

Mathematics People

Wood Receives NSF Waterman Award



Melanie Matchett Wood

Melanie Matchett Wood of Harvard University has been named a co-recipient of the 2021 National Science Foundation (NSF) Alan T. Waterman Award for “fundamental contributions in number theory, algebraic geometry, topology, and probability.” She is the first woman mathematician to receive the honor.

The NSF statement reads in part: “Throughout her scientific career, Wood has worked on some of the most difficult problems in mathematics and has developed methods that combine ideas from across mathematics. Wood studies the statistical behavior of how factorization works in different systems of numbers, aiming to answer questions posed 200 years ago by Gauss.” Her work is aimed at understanding the distribution of number fields and their fundamental structures, including class groups, p -class tower groups, and the Galois groups of their maximal unramified extensions. It involves such questions as counting number fields, finding the average number of unramified G -extensions that they have, bounding the sizes of class groups, and function field analogs of all of these questions (which then leads to questions in topology about certain moduli spaces of curves). To understand the distribution of class groups and Galois groups of unramified extensions, she studies random abelian and non-abelian groups to construct the random groups that are relevant for number theory and understand their properties. She also works on developing tools in probability theory to study randomly arising finite groups, such as the Jacobians of random graphs and cokernels of random matrices.

Wood received her PhD from Princeton University in 2009, supervised by Manjul Bhargava. She has held positions at Stanford University (2009–2011), the University of Wisconsin, Madison (2011–2019), and the University of California, Berkeley (2019–present). She was named Minerva Distinguished Visitor at Princeton University in 2018. She has been an AIM Five-Year Fellow (2009–2017) and

currently holds a Packard Fellowship and an NSF CAREER grant. In high school, Wood won silver medals at the 1998 and 1999 International Mathematical Olympiad as the first US female in the competition. In 2001, she was awarded the Elizabeth Lowell Putnam Prize in the Putnam Mathematical Competition; in 2002 she became a Putnam Fellow. Her honors include the Alice T. Schafer Prize of the Association for Women in Mathematics (2002), the AMS–MAA–SIAM Morgan Prize (2003), a Clay Mathematics Institute Liftoff Fellowship (2009), and the AWM–Microsoft Research Prize in Algebra and Number Theory (2018). She was named an Inaugural Fellow of the AMS in 2012.

The Waterman Award annually recognizes an outstanding young researcher in any field of science or engineering supported by NSF. Researchers forty years of age or younger, or up to ten years post-PhD, are eligible. Awardees receive US\$1 million distributed over five years.

—Elaine Kehoe, from NSF and Harvard University announcements

Akhtari Awarded Michler Memorial Prize



Shabnam Akhtari

Shabnam Akhtari of the University of Oregon has been awarded the 2021–2022 Ruth I. Michler Memorial Prize of the Association for Women in Mathematics (AWM) and Cornell University. The prize citation states: “Shabnam Akhtari was selected to receive the Michler Prize to pursue her proposed research on classical Diophantine equations, in particular to study index form equations and

their applications to understanding the structure of rings in algebraic number fields. Awarding this opportunity to Akhtari adds to the distinguished history of the Michler Prize. She is a stellar researcher who will have lasting impact in number theory and in mathematics.”

Akhtari earned her PhD at the University of British Columbia, advised by Michael Bennett. She has been a post-doctoral fellow at Queen’s University, Kingston, Ontario; at

the Max Planck Institute for Mathematics, Bonn; and at the Centre de Recherches Mathématiques, Montreal. In 2012 she joined the faculty in the Department of Mathematics at the University of Oregon, where she is currently associate professor. She has been awarded two single-researcher National Science Foundation grants, as well as two Simons Foundation fellowships, and has held a number of visiting positions.

—From an AWM announcement

Lawrence and Rivera Awarded Karen EDGE Fellowships



Manuel Rivera

Emille Davie Lawrence of the University of San Francisco and **Manuel Rivera** of Purdue University have been selected the recipients of 2021 Karen EDGE Fellowships. The Fellowship Program was established with a generous gift from Karen Uhlenbeck on the occasion of her 2019 Abel Prize.

Lawrence received her PhD in mathematics from the University of Georgia in 2007, under the direction of Will Kazez and Clint McCrory. She was a postdoctoral fellow at the University of California, Santa Barbara, and assistant professor at California State Polytechnic University. In 2011 she joined the faculty of the University of San Francisco, where she is currently a term associate professor and department chair. Her research is in spatial graph theory, a branch of geometric topology in the intersection of knot theory and graph theory. She is also an advocate for broadening participation in the mathematical sciences through outreach and mentoring. She is editor-in-chief of the AMS blog “Math Mamas” and associate editor of the *College Mathematics Journal* and has been active in service to the Association for Women in Mathematics (AWM) and the Mathematical Association of America (MAA), among other organizations.

Rivera received his PhD from the City University of New York in 2015 under the direction of Dennis Sullivan. He was a postdoctoral researcher at the Institut de Mathématiques de Jussieu Paris-Rive Gauche (2015–2016) and a joint research assistant professor at the University of Miami and CINVESTAV in Mexico City (2016–2019) and is currently assistant professor at Purdue University. The overarching goal of Rivera’s research is to understand the algebraic nature of geometric space using the ideas and tools of algebraic topology. He tells the *Notices* that, when he is not doing

mathematics, he is probably playing with his two-year-old son Bruno and dog Milo, a Puerto Rican stray dog rescued during the aftermath of Hurricane Maria in 2017.

The Karen EDGE Fellowships are designed to support and enhance the research programs and collaborations of midcareer mathematicians who are members of an underrepresented minority group. The 2021 Fellows were selected on the basis of their excellent research programs and their plans to use the funds for enhancing those programs through collaboration and travel.

—From an EDGE Foundation announcement

Manolescu and Remenik Awarded Davidson Prize



Ioan Manolescu

Ioan Manolescu of the Université de Fribourg and **Daniel Remenik** of Universidad de Chile have been awarded the 2021 Rollo Davidson Prize. Manolescu was recognized for his “outstanding work on critical physical systems in two dimensions, particularly the random cluster and Potts models.” He received his PhD in 2012 from the University of Cambridge under the supervision of Geoffrey Grimmett. From 2012 to 2015 he held a postdoctoral position at the University of Geneva, working in the group of Stanislav Smirnov and Hugo Duminil-Copin. He joined the Université de Fribourg in 2015, where he is a professor. In his free time he enjoys hiking, skiing, and playing rugby.



Daniel Remenik

Remenik was honored for his “transformative contributions to the understanding of the KPZ fixed point.” He received his PhD from Cornell University in 2009. His major research interest is probability theory, particularly problems related to the KPZ universality class. He was awarded the 2021 MCA Prize of the Mathematical Council of the Americas for work on this topic.

—From a Davidson Prize announcement

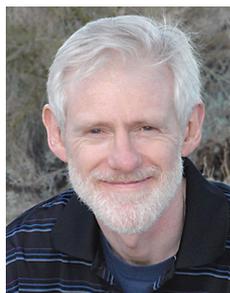
Polyakov Awarded Max Planck Medal

Alexander M. Polyakov of Princeton University has been awarded the Max Planck Medal for his work in quantum field theory and statistical mechanics, especially on monopole and instanton solutions in Yang–Mills theory, on the conformal bootstrap, and on the duality of strings and gauge fields.

Polyakov received his doctorate in 1969 from the Landau Institute of Theoretical Physics. He was head of the Department of Quantum Field Theory at Landau, then moved to Princeton University in 1990. Since 1999 he has been Joseph Henry Professor of Physics at Princeton. His honors include the Dirac Medal of the ICTP (1986), the Dannie Heineman Prize for Mathematical Physics (1986), the Lorentz Medal (1994), the Harvey Prize (2010), the Lars Onsager Prize (2011), and the Fundamental Physics Prize (2013). He is a member of the National Academy of Sciences (NAS), the Soviet Academy of Sciences, and the French Academy of Sciences.

—*Elaine Kehoe*

Dunham Awarded PIMS Education Prize



Bruce Dunham

Bruce Dunham of the University of British Columbia is the recipient of the 2021 Education Award of the Pacific Institute of Mathematical Sciences (PIMS). According to the prize citation, “Dr. Dunham is an internationally respected expert in statistics education, and has contributed to education in the mathematical sciences by developing and providing resources for evidence-based teaching.

He has also provided training and expert advice on statistics teaching and curriculum. He has served in a range of leadership roles at UBC and at the provincial and national level.”

Dunham has served on the British Columbia Committee on the Undergraduate Program in Mathematics and been the chair of its statistics subcommittee since 2006. He has played a major role in the new BC Statistics 12 high school course, including offering five training workshops for teachers. At the national level, he has served in various roles in the Statistical Society of Canada. His curriculum work in the school system and his development of free software for the community have had a direct public impact.

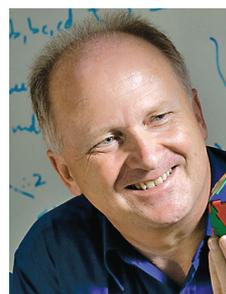
Dunham received his PhD in probability theory from the University of London. He held positions at the University of Nottingham and the University of Derby before joining the faculty at British Columbia. He tells the *Notices* that, outside of his work, he enjoys running, is an avid fan of soccer (both playing and watching), and plays ping-pong and pickleball with his family. His more leisurely pursuits include playing board games and enjoying movies, music, and theatre.

The PIMS Education Prize is awarded to a member of the PIMS community who has made a significant contribution to education in the mathematical sciences.

—*From a PIMS announcement*

ICA Medals Awarded

The Institute of Combinatorics and Its Applications (ICA) has awarded several medals for the year 2020.



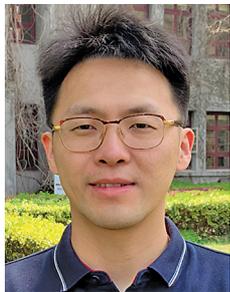
Marston Conder

Marston Conder of the University of Auckland was awarded the Euler Medal, which recognizes distinguished lifetime career contributions to combinatorial research by Fellows of the ICA, including those who remain active in research. According to the prize citation, Conder “has made many distinguished contributions to combinatorics over the last forty years. He has a worldwide reputation

for developing and applying techniques from combinatorial and computational group theory to answer questions and solve problems in a range of areas of mathematics with a particular focus on discrete objects (such as graphs, maps, polytopes, and Riemann surfaces) with maximum possible symmetry subject to given constraints. He has made many groundbreaking discoveries and answered many open questions in a wide range of topics, including graph symmetries, graph embeddings, regular and chiral maps, regular and chiral polytopes, as well as edge-partitions of graphs, higher-dimensional expander graphs, and binary Gray codes. He is renowned for the way in which he freely shares his knowledge and the results of his research with others, and in particular, for his repositories of discrete objects of particular kinds, which he found using a combination of theory and computation. These are widely used, and have been helpful not only in answering new research questions but also in leading to new discoveries.”

Conder was also the recipient of the 2018 Jones Medal of the Royal Society of New Zealand for his “internationally renowned research on symmetry and chirality in discrete

structures, and his exemplary leadership and service in the New Zealand mathematical sciences community.”



Jie Ma

Jie Ma of the University of Science and Technology of China (USTC) received the ICA Hall Medal, which recognizes extensive quality research with substantial international impact by Fellows or Associate Fellows of the ICA in midcareer. He was honored for his “outstanding contributions in the fields of extremal and probabilistic combinatorics and structural graph theory. He obtained several important results in the study of hypergraph Turan numbers and proved several conjectures on the distribution of cycle lengths in graphs. He solved, or asymptotically solved, several open problems by Bollobás and Scott on judicial partitions of graphs and hypergraphs,” and he has made “breakthroughs on several other difficult, long-standing problems of structural and extremal flavor.” Ma earned his PhD from the Georgia Institute of Technology in 2011 under the direction of Xingxing Yu. He is an associate editor of the *SIAM Journal on Discrete Mathematics*. He is a frequent speaker at national and international conferences, and he sometimes teaches high school students who are especially talented in mathematics. Ma currently lives in Hefei, China, with his three-year-old daughter Lexi Ma and his wife Gigi. He is interested in history, likes traveling, and enjoys food from all over the world.

Chong Shangguan of Shandong University was honored with the Kirkman Medal, which recognizes excellent research by Fellows or Associate Fellows of the ICA early in their research careers, as evidenced by an excellent body of published research. According to the prize citation, he “has made deep contributions to extremal combinatorics and combinatorial coding theory. His notable research achievements include an original and elegant proof regarding the combinatorial list-decodability of Reed–Solomon codes, significant progress on two well-known and difficult conjectures on the Turan number of sparse hypergraphs, and the resolution of several conjectures and open problems on perfect hash and separating hash families. A striking feature of his research is the broad range from theory to applications, where tools from extremal combinatorics, additive combinatorics, probabilistic combinatorics, and the polynomial method are involved.” He received his PhD from Zhejiang University in 2017, advised by Gennian Ge, and held a postdoctoral research position at Tel Aviv University before joining the faculty at Shandong University. His research has produced sixteen published papers in top-ranked journals or conference proceedings in combinatorics, coding theory, and theoretical computer science. The citation states: “A striking feature of his research is the broad range from theory to applications, where tools

from extremal combinatorics, additive combinatorics, probabilistic combinatorics, and the polynomial method are involved.”

—From ICA announcements

AIM Alexanderson Award Presented

Laura DeMarco of Harvard University, **Holly Krieger** of the University of Cambridge, and **Hexi Ye** of Zhejiang University have been named the recipients of the 2020 Alexanderson Award of the American Institute of Mathematics for their joint paper, “Uniform Manin–Mumford for a family of genus 2 curves,” *Annals of Mathematics* **191** (2020), no. 3. DeMarco received her PhD from Harvard in 2002 and has taught at the University of Chicago, the University of Illinois at Chicago, and Northwestern University. Krieger received her PhD from the University of Illinois at Chicago in 2013. She held a National Science Foundation Postdoctoral Fellowship at the Massachusetts Institute of Technology from 2013 to 2016. Ye received his PhD from the University of Illinois at Chicago in 2013 and held postdoctoral fellowships at the University of Toronto (2013–2014) and the University of British Columbia (2014–2016). He has been at Zhejiang University since 2016. The Alexanderson Award recognizes outstanding scholarly articles arising from AIM research activities that have been published within the past few years.

—From an AIM announcement

2021 Traub Prize Announced

Vladimir N. Temlyakov of the University of South Carolina, **Mario Ullrich** of Johannes Kepler University, and **Tino Ullrich** of Chemnitz University of Technology have been awarded the Joseph F. Traub Prize in Information-Based Complexity for 2021. They will split a cash award of US\$3,000. The prize is awarded annually for outstanding achievement in information-based complexity. It can be awarded for work done within a single year, a number of years, or over a lifetime.

—Traub Prize Committee announcement

Darbinyan Awarded Artin Prize

Arman Darbinyan of Texas A&M University has been awarded the 2021 Emil Artin Junior Prize in Mathematics. Darbinyan was chosen for his paper “Groups with decidable word problem that do not embed in groups with decidable conjugacy problem,” *Inventiones Mathematicae* 224 (2021). Established in 2001, the Emil Artin Junior Prize in Mathematics is awarded under the auspices of the Armenian Mathematical Union, carries a cash award of US\$1,400, and is presented usually every year to a student or former student of an Armenian educational institution under the age of thirty-five for outstanding contributions to algebra, geometry, topology, and number theory—the fields in which Emil Artin made major contributions. The prize committee consisted of A. Basmajian, Y. Movsisyan, and V. Pambuccian.

—Victor Pambuccian

USA Mathematical Olympiad

The 2021 USA Mathematical Olympiad was held April 13 and 14, 2021. The students who participated in the Olympiad were selected on the basis of their performances on the American High School and American Invitational Mathematics Examinations. The names and schools of the winners, in alphabetical order, follow.

- **Quanlin Chen**, Princeton International School of Math/Science, New Jersey
- **Xinyang Chen**, Glenda Dawson High School, Texas
- **Kevin Cong**, Phillips Exeter Academy, New Hampshire
- **Gopal Goel**, Krishna Home School, Oregon
- **Daniel Hong**, Skyline High School, Washington
- **Maxim Li**, Michigan State University, Michigan
- **Luke Robitaille**, Robitaille Home School, Texas
- **Eric Shen**, University of Toronto Schools, Ontario
- **Noah Walsh**, Walsh Academy, Oregon
- **William Wang**, West Windsor-Plainsboro High School North, New Jersey
- **Zifan Wang**, Princeton International School of Math/Science, New Jersey
- **Jaedon Whyte**, Archimedean Upper Conservatory, Florida
- **Daniel Yuan**, Montgomery Blair High School, Maryland

—Mathematical Association of America announcement

Churchill Scholars Announced

The Winston Churchill Foundation of the United States has announced the awarding of seventeen Churchill Scholarships for 2021–2022. **Isaac Martin** of the University of Utah was awarded a scholarship in pure mathematics. The scholarship provides for one year of master’s study at Churchill College, University of Cambridge.

—From a Churchill Foundation announcement

National Academy of Sciences Election

The National Academy of Sciences (NAS) has elected 120 new members for 2021. Following are the names and institutions of the mathematical scientists who are among the new members.

- **Joan S. Birman**, Barnard College
- **Peter Constantin**, Princeton University
- **Daniel Z. Freedman**, Massachusetts Institute of Technology; Institute for Theoretical Physics, Stanford University
- **Larry Guth**, Massachusetts Institute of Technology
- **Alexei Y. Kitaev**, California Institute of Technology
- **Randall J. LeVeque**, University of Washington
- **Linda Petzold**, University of California, Santa Barbara
- **Gigliola Staffilani**, Massachusetts Institute of Technology

Elected as international members were:

- **Jean-Michel Bismut**, Université Paris-Sud, France
- **Gilles Brassard**, Université de Montréal
- **Michael E. Cates**, University of Cambridge, United Kingdom

—From an NAS announcement

Fellows of the Royal Society

The Royal Society of London has announced the names of its newly elected Fellows for 2021. The new Fellows whose work involves the mathematical sciences are:

- **Jeremy Quastel**, University of Toronto
- **Richard Samworth**, University of Cambridge
- **Benjamin Simons**, University of Cambridge
- **Endre Süli**, University of Oxford
- **Karen Vogtmann**, University of Warwick; Cornell University

Elected as foreign members were:

- **Michael Jordan**, University of California, Berkeley
- **Claire Voisin**, CNRS

—From a Royal Society announcement

MathWorks Math Modeling (M3) Challenge

The 2021 MathWorks Math Modeling (M3) Challenge was held virtually in April 2021. This year’s problem for the teams was “Defeating the Digital Divide: Internet Costs, Needs, and Optimal Planning.” The teams of high school students were asked to use math modeling to provide solutions to combat the “digital divide” (the gap between those who benefit from adequate access to the Internet and those who do not).

The Challenge Champion team prize of US\$22,500 in scholarship money was awarded to a team from Livingston High School in Livingston, New Jersey. The team members were **Aditya Desai**, **Sidhant Srivastava**, **Leo Stepanewk**, **Edward Wang**, and **Charles Yu**. Their coach was Cheryl Coursen.

The Challenge Runner Up team prize of US\$17,000 went to a team from High Technology High School in Lincroft, New Jersey. The team members were **Adithya Balachandran**, **Lasya Balachandran**, **David Chang**, **Alexander Postovskiy**, and **Hazem Zaky**. They were coached by Raymond Eng.

The Third Place team prize of US\$12,000 was awarded to a team from Johns Creek High School, Johns Creek,

Georgia. The team members were **Jason Bao**, **Aditya Bora**, **Mehul Dhoot**, **Joseph Suharno**, and **Austin Tsang**. Their coach was Julie Meert.

Finalist team prizes of US\$6,500 were awarded to three teams. Two teams from Adlai E. Stevenson High School, Lincolnshire, Illinois, were honored. The first team consisted of **Spandan Goel**, **Greycen Ren**, **Andrew Liu**, **Gabriel Visotsky**, and **Joy Qu**; their coach was Paul Kim. The second team from Stevenson High School, also coached by Kim, consisted of **Emily Hu**, **James Kim**, **Brandon Lu**, **Sai Merneedi**, and **Praneet Rathi**. The third Finalist team was from Julia R. Masterman Middle High School, Philadelphia, Pennsylvania; the team members were **Tobias Beidler-Shenk**, **Tanay Bennur**, **Hayden Gold**, **Owen Moss**, and **Ethan Soloway**, and their coach was Kathryn Smith.

The M3 Challenge invites teams of high school juniors and seniors to solve an open-ended, realistic, challenging modeling problem focused on real-world issues. The top five teams receive awards ranging from US\$6,500 to US\$22,500 in scholarship money. The competition is sponsored by MathWorks, a developer of computing software for engineers and scientists, and is organized by the Society for Industrial and Applied Mathematics (SIAM).

—From a MathWorks/SIAM announcement

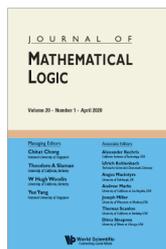
Credits

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