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# Mathematics People

## Bhargava and Rodnianski Awarded Fermat Prize

MANJUL BHARGAVA of Princeton University and IGOR RODNIANSKI of the Massachusetts Institute of Technology have been awarded the 2011 Fermat Prize for Mathematics Research. Bhargava was honored “for his work on various generalizations of the Davenport-Heilbronn estimates and for his startling recent results (obtained with A. Shankar) on the average rank of elliptic curves,” and Rodnianski was selected “for his fundamental contributions to the study of the equations of general relativity and of the propagation of light on curved space-times (obtained with M. Dafermos, S. Klainerman, and H. Lindblad).” Bhargava received his B.A. from Harvard University in 1996 and his Ph.D. from Princeton University in 2001. Rodnianski received his B.A. in physics from St. Petersburg University and his Ph.D. in mathematics from Kansas State University.

The Fermat Prize is awarded every two years by the Institut de Mathématiques de Toulouse to one or more mathematicians under the age of forty-five in one of the following fields: calculus of variations or, more generally, partial differential equations; probability; and number theory. The prize carries a cash award of 20,000 euros (approximately US\$26,000).

—Elaine Kehoe

## Wohlmuth Awarded Leibniz Prize

BARBARA WOHLMUTH of the University of Technology, Munich, has been awarded the 2012 Leibniz Prize by the Joint Committee of the Deutsche Forschungsgemeinschaft (DFG, German Research Foundation) for her research achievements in numerical analysis, which enable direct applications in scientific and engineering computing. The prize citation reads in part: “A focus of her research is the numerics of partial differential equations, to which she has made key contributions, especially with her theoretical study of mortar domain decomposition methods. With this work, and with its translation into practical techniques, she has achieved an internationally leading role in her field. Wohlmuth’s research demonstrates an extraordinarily deep theoretical understanding that also produces better computational methods, for example in solid and fluid mechanics. In short, this new Leibniz Prize winner has advanced basic research with elegance, efficiency, and an eye on practical applications.”

The Leibniz Prize is considered the most important research award given in Germany. It carries a cash award

of 2.5 million euros (approximately US\$3,300,000), which can be used for up to seven years at the prizewinner’s own discretion for his or her scientific work.

—From a DFG announcement

## Malek Awarded Marshall Sherfield Fellowship

SAMAR MALEK of the Massachusetts Institute of Technology has been awarded a Marshall Sherfield Fellowship at the University of Bath, United Kingdom. A Ph.D. candidate in the Department of Civil and Environmental Engineering at MIT, she will conduct research on geometry and grid-shell structures at Bath. The fellowships, two of which are awarded each year, are funded by the Marshall Sherfield Fellowship Foundation and administered by the Marshall Commission; they enable American scientists or engineers to undertake postdoctoral research for a period of one to two academic years at a British university or research institute.

—Elaine Kehoe

## Sontag Receives 2011 IEEE Control Systems Award

EDUARDO D. SONTAG of Rutgers University has been named the recipient of the 2011 Control Systems Award of the Institute of Electrical and Electronics Engineers (IEEE). He was honored for “fundamental contributions to nonlinear systems theory and nonlinear feedback control.” His contributions include the control Lyapunov function (CLF), input-to-state stability (ISS), and related concepts that help in the design of stable nonlinear feedback systems. CLF provides control practitioners with the ability to make appropriate feedback control choices; the ISS concept helped tackle the difficulties presented by uncertainty in nonlinear systems. With ISS, he showed how to capture the effect of persistent disturbances in nonlinear systems, which has enabled engineers to solve many robust stabilization problems. The award is presented to an individual for outstanding contributions to control systems engineering, science or technology, and it consists of a bronze medal, certificate, and honorarium.

—From an IEEE announcement

## Lasiecka Receives SIAM Reid Prize

IRENA LASIECKA of the University of Virginia has received the 2011 W. T. and Idalia Reid Prize in Mathematics from the Society for Industrial and Applied Mathematics (SIAM). Established in 1993, this annual prize recognizes outstanding work in or other contributions to the broadly defined areas of differential equations and control theory. The prize fund was endowed by the late Mrs. Idalia Reid to honor her husband. The recipient of the prize receives a cash award of US\$10,000 and an engraved medal.

Lasiecka was honored for “her fundamental contributions in control and optimization theory, particularly for dynamical systems governed by partial differential equations and their applications.” She delivered a lecture at the SIAM Conference on Control and its Applications in July 2011.

—From a SIAM announcement

## AAAS Fellows 2011

Six researchers have been elected fellows of the Section on Mathematics of the American Association for the Advancement of Science (AAAS). They are: MARK S. ALBER, University of Notre Dame; INGRID DAUBECHIES, Duke University; MARK L. GREEN, University of California, Los Angeles; CLAUDIA NEUHAUSER, University of Minnesota, Rochester; RICHARD A. TAPIA, Rice University; and ROGER TEMAM, Indiana University.

—From an AAAS announcement

## 2011 Siemens Competition

Several high school students whose work involves the mathematical sciences have won prizes in the Siemens Competition in Math, Science, and Technology.

BRIAN KIM, a senior at Stuyvesant High School, New York, New York, was awarded a US\$50,000 scholarship for his project “Packing and Covering with Centrally Symmetric Disks”. He was mentored by Dan Ismailescu of Hofstra University. For millennia, people have been interested in how we can efficiently pack more objects into an area. Brian Kim examined packing and covering geometric shapes, a topic that he says “could be understood and appreciated with a basic geometry background, but required power tools, particularly vectors, with which to make new ground.” He was attracted to the idea of arranging shapes in space because this problem has been studied extensively by mathematicians. “The topic is simple yet at the same time extremely complex.” Kim first recognized his passion for math after joining his school’s math team. “There are no ‘textbook problems’ or solutions in math team, as ingenuity and cleverness are constant necessities.” He enjoys running, golf, handball, and playing the guitar, piano, and trombone. He would like to major in applied mathematics or computer science and dreams of

becoming a professor of mathematics at the Massachusetts Institute of Technology.

SITAN CHEN, a senior at Northview High School, Duluth, Georgia, received a scholarship worth US\$40,000 for his project “On the Rank Number of Graphs”. He was mentored by Jesse Geneson of MIT. His mathematics project has potential applications in optimizing circuit design, finding errors in large data structures more efficiently, and manufacturing complex products in industrial systems more quickly. His research could potentially result in a new method of studying graphs, an important area of mathematics. He is inspired by mathematics because of “the power of a single new idea to change the way we look at the world around us.” He was a National Finalist in the 2010 Siemens Competition. He is also an accomplished musician who has performed on piano and violin at Carnegie Hall. He is on the fencing team and organizes benefit concerts to raise funds for disaster relief. He hopes to study music or mathematics in college, with dreams of one day becoming a university professor.

The team of ANDREW XU, Lowell High School, San Francisco, California; KEVIN CHANG, Texas Academy of Mathematics and Science, Denton, Texas; and KEVIN TIAN, Westwood High School, Austin, Texas, were awarded a US\$20,000 scholarship for their joint project “Determining the Existence of Graceful Valuations of Various Families of Graphs”. They were mentored by Edward Early of St. Edward’s University. The team developed three new algorithms to construct graceful labelings for several families of graphs. Using graph theory as a model, their results could provide an important contribution toward the Graceful Tree Conjecture, one of the most famous unsolved problems in graph labeling. Xu, a senior, is a winner of the Dong Lieu Science Prize and founder and president of ScienceDays, a program that brings hands-on science experiments to elementary schools. He works on creating worksheets for YouTube math videos (created by Vi Hart), and enjoys basketball, swimming, and playing the piano. He is exploring various majors and hopes to become a research mathematician. Chang, a junior, is a three-time Texas American Regions Math League Gold Team Member and has qualified multiple times for the U.S. Math and Junior Math Olympiads. He organized a MathStar club for elementary and middle school kids in his community and is president of the math club. He plans to major in math and business, with hopes of pursuing a career in one of those fields. Tian, a senior, was a Regional Finalist in last year’s Siemens Competition. An accomplished musician, he is a viola player in his school orchestra and also plays the violin, piano, guitar, ukulele, and harmonica. He is fluent in Mandarin and proficient in French, active in community service, and enjoys playing basketball. He plans to major in economics or math and become a professor in mathematics or a related field.

—From a Siemens Competition announcement