematics at Yale University to spend a year at the Budapest Semesters in Mathematics program with a Fulbright Scholarship. She finished her PhD in 2007 under the direction of Andrew Casson. After a two-year postdoctoral fellowship at Bowdoin College, she accepted a position as assistant professor at Carleton College, where she received tenure in 2016. She was the von Neumann Fellow at the Institute for Advanced Study in 2017–2018 and became an associate professor at Claremont McKenna College in the fall of 2018. After a pandemic year juggling work while at home with her two young children, Wong is very thankful for the support of a Birman Fellowship to be able to have dedicated time and space to focus on her research.

The AMS Joan and Joseph Birman Fellowship for Women Scholars, established in 2017 with a generous gift from Joan and Joseph Birman, seeks to give exceptionally talented women extra research support during their mid-career years. The primary selection criterion for the Birman Fellowship is the excellence of the candidate's research.

Read an interview (www.ams.org/giving/honoring/the-line-newsletter-fall2017-PDF.pdf) with Joan Birman about her decision to create the Fellowship with the goal of "helping more women mathematicians to develop their creative voices."

The first three Birman Fellows were Margaret Beck (2018–2019), Lillian Pierce (2019–2020), and Karin Melnick (2020–2021). For more information about the Fellowship, see www.ams.org/Birman-Fellowship.

—Elaine Kehoe

Csörnyei Awarded Noether Lectureship



Marianna Csörnyei

Marianna Csörnyei of the University of Chicago has been awarded the Emmy Noether Lectureship for 2022 by the Association for Women in Mathematics (AWM) and the AMS. She will deliver the prize lecture at the 2022 Joint Mathematics Meetings in Seattle, Washington.

The prize citation reads: "Csörnyei has made significant contributions to several areas of mathematical analysis, including geometric measure theory, functional analysis, and real analysis. While she was still an undergraduate, she established a reputation as a brilliant problem solver, continuing her success from high school when she won a gold medal at the International Mathematical Olympiad. Later, she worked on deep, innovative long-term projects. She is known, for example, for her results concerning various versions of the Kakeya needle problem and for her work on the structure of Lebesgue null sets in Euclidean spaces. The latter work is connected to questions concerning the possibility/impossibility of strengthening the Rademacher Theorem about the almost everywhere differentiability of Lipschitz functions, problems in partial differential equations and the calculus of variations, as well as to some combinatorial problems."

Csörnyei received her PhD from the Eötvös Loránd University in Budapest in 1999. Before joining the faculty at the University of Chicago, she was a research fellow at University College London from 1999 to 2003, a member of the Institute for Advanced Study in Princeton during the 2003–2004 academic year, and a professor of mathematics at University College London from 2004 to 2011. She held a visiting professorship at Yale University in 2009–2010.

Csörnyei's honors include the Whitehead Prize of the London Mathematical Society and the Royal Society

Wolfson Research Merit Award, both in 2002. In 2008 she was awarded the Philip Leverhulme Prize for her work in geometric measure theory. In 2019 she was elected an external member of the Hungarian Academy of Sciences. She was an invited speaker at the 2010 International Congress of Mathematicians and has given lectures at distinguished institutions around the world. She tells the *Notices*: “My favorite hobbies are hiking, gardening, skiing, and everything else that has to do with the outdoors. I also love theater, and classical music, and art exhibitions (but these days, these possibilities are unfortunately very limited).”

The AWM established the Emmy Noether Lectures in 1980 to honor women who have made fundamental and sustained contributions to the mathematical sciences.

—From an AWM announcement

Girault Awarded Kovalevsky Lectureship



Vivette Girault

Vivette Girault, professor emeritus at Sorbonne Université, CNRS, Laboratoire Jacques-Louis Lions, has been named the 2021 Sonia Kovalevsky Lecturer of the Association for Women in Mathematics (AWM) and the Society for Industrial and Applied Mathematics (SIAM). She will deliver her lecture (in hybrid or virtual format) at the SIAM Annual Meeting in Spokane, Washington, in July 2021.

The prize citation reads: “Vivette Girault is an outstanding numerical analyst with a long and distinguished career, who continues to have both deep and broad impact on computational science. Her work in finite element methods, computational fluid dynamics, and mechanics is widely known and has been highly cited. The letters in support of this nomination suggest that what sets Professor Girault apart from others is her ‘uncompromising attitude towards making sure that she fully understands the underlying physics of the problems she works on,’ and this assessment explains her broad influence within as well as outside numerical analysis. Professor Girault has also been a fantastic mentor and role model for many junior mathematicians, being ‘quick-witted, rigorous, and excellent, with a radiant and humble personality.’”

Girault was born in Nice, France, attended high school in Caracas, Venezuela, and received her undergraduate degree from McGill University in Montreal, Canada. She then returned to France to study numerical analysis and was appointed assistant professor of applied mathematics at the Université de Paris (renamed the Université Pierre

et Marie Curie (UPMC), and now known as Sorbonne Université). Except for two years spent at the University of Houston, Girault’s career was spent at UPMC. Since retiring from UPMC in 2008, Girault has held visiting positions at the University of Pittsburgh, the University of Texas at Austin, Texas A&M University, and Rice University. With the close connection to Texas, Girault’s research, originally on the theory and discretization of Navier-Stokes equations, veered mostly to the theory and numerics of problems of complex fluids, problems of poroelasticity, and problems of nonlinear implicit models introduced by K. R. Rajagopal. She served as associate editor of the AMS journal *Mathematics of Computation* from 2006 to 2017. In her spare time, she enjoys cooking and hiking in the mountains.

—From an AWM–SIAM announcement

Lewis Awarded 2020 von Neumann Theory Prize



Adrian S. Lewis

Adrian S. Lewis of Cornell University has been awarded the 2020 John von Neumann Theory Prize of the Institute for Operations Research and the Management Sciences (INFORMS) “for his fundamental and sustained contributions to continuous optimization, operations research, and, more broadly, computational science.”

The prize citation reads: “His work has pushed the frontiers of nonlinear optimization and convex analysis and developed path-breaking theory that has led to much subsequent work. The clarity and elegance of his writing is well known and admired. Through scholarly papers, research monographs, and mentorship, he has influenced several generations of optimization researchers, as well as practitioners.

“Professor Lewis has published seminal work on a wide range of topics including eigenvalue optimization, quasi-Newton algorithms, gradient sampling methods and control, activity identification via partial smoothness, alternating projection methods, conditioning and error bounds, semi-algebraic variational analysis and the Kurdyka-Lojasiewicz inequality, and hyperbolic polynomials. His results on convex analysis over Hermitian matrices opened the door to the subdifferential analysis of such functions, as well as to a duality and sensitivity theory for optimization problems with such functions. Together with Burke and Overton, he produced a series of papers leading to a deep understanding of the variational behavior of spectral functions, including the spectral radius. His convergence

guarantees for alternating/cyclic projection methods, both for convex and nonconvex settings, are used to find a point at the intersection of finitely many sets, a prototypical problem in computational mathematics. A consistent theme in Professor Lewis's work is to bring variational analytic tools and computation closer together. For example, his recent paper, with Drusvyatskiy and Ioffe, proves that under a natural transversality condition, described in variational analytic terms, the method of alternating projections converges linearly locally. His more recent work has focused on understanding the impact of variational analytic notions of stability on linear/quadratic rates of convergence of Gauss–Newton type methods for minimizing compositions of convex functions and smooth maps. These results have implications for a number of fundamental problems including phase retrieval, matrix factorization, and robust principal component analysis."

Lewis received his PhD degree from the University of Cambridge. He held positions at the University of Waterloo (1989–2001) and Simon Fraser University (2001–2004) before joining the faculty at Cornell in 2004 as a professor in the School of Operations Research and Information Engineering. He served as the School's director from 2010 to 2013. He has also held visiting appointments at numerous universities internationally. He has authored nearly 100 refereed publications and a book, is coeditor of the journal *Mathematical Programming, Series A*, and has served on editorial boards of several other journals. His honors include the 1995 Aisenstadt Prize, the 2003 Lagrange Prize, a 2005 Outstanding Paper Prize from the Society for Industrial and Applied Mathematics (SIAM), and, with coauthors, the 2018 INFORMS Computing Society Prize. He was an invited section speaker at the 2014 International Congress of Mathematicians in Seoul and is a Fellow of SIAM. Lewis tells the *Notices*: "I'm always eager to share some of my favorite things...from Masaaki Suzuki's Bach cantatas to Wynton Marsalis playing 'Green Chimneys,' from skate skiing in the Gatineau hills to hiking in the Adirondacks, from Iberico de Bellota in Seville to pizza slices from the Forno Campo de' Fiori, from Kore-eda's *After Life* to...still chuckling and chuckling, with my daughter Nia, after some years, at Peter Dennis reading *Winnie the Pooh*."

—Elaine Kehoe, from an INFORMS announcement

Aldous Awarded Brouwer Medal



David Aldous

David Aldous of the University of California, Berkeley, has been awarded the 2021 Brouwer Medal of the Royal Dutch Mathematical Society and the Royal Netherlands Academy of Sciences. Aldous's research involves probability theory and its applications, particularly exchangeability, weak convergence, Markov chain mixing times, continuum random trees, stochastic coalescence,

and spatial random networks. A central theme in his work has been the study of large finite random structures, obtaining asymptotic behavior as the size tends to infinity via consideration of some suitable infinite random structure.

Aldous received his PhD from the University of Cambridge in 1977 under the direction of D. J. H. Garling. He joined the faculty at Berkeley in 1979 and retired in 2018. He continues to do research activities, particularly a project he calls "Probability and the Real World." He was awarded the Rollo Davidson Prize in 1980 and the Loève Prize in 1993. He was elected a Fellow of the Royal Society in 1994. From 2004 to 2010, Aldous was an Andrew Dickson White Professor-at-Large at Cornell University. He was an invited speaker at the International Congress of Mathematicians (ICM) in 1998 in Berlin and a plenary speaker at the ICM in 2010 in Hyderabad. He is also a Fellow of the American Academy of Arts and Sciences and a foreign associate of the National Academy of Sciences. In 2012, he was elected a Fellow of the AMS. Aldous tells the *Notices*: "I play volleyball and 4X computer games, read science fiction, participate in geopolitical forecasting tournaments, and drink wine...."

—Elaine Kehoe

Browning Awarded 2021 Balaguer Prize



Timothy Browning

Timothy Browning of the Institute of Science and Technology, Austria, has been awarded the 2021 Ferran Sunyer i Balaguer Prize for his monograph "Cubic Forms and the Circle Method," to appear in *Progress in Mathematics* (Birkhäuser). Browning works in number theory, particularly the interface of analytic number theory and Diophantine geometry. He

received his PhD from the University of Oxford in 2002 under the direction of Roger Heath-Brown. After postdoctoral work at Université Paris-Sud and the University of Oxford, he served as a lecturer and reader in pure mathematics at the University of Bristol (2005–2012), becoming a professor there in 2012. He served as the director of the Pure Institute at Bristol from 2016 to 2018. He joined IST Austria as a professor in 2018. His honors include the 2008 Whitehead Prize of the London Mathematical Society, the 2009 Balaguer Prize, and the 2010 Leverhulme Prize. He was a Simons Visiting Professor at the Mathematical Sciences Research Institute (MSRI) at Berkeley in 2017. He is editor in chief of the *Proceedings of the London Mathematical Society*. Browning tells the *Notices*: “I enjoy cycling in the Vienna woods, brewing beer, and exploring ruined castles with my family.”

—Elaine Kehoe

Huh Awarded Ho-Am Prize



June Huh

June Huh of Stanford University has been awarded the 2021 Samsung Ho-Am Prize in Physics and Mathematics. According to the prize citation, he is “an innovative young mathematician. Professor Huh used breakthrough methods from algebraic geometry to prove the long-standing unsolved mathematical problems of Read’s conjecture and the Rota–Heron–Welsh conjecture.

He has gained global recognition in the world of modern mathematics.”

Huh was born in Stanford, California, and earned his PhD in mathematics from the University of Michigan in 2014 under the direction of Mircea Mustață. He was a Clay Foundation Fellow from 2014 to 2019 and a Veblen Fellow from 2014 to 2017. He spent the academic years 2014–2017 at the Institute for Advanced Study (IAS) and Princeton University, then became visiting professor at the IAS (2017–2019). He was Fernholz Visiting Professor at Princeton University in 2019–2020. He was named professor at Stanford in 2020. He has been a visiting scholar at the Korea Institute for Advanced Study since 2015. His honors include the Blavatnik Regional Award for Young Scientists of the New York Academy of Sciences (2017) and the New Horizons in Mathematics Prize of the Breakthrough Prize Foundation in 2019. He has also given a number of lectures and invited talks, including at the International Congress of Mathematicians in Rio de Janeiro in 2018, the Simons Lectures in Mathematics (2019), and the Abraham Robinson Memorial Lectures (2020).

The Samsung Ho-Am Prizes are presented to individuals of Korean heritage who have contributed to academics, the arts and sciences, and social development or who have furthered the welfare of humanity through distinguished accomplishments in their respective fields.

—From a Ho-Am Foundation announcement

Gracia-Saz Receives CMS Teaching Award



Alfonso Gracia-Saz

Alfonso Gracia-Saz of the University of Toronto has been named the recipient of the 2021 Excellence in Teaching Award of the Canadian Mathematical Society (CMS). The prize citation reads in part: “It is said that when Dr. Gracia-Saz teaches, he reinvents teaching. His work with the University of Toronto’s legendary MAT137 (Calculus with Proof) is an excellent example of his dynamic

teaching style; his reorganization, his attention to detail, his famous problem sets, and his inspiring lectures and videos have given this challenging course a new level of energy—particularly significant in this recent time of pandemic challenge. A second example is found in his design of the instructor training program at the University of Toronto, a program that has now been extended to all teaching assistants in the Mathematics Department.”

Gracia-Saz received his PhD in mathematics from the University of California, Berkeley, in 2006 under the supervision of Alan Weinstein. He held postdoctoral positions at Keio University in Japan and the University of Toronto before taking faculty positions at the University of Victoria and at Toronto. His research interests are centered in active learning, inquiry-based learning, Poisson geometry, and Lie algebroids. He has served as an instructor and academic coordinator of the Canada/USA Mathcamp. His calculus YouTube channel, with 200 videos, has more than 10,000 subscribers and well over 3 million views. He is active in mathematics outreach through competitions, math camps, science fairs, and undergraduate research. He has worked in a prison university project (currently Mount Tamalpais College) and has written a mathematical play. He and his partner, Nick, enjoy contra dancing, cooking, and complex board games.

—From a CMS announcement

Prizes of the Mathematical Society of Japan

The Mathematical Society of Japan (MSJ) has awarded several prizes for 2021.

Masaki Tsukamoto of Kyushu University has been awarded the 2021 MSJ Spring Prize “for his outstanding contributions to studies on mean dimension in dynamical systems.” The Spring Prize and the Autumn Prize are the most prestigious prizes awarded by the MSJ to its members. The Spring Prize is awarded to mathematicians under the age of forty who have obtained outstanding mathematical results.

The Algebra Prizes were awarded to **Masanori Asakura** of Hokkaido University for work on regulators of algebraic K -groups and algebraic cycles and to **Kazuhiko Yamaki** of Kyoto University for contributions to the geometric Bogomolov conjecture.

The Outstanding Paper Prizes are given for papers published in the *Journal of the Mathematical Society of Japan*. The 2021 prizes were awarded to the following: **Martin Dickson** (Kings’ College, London), **Ameya Pitale** (University of Oklahoma), **Abhishek Saha** (Queen Mary University of London), and **Ralf Schmidt** (University of North Texas) for their paper, “Explicit Refinements of Böcherer’s Conjecture for Siegel Modular Forms of Squarefree Level,” 72 (2020), no. 1; to **Masami Ohta** (Tokai University) for “ μ -Type Subgroups of $J_1(N)$ and Application to Cyclotomic Fields,” 72 (2020), no. 2; and to **Yuzuru Inahama** and **Setsuo Taniguchi** (Kyushu University) for “Heat Trace Asymptotics on Equiregular Sub-Riemannian Manifolds,” 72 (2020), no. 4.

—From MSJ announcements

2021 Simons Fellows in Mathematics

The Simons Foundation Mathematics and Physical Sciences (MPS) division supports research in mathematics, theoretical physics, and theoretical computer science. The MPS division provides funding for individuals, institutions, and science infrastructure. The Fellows Program provides funds to faculty for up to a semester-long research leave from classroom teaching and administrative obligations. The mathematical scientists who have been awarded 2021 Simons Fellowships are:

- **Mohammed Abouzaid**, Columbia University
- **Dan Abramovich**, Brown University
- **Louigi Addario-Berry**, McGill University
- **Radu Balan**, University of Maryland, College Park

- **Sandra Cerrai**, University of Maryland, College Park
- **Ivan Corwin**, Columbia University
- **Carina Curto**, Pennsylvania State University
- **Charles Doering**, University of Michigan
- **Hongjie Dong**, Brown University
- **Alexander Elgart**, Virginia Polytechnic Institute and State University
- **Solomon Friedberg**, Boston College
- **Loukas Grafakos**, University of Missouri
- **Alan Hammond**, University of California, Berkeley
- **Kate Juschenko**, University of Texas at Austin
- **Joel Kamnitzer**, University of Toronto
- **Konstantin Khanin**, University of Toronto
- **Chandrashekhara Khare**, University of California, Los Angeles
- **Mikhail Khovanov**, Columbia University
- **Bryna Kra**, Northwestern University
- **George Lusztig**, Massachusetts Institute of Technology
- **Russell Lyons**, Indiana University
- **Konstantin Mischaikow**, Rutgers, The State University of New Jersey
- **Jennifer Morse**, University of Virginia
- **Grigoris Paouris**, Northwestern University
- **Benoit Pausader**, Brown University
- **Kasra Rafi**, University of Toronto
- **Firas Rassoul-Agha**, University of Utah
- **Yiannis Sakellaridis**, Johns Hopkins University
- **Laura Schaposnik**, University of Illinois at Chicago
- **Christian Schnell**, Stony Brook University
- **Zhongwei Shen**, University of Kentucky
- **Katherine Stange**, University of Colorado, Boulder
- **Hung Tran**, University of Wisconsin–Madison
- **Gunther Uhlmann**, University of Washington
- **Jan Wehr**, University of Arizona
- **Jonathan Wise**, University of Colorado, Boulder
- **Helen Wong**, Claremont McKenna College
- **Jared Wunsch**, Northwestern University, Chicago Campus
- **Michael Yampolsky**, University of Toronto
- **Andrej Zlatoš**, University of California, San Diego

—From a Simons Foundation announcement

2020 Krill Prizes Awarded



Meirav Zehavi

The Wolf Foundation has awarded the 2020 Krill Prizes for Excellence in Scientific Research.

Meirav Zehavi of Ben Gurion University was honored for her work in parameterized analysis, algorithms, complexity, and kernelization. Her work is described as follows: “Design and analysis of algorithms lie at the heart of computer science.

Unfortunately, today we know of numerous problems that are NP-hard, believed not to admit worst-case efficient (polynomial-time) exact algorithms. However, if we take a deeper look, we will observe that the nutshell of hardness often lies in either a particular property of the instance, or even just a small part of it. Parameterized analysis leads to both deeper understanding of intractability results and practical solutions for many NP-hard problems. Informally speaking, parameterized analysis is a deep mathematical paradigm to answer the following fundamental question: What makes an NP-hard problem hard? Specifically, how do different parameters (being formal quantifications of structure) of the problem relate to its inherent difficulty? Can we exploit these relations algorithmically, and to which extent?” Zehavi received her PhD in computer science from Technion-Israel Institute of Technology in 2015 under the direction of Ron Pinter and Hadas Shachnai. She has been a postdoctoral researcher at Tel Aviv University, the Simons Institute for the Theory of Computing, and the University of Bergen. She joined the faculty at Ben-Gurion University in 2017 and is currently associate professor. She was awarded the Alon Fellowship for Outstanding New Faculty in Israel for 2018 through 2021. She tells the *Notices*: “I love animals, and currently have a parrot. In the past, I had a large number of other pets. I enjoy playing board games and traveling.”

Yuval Filmus of Technion-Israel Institute of Technology was recognized for his work in Boolean analysis. According to the prize citation, his research “is at the intersection of theoretical computer science, specifically computational complexity theory, and mathematics. Computational complexity theory aims to show that some problems are hard to compute. Boolean function analysis is a key tool underlying much recent work in computational complexity theory. It is a discrete analog of classical Fourier analysis.... The work of Filmus has focused on extending the reach of Boolean function analysis beyond its classical domain of applicability.”

Filmus received his PhD from the University of Toronto under the direction of Toni Pitassi. After postdoctoral work at the Institute for Advanced Study, he joined the faculty at

Technion in 2015. He is a recipient of the Alon Fellowship and is currently assistant professor.

The Krill Prizes are awarded by the Wolf Foundation to faculty members at Israeli universities. Selection is made on the basis of the candidate’s excellence and the importance of his or her field of research.

—From Wolf Foundation announcements

2020 Sacks Prize Awarded

James Walsh of the University of California, Berkeley, has been awarded the 2020 Gerald Sacks Prize of the Association for Symbolic Logic for outstanding doctoral dissertation in mathematical logic. Walsh received his PhD in 2020 from the University of California, Berkeley, under the supervision of Paolo Mancosu and Antonio Montalbán. His thesis, “Reflection Principles and Ordinal Analysis,” presents significant new results on the philosophical and conceptual foundations of proof theory. It identifies natural classes of theories that rule out pathological behaviors that can otherwise arise in ordinal analysis, and it makes important progress towards explaining why proof-theoretic results tend to be robust with respect to the kinds of theories that occur naturally in mathematics.

—From a Sacks Prize announcement

Fernandez Awarded Guggenheim Fellowship

The John Simon Guggenheim Foundation has awarded its Fellowships for 2021. **Oscar E. Fernandez** of Wellesley College was awarded a Fellowship in Applied Mathematics. Fernandez received his PhD from the University of Michigan, Ann Arbor. His research is in geometric mechanics, which applies advanced mathematical tools and techniques to study the dynamics of various types of systems (e.g., mechanical systems). He applies these tools and techniques “to shed new light on problems in mathematical demography, including how life span inequality changes across time and species.” Fernandez is a cofounder of the Wellesley Emerging Scholars Initiative (WESI), which provides underrepresented students of color studying mathematics with a learning community centered on excellence in mathematics, and he has written books relating calculus to everyday activities and personal life.

—Elaine Kehoe

Regeneron Science Talent Search

The Regeneron Science Talent Search was held virtually in March 2021. The following young scientists, whose work involves the mathematical sciences, are among the top winners in the 2021 Regeneron Science Talent Search.

Yunseo Choi, eighteen, of Phillips Exeter Academy in Exeter, New Hampshire, was awarded first place for her project, “On Two-Sided Matching in Infinite Markets,” in which she studied matching algorithms that work for a finite number of couples and determined which important properties would still work for an infinite number of pairs. Matching theory has numerous real-life applications, including matching organ donors to recipients, assigning medical school applicants to rotations, and pairing potential couples in dating apps. Choi received a cash award of US\$250,000.

Gopal Goel, seventeen, of Portland, Oregon, received the fourth-place award for his research project, “Discrete Derivative Asymptotics of the β -Hermite Eigenvalues,” which made connections between two subjects regarding randomness and probability. Goel believes his work can be useful to researchers in the fields of nuclear physics, quantum field theory, and meteorology and hopes it will aid in the search for the true nature of quantum gravity, more commonly known as “the theory of everything.” Goel received a cash award of US\$100,000.

Sam Christian, seventeen, of the Liberal Arts and Science Academy in Austin, Texas, took tenth place for research looking at computationally modeled data from numerous observatories and NASA’s TESS telescope to identify and observe movements of planets in sixty-nine wide-binary star systems, which are twin-star systems spaced up to a light year apart. He showed that the orbits of these exoplanets align to a great extent with the orbit of their binary system. Christian received a cash award of US\$40,000.

The Regeneron Science Talent Search is the United States’ oldest and most prestigious science and mathematics competition for high school seniors. It is administered by the Society for Science and Regeneron Pharmaceuticals, Inc.

—From a Society of Science announcement

2021 SIAM Fellows Elected

The Society for Industrial and Applied Mathematics (SIAM) has elected its class of fellows for 2021. Their names, institutions, and the work for which they were recognized follow.

- **Alejandro Aceves**, Southern Methodist University, for pioneering contributions to the field of nonlinear waves and its applications to a variety of areas, most notably nonlinear optics.
- **James V. Burke**, University of Washington, for pioneering contributions to continuous optimization and variational analysis.
- **Robert Calderbank**, Duke University, for deep contributions to information theory.
- **Xiaojun Chen**, Hong Kong Polytechnic University, for contributions to optimization, stochastic variational inequalities, and nonsmooth analysis.
- **Edmond Chow**, Georgia Institute of Technology, for contributions to computational science and engineering in the areas of numerical linear algebra and high-performance computing.
- **Robert D. Falgout**, Lawrence Livermore National Laboratory, for contributions to the theory, practice, and large-scale applications of multilevel solvers and for widely used parallel software.
- **Martín Farach-Colton**, Rutgers University, for contributions to the design and analysis of algorithms and their use in storage systems and computational biology.
- **Shmuel Friedland**, University of Illinois at Chicago, for deep and varied contributions to mathematics, especially linear algebra, matrix theory, and matrix computations.
- **Gary Froyland**, University of New South Wales, for contributions to dynamical systems and discrete optimization and the advancement of transfer operator methods.
- **Tryphon T. Georgiou**, University of California, Irvine, for foundational contributions to the theory of robust control and to spectral analysis of time series.
- **Jean-Luc Guermond**, Texas A&M University, for innovative contributions to computational fluid mechanics and fundamental contributions to the development and teaching of the finite element methods.
- **Trachette L. Jackson**, University of Michigan, for innovative contributions to mathematical modeling in cancer biology and for the advancement of underrepresented minorities in science.
- **Jeremy V. Kepner**, MIT Lincoln Laboratory, for contributions to interactive parallel computing, matrix-based graph algorithms, green supercomputing, and big data.
- **Denise Kirschner**, University of Michigan, for contributions to modeling pathogen-host interactions and host immune response in infectious diseases and training in mathematical biology/immunology.

- **Rachel Levy**, Mathematical Association of America, for leadership in applied mathematics education, especially in mathematical modeling, across the entire educational spectrum.
- **Per-Gunnar Martinsson**, University of Texas at Austin, for contributions to the numerical solution of partial differential equations and to the development of randomized algorithms for matrix computations.
- **Anna L. Mazzucato**, Pennsylvania State University, for discerning analysis of fundamental problems in partial differential equations and mathematical fluid mechanics including boundary layers, transport, and mixing.
- **Kirsten A. Morris**, University of Waterloo, for contributions to modeling, approximation, and control design for distributed parameter systems.
- **Habib N. Najm**, Sandia National Laboratories, for pioneering contributions to uncertainty quantification and the use of Bayesian methods in physical modeling, with applications to combustion and far beyond.
- **Qing Nie**, University of California, Irvine, for research and mentoring contributions spanning applied and computational mathematics and developmental cell biology.
- **Beatrice M. Riviere**, Rice University, for contributions in numerical analysis, scientific computing, and modeling of porous media.
- **Jonathan E. Rubin**, University of Pittsburgh, for contributions to mathematical neuroscience, mathematical biology, and dynamical systems theory.
- **Jennifer Scott**, University of Reading and Science and Technology Facilities Council, for contributions to sparse matrix algorithms and software.
- **Eitan Tadmor**, University of Maryland College Park, for original, broad, and fundamental contributions to applied and computational mathematics, including conservation laws, kinetics, image processing, and social dynamics.
- **Shang-Hua Teng**, University of Southern California, for contributions to scalable algorithm design, mesh generation, and algorithmic game theory, and for pioneering smoothed analysis of linear programming.
- **Andreas Wächter**, Northwestern University, for fundamental contributions to nonlinear optimization, including algorithm design, theory, and software.
- **Rebecca M. Willett**, University of Chicago, for contributions to mathematical foundations of machine learning, large-scale data science, and computational imaging.

- **Jack Xin**, University of California, Irvine, for pioneering work on traveling waves in periodic and random media and applications ranging from signal processing to finance.

—SIAM announcement

NAE Elections

The National Academy of Engineering (NAE) has elected its new members and international members for 2021. Following are the newly elected members whose work involves the mathematical sciences:

- **Glaucio H. Paulino**, Georgia Institute of Technology, for contributions to topology optimization and its applications to medicine and engineering.
- **Donald R. Wilton**, University of Houston, for contributions to computational electromagnetics of highly complex structures.

Elected as international members were:

- **Sebastian Ceria**, Qontigo, New York City, for application of optimization tools to advance integer programming and financial engineering.
- **Mario Veiga Ferraz Pereira**, PSR Energy Consulting and Analytics, Rio de Janeiro, Brazil, for contributions to methodology and implementation of multistage stochastic optimization in hydroelectric scheduling, energy planning, and policy.

—From an NAE announcement

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