

Mathematics People

Wiles Awarded Copley Medal



Sir Andrew Wiles

SIR ANDREW WILES of the University of Oxford has been awarded the Copley Medal of the Royal Society of London for his breakthrough proof of Fermat's Last Theorem. In his work, he combined three fields of mathematics: modular forms, elliptic curves, and Galois representations. Wiles earned his PhD from Clare College, University of Cambridge, in 1980. He was affiliated with the Institute for Advanced

Study and Princeton University before joining the faculty at Oxford. Among Wiles's many honors have been the Rolf Schock Prize (1995), the Fermat Prize (1995), the Ostrowski Prize (1996), the Royal Medal of the Royal Society (1996), the Cole Prize (1997), the Wolf Prize (1995–1996), the King Faisal International Prize (1998), the Clay Research Award (1999), the Order of the British Empire (2000), the Shaw Prize (2005), and the 2016 Abel Prize. The Copley Medal carries a cash award of 25,000 British pounds (approximately US\$32,000).

—From a Royal Society announcement

Faltings Awarded Cantor Medal



Gerd Faltings

GERD FALTINGS of the Max Planck Institute for Mathematics has been awarded the 2017 Cantor Medal of the German Mathematical Society (DMV) for lifetime achievement. According to the prize citation, "Faltings' work revolutionized algebraic geometry and spread out to other areas of mathematics, for example, number theory." Faltings received his PhD in 1978 from the University of Münster and has held positions

there and at the University of Wuppertal and Princeton University. He was awarded the Fields Medal in 1986. Other

honors include a Guggenheim Fellowship (1988–1989), the Leibniz Prize (1996), the King Faisal International Prize (2014), and the Shaw Prize (2015). He is a foreign member of the Royal Society of London. The prize carries a cash award of 4,000 euros (approximately US\$4,500).

—From a DMV announcement

2017 Gödel Prize Awarded



Frank McSherry



Adam Smith

The 2017 Gödel Prize has been awarded to CYNTHIA DWORK of Harvard University, FRANK MCSHERRY, KOBBI NISSIM of Georgetown University and Harvard University, and ADAM SMITH of Pennsylvania State University for their paper "Calibrating noise to sensitivity in private data analysis," *Journal of Privacy and Confidentiality* 7 (2016), no. 3, which introduced the concept of differential privacy. Differentially private algorithms allow the analysis of sensitive data sets while preserving privacy of individuals' data. McSherry tells the *Notices*, "I've been alternating surfing and research for the past two years, instead of doing office work." Smith tells the *Notices*, "I grew up in Montreal and was hooked onto 'real' math by a CÉGEP (high-school) mathematics teacher,

François Laviolette, who is now a professor of computer science at Université de Laval. At McGill, I did a joint major in computer science and math because I was afraid that I wouldn't like research—a degree in computer science seemed like a good professional insurance plan. I ended up loving both research and computer science."

The Gödel Prize carries a cash award of US\$5,000. It is named in honor of Kurt Gödel, whose work has had immense impact upon scientific and philosophical thinking in the twentieth century. The prize recognizes major

contributions to mathematical logic and the foundations of computer science.

—From ACM and Penn State announcements

Williams Named Falconer Lecturer



Talithia Williams

TALITHIA WILLIAMS of Harvey Mudd College has been named the 2017 Etta Z. Falconer Lecturer of the Association for Women in Mathematics (AWM) and the Mathematical Association of America (MAA). She received her PhD in statistics from Rice University. She was a visiting assistant professor at Rice University for one year before joining the faculty at Harvey Mudd College. The prize

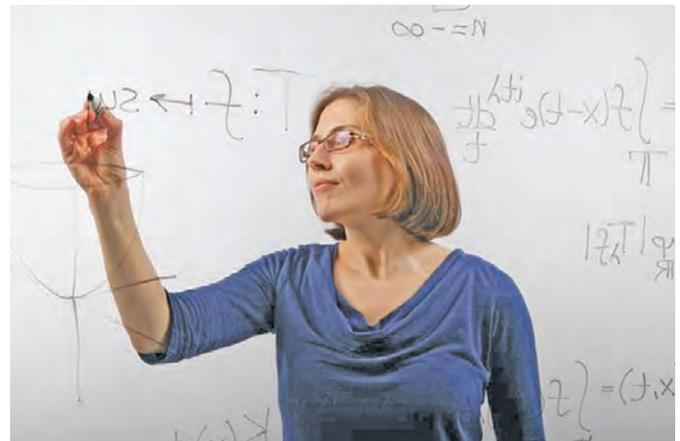
citation reads in part, “As illustrated in her popular TED talk ‘Own Your Body’s Data,’ Williams demystifies the mathematics process, using statistics as a way of seeing the world in a new light. She develops statistical models that emphasize the spatial and temporal structure of data and has partnered with the World Health Organization in developing a model to predict the cataract surgical rate for countries in Africa.” Williams has organized annual conferences on math and science for African American girls at Harvey Mudd College since 2011. She is secretary and treasurer of the EDGE (Enhancing Diversity in Graduate Education) Foundation and a member of the Mathematics Industry Internship Network advisory board and of the Mathematical Sciences Research Institute Human Resources Advisory Committee. She has served as governor for minority interests on the MAA board of governors and on the board of directors of the Society for the Advancement of Chicanos/Hispanics and Native Americans in Science (SACNAS).

—From an AWM announcement

Pierce Awarded Sadosky Prize

LILLIAN PIERCE of Duke University has been awarded the 2018 AWM-Sadosky Research Prize in Analysis by the Association for Women in Mathematics (AWM) in recognition of “her outstanding contributions to harmonic analysis and analytic number theory.” Pierce received her PhD in 2009 from Princeton University and has held appointments at the Institute for Advanced Study, Oxford University, and the Hausdorff Center for Mathematics.

The prize citation reads in part: “Pierce is one of the most talented, original, and visionary analysts of her generation. Her research spans and connects a broad spectrum of problems ranging from character sums in number theory to singular integral operators in Euclidean



Lillian Pierce

spaces. She has made far-reaching contributions to the study of discrete analogs of harmonic-analytic integral operators, taking inspiration in classical Fourier analysis, but drawing also on methods from analytic number theory such as the circle method and Diophantine approximation. In her recent work with Po Lam Yung, hailed as a remarkable breakthrough and a tour de force, she proved a polynomial Carleson theorem for manifolds, connecting two major directions of research in harmonic analysis and opening up entirely new research programs. Pierce’s work on estimating short character sums, on her own and in collaboration with Roger Heath-Brown, has produced the first significant advance in several decades on this central and difficult problem in analytic number theory. Pierce is highly regarded for her broad vision, deep knowledge of several areas of mathematics, and outstanding technical skill. Her leadership and influence in the field are widely acknowledged.” She has been a recipient of a Marie Curie Fellowship, an NSF Mathematical Sciences Postdoctoral Research Fellowship, and an NSF CAREER award.

The prize, named for Cora Sadosky, recognizes exceptional research in analysis by a woman early in her career.

—From an AWM announcement

Wood Awarded AWM-Microsoft Prize



Melanie Matchett Wood

MELANIE MATCHETT WOOD of the University of Wisconsin—Madison has been awarded the AWM-Microsoft Research Prize in Algebra and Number Theory of the Association for Women in Mathematics (AWM) “in recognition of her exceptional research achievements in number theory and algebraic geometry.” Wood received her PhD from Princeton University in 2009 and held appointments

at the American Institute of Mathematics, Stanford University, and the Mathematical Sciences Research Institute before joining the faculty at UWM.

According to the prize citation, Wood “has made deep and influential contributions to number theory and algebraic geometry. She excels at drawing connections between different areas of mathematics. Her work is a truly remarkable synthesis of number theory, algebraic geometry, topology, and probability. In arithmetic statistics, Wood, with her coauthors, gave the first heuristic account of the variation of the Mordell-Weil rank in families of elliptic curves, which predicts in particular that, contrary to widely held beliefs among the research community, elliptic curves over the rationals have absolutely bounded rank. Her joint work with Vakil suggests that the limiting behavior of many natural families of varieties should stabilize in a motivic sense. These results and conjectures have attracted considerable attention and spawned a substantial amount of follow-up research. More recently, she determined the behavior of the sandpile group of a random graph, thus proving an important conjecture in tropical geometry.” Wood’s honors include the AMS-MAA-SIAM Morgan Prize; the Elizabeth Lowell Putnam Prize in the Putnam Competition; an AIM Five-Year Fellowship, a Sloan Research Fellowship, and a Clay Mathematics Liftoff Fellowship; the Alice T. Schafer Prize of the AWM; and a 2015 Packard Fellowship. She is a Fellow of the AMS and is a recipient of the University of Wisconsin—Madison Vilas Early Career Investigator Award. The AWM-Microsoft Research Prize recognizes exceptional research in algebra and number theory by a woman early in her career.

—From an AWM announcement

Mathematical Sciences Awards at ISEF

The 2017 Intel International Science and Engineering Fair (ISEF) was held in Los Angeles, California, in May 2017. The Society for Science and the Public, in partnership with the Intel Foundation, selects a Best of Category contestant, who receives a cash award of US\$5,000; in addition, a US\$1,000 grant is given to the student’s school and the Intel ISEF Affiliated Fair he or she represents. The student chosen this year in the Mathematical Sciences category was KARTHIK YEGNESH of Methacton High School, Eagleville, Pennsylvania, for his project “The homotopy theory of parametrized objects.” Yegnesh also received the First Award of US\$3,000 and the Intel Foundation Cultural and Scientific Visit to China Award, which consists of an 11-day trip to the Chinese cities of Beijing, Chengdu, and Hong Kong to attend the China Adolescent Science and Technology Innovation Contest, the largest national science competition in China.

The award winners and the titles of their projects follow.

First Award (US\$3,000): KARTHIK YEGNESH, “The homotopy theory of parametrized objects.”

Second Award (US\$1,500): TORSTEIN VIK and ANE ESPESETH, Fagerlia Videregående Skole, More og Romsdal, Norway, “Motivic symbols and classical multiplicative functions”; CARL J. QUINES, Valenzuela City School of Mathematics and Science, Manila, Philippines, and MICHAEL SUN, Shanghai American School, Puxi, China, “Bounds on the metric dimensions for families of planar graphs”; and ANTON WU, Half Hollow Hills High School East, New York, “Discrete Ricci flow on discrete 3-manifolds.”

Third Award (US\$1,000): ARJUN RAMANI, West Lafayette Junior/Senior High School, West Lafayette, Indiana, “Mapping edges to nodes by utilizing Morton codes in stochastic Kronecker graphs”; JUEI-YIN LIN, Taipei First Girls High School, Chinese Taipei, “Which maps are 4-list colorable?”; GONEN ZIMMERMAN, Hakfar Hayarok High School, Israel, “Orthogonal polynomials and the two dimensional Nevai condition”; MATTHEW HASE-LIU, Lynbrook High School, San Jose, California, “Efficient point-counting algorithms for superelliptic curves via the Cartier operator and the Hasse-Weil bound.”

Fourth Award (US\$500): SATHWIK KARNIK, Massachusetts Academy of Mathematics and Science, Worcester, Massachusetts, “Safer security: A novel algorithm for detecting Carmichael numbers” (Karnik’s project also received the First Award (\$750) from the Air Force Research Laboratory in the math category); DAHLIA DRY, Fort Myers High School, Fort Myers, Florida, “Looking into the past for insight on the future: Predictive analytics and machine learning for time series data”; EGOR MOROZOV, Lyceum “Second School,” Russian Federation, “Generalized problem of Apollonius”; SVELII NOVIKOV, School 564, Russian Federation, “Generalized Jacobi identities and Jacobi elements of the group ring of the symmetric group”; DONA-MARIA IVANOVA, Baba Tonka Upper Secondary High School, Ruse, Bulgaria, “On the distortion of embedding perfect binary trees into low-dimensional Euclidean spaces”; STEPHANIE LI, Horace Mann School, New York, New York, and THOMAS LEE, Stuyvesant High School, New York, New York, “A 6-chromatic unit distance graph in space.”

A number of special awards were also given at the ISEF. The Ashtavadhani Vidwan Ambati Subbaraya Chetty Foundation First Award (US\$1,000) is given for projects that display outstanding creativity and ingenuity and have the potential to alleviate the human condition or mark a substantive advancement in the scientific field. NAVEEN DURVASULA of Montgomery Blair High School, Silver Spring, Maryland, received this award for the project “A participant-specific estimate of expected organ quality in kidney paired donation.” Mu Alpha Theta, the National High School and Two-Year College Mathematical Sciences Honor Society, gave a second award of US\$1,500 to GRADY DANIELS, Bartow High School, Bartow, Florida, for the project “An exploration in textual analysis” and a third award of US\$1,000 to DAHLIA DRY of Fort Myers High School for “Looking into the past for insight on the future: Predictive analytics and machine learning for time series data” and to JAMES CHEN of West Salem High School, Salem,

Oregon, for “Novel application of Collatz-like sequences to cryptographically secure pseudo-random number generation.” The National Security Agency Research Directorate awarded a first mathematics award of US\$1,000 to SHOBHITA SUNDARAM of Greenwich High School, Greenwich, Connecticut, for “Detection of premalignant pancreatic cancer via computational analysis of serum proteomic profiles.” The United Technologies Corporation awarded US\$3,000 in UTC stock and the University of Arizona made a tuition scholarship award to ARJUN RAMANI of West Lafayette Junior/Senior High School for “Mapping edges to nodes by utilizing Morton codes in stochastic Kronecker graphs.”

—From a Society for Science and the Public announcement

AMS Menger Awards at the 2017 ISEF



Front row (left to right): Savelii Novikov, Matthew Hase-Liu, Yuang-Jung Juang, Irina Mitrea; Back row (left to right): Dmitrii Mikhailovskii, Egor Morozov, Griffin Macris, Arjun Ramani

The Intel International Science and Engineering Fair (Intel ISEF), a program of the Society for Science and the Public and the world’s largest international precollege science competition, returned this May to the Los Angeles Convention Center in downtown Los Angeles, California. This annual event currently brings together more than 1,800 high school students from more than seventy-five countries, regions, and territories to present posters with results of their independent research. The projects are individual or done in teams of two.

The participants at this impressive international scientific event were selected from millions of students worldwide through local science fairs, followed by Intel ISEF-affiliated regional, state, and national fairs. The Intel ISEF provides awards of nearly US\$4 million in prizes and scholarships annually. Among these are special awards given by dozens of federal agencies, professional and

educational organizations, including the American Mathematical Society (AMS).

This year, there were fifty-five submissions in the mathematics category on a wide range of topics, both pure and applied. Participants in this category showed exceptional mathematical promise, originality, and talent. Since 1988, the AMS has presented awards to the students at ISEF with the best mathematics poster presentations; the awards have been named after Karl Menger since 1990. In 2017, as in the previous year, the AMS awarded one first-place prize, two second-place prizes, and four third-place prizes. In addition, five more students received honorable mentions. The selections for awards were made by the members of the 2017 AMS Menger Prize Committee and the AMS Special Awards Judges Group consisting of Irina Mitrea (Temple University), Keith Conrad (University of Connecticut), and Andrew Whelan (GKN Driveline).

The AMS Karl Menger Memorial Prize winners for 2017 are:

First-Place Award (US\$2,000): GRIFFIN MACRIS, New Prague High School, New Prague, Minnesota, “Polynomials in $Z[x]$ and irrationality measure.”

Second-Place Awards (US\$1,000): SAVELII NOVIKOV, School 564, St. Petersburg, Russian Federation, “Generalized Jacobi identities and Jacobi elements of the group ring of the symmetric group”; MATTHEW HASE-LIU, Lynbrook High School, San Jose, California, “Efficient point-counting algorithms for superelliptic curves via the Cartier operator and the Hasse-Weil bound.” Hase-Liu won a third-place award in the ISEF; Novikov won a fourth-place award.

Third-Place Awards (US\$500): EGOR MOROZOV, Lyceum “Second School,” Moscow, Russian Federation, “Generalized problem of Apollonius”; DMITRII MIKHAILOVSKII, School 564, St. Petersburg, Russian Federation, “Identities of Perkins monoid and millennium problem”; ARJUN RAMANI, West Lafayette Junior/Senior High School, West Lafayette, Indiana, “Mapping edges to nodes by utilizing Morton codes in stochastic Kronecker graphs”; YUAN-JUNG JUANG, National Taiwan Girl’s Senior High School, Taiwan City, Taiwan R.O.C, “Chance or coincidence-counting 3-arithmetic progression in block-generated Thue-Morse String.” Ramani won a third-place award in the ISEF, the United Technologies Corporation Special Award, and the University of Arizona tuition scholarship award. Morozov won a fourth-place award in the ISEF.

Honorable Mention Awards: DONA-MARIA IVANOVA, Baba Tonka Upper Secondary High School, Ruse, Bulgaria, “On the distortion of embedding perfect binary trees into low-dimensional Euclidean spaces”; SHILUN LI, Guangdong Experimental High School, Guangzhou, China, “A class of convex curves arising in capillary floating problem”; MAX LAND, Dutch Fork High School, Irmo, South Carolina, “Upper bound on the burning number of graphs”; ALEC LENG, Lincoln High School, Portland, Oregon, “Independence of the Miller-Rabin and Lucas probable prime tests”; GONEN ZIMMERMAN, Kfar Hayarok High School, Kokhav Ya’ir, Israel, “Orthogonal polynomials and the two dimensional Nevai condition.” Zimmerman won a third-place award in the ISEF; Ivanova won a fourth-place award.

The Intel ISEF finals for next year will be held May 13–18, 2018, in Pittsburgh, Pennsylvania. See <https://student.societyforscience.org/intel-isef>. The participation of the American Mathematical Society in ISEF is supported through income from the Karl Menger Fund, established by the family of the late Karl Menger, complemented by the AMS general fund (see www.ams.org/profession/menger-award). For more information about this program or to make contributions to this fund, contact the AMS Development Office, 201 Charles Street, Providence, RI 02904-2294; send email to development@ams.org; or telephone 401-455-4111.

—*Irina Mitrea, Temple University*
Keith Conrad, University of Connecticut
Andrew Whelan, GKN Driveline

Stokke Awarded PIMS Education Prize

ANNA STOKKE of the University of Winnipeg has been awarded the Pacific Institute for the Mathematical Sciences (PIMS) Education Prize for 2017. According to the prize citation, she “is an active and passionate advocate of numeracy, math education, and outreach. She is a co-founder of WISE, an organization dedicated to improving education in mathematics through strengthening both the curriculum and teacher training.” The prize recognizes individuals in Western Canada and Washington State who have played a major role in encouraging activities that enhance public awareness and appreciation of mathematics, as well as fostering communication among various groups concerned with mathematical education at all levels.

—*From a PIMS announcement*

Ford Foundation Fellows Announced

The Ford Foundation Fellowship Program has announced the names of 129 scholars who have received 2017 predoctoral, dissertation, and postdoctoral fellowships in all areas of scholarship. Two mathematical scientists were among the awardees. JORGE CISNEROS PAZ of the University of Washington was awarded a predoctoral fellowship in applications of mathematics. ROBERT M. WALKER of the University of Michigan, Ann Arbor, was awarded a dissertation fellowship in algebra or number theory. The Ford Foundation Fellowship programs seek to increase the diversity of the nation’s college and university faculties by increasing their ethnic and racial diversity, to maximize the educational benefits of diversity, and to increase the number of professors who can and will use diversity as a resource for enriching the education of all students.

—*From a Ford Foundation announcement*

USA Mathematical Olympiad

The 2017 USA Mathematical Olympiad (USAMO) was held April 19–20, 2017. 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 twelve highest scorers in this year’s AMO, listed in alphabetical order, were:

- ZACHARY CHROMAN, The Nueva School, San Mateo, California
- ANDREW GU, Pittsburgh Allderdice High School, Pittsburgh, Pennsylvania
- JAMES LIN, Phillips Exeter Academy, Exeter, New Hampshire
- DANIEL LIU, Redmond High School, Redmond, Washington
- MICHAEL REN, Phillips Academy, Andover, Massachusetts
- VICTOR RONG, Marc Garneau Collegiate Institute, Toronto, Ontario, Canada
- ASHWIN SAH, Jesuit High School, Portland, Oregon
- MIHIR SINGHAL, Palo Alto High School, Palo Alto, California
- ALEC SUN, Phillips Exeter Academy, Exeter, New Hampshire
- KADA WILLIAMS, Radnóti Miklós High School, Budapest, Hungary
- YUAN YAO, Phillips Exeter Academy, Exeter, New Hampshire
- WILLIAM ZHAO, Richmond Hill High School, Richmond Hill, Ontario, Canada

The twelve USAMO winners attended the Mathematical Olympiad Summer Program (MOSP) at the University of Nebraska, Lincoln, in June 2017. Ten of the twelve will take the team selection test to qualify for the US team. The six students with the highest combined scores from the test and the USAMO became members of the US team and will compete in the International Mathematical Olympiad (IMO) held in Brazil in July 2017.

—*From Mathematical Association of America*

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Photo of Menger Awardees courtesy of Society for Science and the Public.