MAA Prizes Presented in New Orleans

At the Joint Mathematics Meetings in New Orleans, Louisiana, in January 2010, the Mathematical Association of America (MAA) presented several prizes.

Gung and Hu Award for Distinguished Service

The Yueh-Gin Gung and Dr. Charles Y. Hu Award for Distinguished Service to Mathematics is the most prestigious award made by the MAA. It honors distinguished contributions to mathematics and mathematical education, in one particular aspect or many, whether in a short period or over a career.

Joseph Gallian is Distinguished Professor of Teaching and Professor of Mathematics at the University of Minnesota, Duluth. His service to mathematics takes form in three major activities: his work with Research Experiences for Undergraduates (REUs), his work with Project NExT, and his service to professional organizations and the mathematical community at large. He was one of the early proponents of undergraduates conducting mathematical research, and his REU at Duluth, which began in 1977, is widely regarded as the premier REU. The quality of the work at his REU is evidenced by the 150 papers by participants that grew out of their REU work and that have appeared in the *Journal of Algebra, Journal of Combinatorial Theory, Discrete Mathematics*, and others. In 2002 he was recognized by the Council on Undergraduate Research (CUR) with a Fellow Award given to members who have demonstrated sustained excellence in research with undergraduates.

Gallian has been involved with Project NExT since 1994, and became its codirector in 1998, assuming primary responsibility for many parts of the program and participating in developing the workshop program. He has coordinated Mathematics Awareness Month twice and served on more than forty national committees. He was a member of the CUR for eleven years, serving as chair of the mathematics and computer science division for part of that time. He has served as associate editor of *Mathematics Magazine* and *American Mathematical Monthly* and has directed or codirected five conferences. He has been a referee for forty journals.

Gallian has received teaching awards from the University of Minnesota Duluth, the Carnegie Foundation for the Advancement of Teaching, and the Mathematical Association of America (Haimo Award). He has received the MAA Trevor Evans and Carl B. Allendoerfer Awards and has been an MAA Polya Lecturer. He has served as vice president and president of MAA. He has also published more than one hundred articles in mathematical journals and other publications.

Haimo Awards for Teaching

The Deborah and Franklin Tepper Haimo Awards for Distinguished College or University Teaching were established in 1991. These awards honor college or university teachers who have been widely recognized as extraordinarily successful and whose teaching effectiveness has been shown to have had influence beyond their own institutions.

The 2011 Haimo Awards were presented to Erica Flapan, Karen Rhea, and Zvezdelina Stankova.

Erica Flapan has been teaching at the collegiate level for more than twenty-five years. She is currently Lingurn H. Burkhead Professor of Mathematics at Pomona College. Her outstanding teaching was recognized early; she received awards before earning her Ph.D., as a postdoctoral fellow, and as the recipient of the 2005 Irving Foundation Distinguished Faculty Fellowship for mentoring students of color at Pomona and the 2010 Southern California–Nevada Section Award for Distinguished College or University Teaching. She is best known for her dynamic, energetic classes that foster the participation of all students in the room. She was co-principal investigator of a grant to bridge mathematics and chemistry at Pomona, which helped to fund the creation of an Advanced Problem Solving course designed to give aspiring chemistry students needed mathematical strengthening. Her work in connecting mathematics and chemistry is further illustrated by her widely acclaimed book *When Topology Meets Chemistry: A Topological Look at Molecular Chirality* (Cambridge University Press and the Mathematical Association of America, 2000). Flapan teaches in several summer programs aimed at broadening interest in advanced mathematics among high school and undergraduate students and encouraging them to pursue graduate degrees. Her colleagues and students say that she serves both as a formal and informal advisor to many students; she is known as a tireless advocate and strong voice in support of diversity. Flapan received her B.A. from Hamilton College in 1977 and her Ph.D. from the University of Wisconsin at Madison in 1983. Her research interests are in low-dimensional topology and its

applications to chemistry and molecular biology. She has recently coauthored a book (with James Pommersheim and Tim Marks) titled *Number Theory: A Lively Introduction with Proofs, Applications, and Stories* (John Wiley & Sons, 2010).

Karen Rhea has been a faculty member in colleges and universities for about thirty years, the last decade at the University of Michigan. In 1998, while a professor at the University of Southern Mississippi, she was awarded the MAA Louisiana-Mississippi Section's Award for Distinguished College or University Teaching of Mathematics. She is director of the introductory program at Michigan, which serves about 4,500 students annually in precalculus and the first year of calculus and which is widely viewed as one of the most successful programs of its scope in the country. At the beginning of each academic year she runs an intense training week for all new instructors in the introductory program. She has received praise for helping instructors find their own voices, and she continues to work with them after they leave the program. Many of the instructors she works with go on to become faculty elsewhere, broadening her influence on mathematics instruction. Her students say that her enthusiasm and eagerness to teach make class interesting and that she presents the material as clearly as possible. She has contributed to the general development of the calculus curriculum and to the discourse on how to teach calculus effectively through her work with the Harvard Calculus Consortium. Not only has her work made significant contributions to the content of the introductory courses at Michigan but it also has contributed to the development of a calculus curriculum that aims to get students actively involved in their own learning throughout the country. Rhea has given numerous talks and workshops, has served on the MAA Committee on Professional Development, and was recently appointed to the Committee on the Teaching of Undergraduate Mathematics.

Zvezdelina Stankova's goals in teaching are to develop students' ability to do independent thinking, no matter what the level of the student, from the middle and high school students in the Math Circles she works with through the senior undergraduate mathematics majors of Mills College and the University of California, Berkeley. As a full-time faculty member at Mills College, Stankova has also taught one course per year at the University of California, Berkeley, for eleven years, and, in 1998, she founded the Berkeley Math Circle, a weekly program for fifty Bay Area middle and high school students. She has been the Berkeley Math Circle's director and a frequent lecturer since the beginning. In addition, she has been directly involved in the creation of Math Circles in seven more cities in the United States and Canada and has contributed to the creation of Circles in twelve other cities. She was coeditor of the book *A Decade of the Berkeley Math Circle* (American Mathematical Society, 2008). With Paul Zeitz and Hugo Rossi, she cofounded the Bay Area Mathematical Olympiad, an annual competition among 250 students from forty-five schools in the Bay Area. Several of these students have gone on to be members of the U.S.A. Mathematical Olympiad team. Stankova has been actively involved in the U.S. participation in the International Mathematical Olympiad, including as an instructor in the training camps of the USAMO. Her students at every level are enthusiastic about her teaching and mentoring, indicating that her classes are challenging and fun. They rave about her teaching ability, her enthusiasm for mathematics, and her capacity to dramatically change their attitudes toward mathematics and their perceptions of their own mathematical abilities. Stankova was drawn to mathematics through her Math Circle in Bulgaria, and she consequently earned silver medals at the International Mathematical Olympiads. She completed a B.A./M.A. degree at Bryn Mawr in 1992 and received her Ph.D. in algebraic geometry from Harvard University in 1998.

Chauvenet Prize

The Chauvenet Prize recognizes a member of the MAA who has written an outstanding expository article. First awarded in 1925, the prize is named for William Chauvenet, who was a professor of mathematics at the United States Naval Academy.

Bjorn Poonen of the Massachusetts Institute of Technology received the 2011 Chauvenet Prize for his article "Undecidability in number theory", *Notices of the American Mathematical Society* **55** (2008), no. 3, 344–350. Hilbert's tenth problem (in his famous list of twenty-three problems posed in 1900) asks if there is an algorithm to decide whether, for a given polynomial $p(x_1,\ldots, x_n)$ in n variables with integer coefficients, there exist integers $a_1,\ldots, a_n$ such that $p(a_1,\ldots, a_n) = 0$. Although a proof that no such algorithm exists was found in 1970, "Hilbert's tenth", with its many ramifications and generalizations, continues to stimulate mathematicians today. For example, it is known that there is no algorithm to decide the existence of integer solutions to integer-coefficient polynomial equations in eleven variables, but what about just two variables? We don't know yet. Poonen's masterful exposition strikes a perfect balance between technicality (for the experts) and accessibility (for the rest of us). His story involves Turing machines, quantum computers, Diophantine sets, undecidability, prime-producing polynomials, and the Riemann hypothesis. It is a treat to find such a diversity of ideas wrapped up neatly into a single fascinating package. Poonen received his A.B. in mathematics and physics from Harvard University in 1989 and his Ph.D. in mathematics from the University of California, Berkeley, in 1994.

He taught at Berkeley until 2008, then moved to MIT. His research focuses on number theory and algebraic geometry, and he has also worked in combinatorics, probability, and computer science. He is the founding managing editor of *Algebra and Number Theory.*

Euler Book Prize

The Euler Book Prize is given to the author(s) of an outstanding book about mathematics. Mathematical monographs at the undergraduate level, histories, biographies, works of mathematical fiction, and anthologies are among those types of books eligible for the prize. The prize was given for the first time in 2007, the 300th anniversary of the birth of Leonhard Euler.

Timothy Gowers has been awarded the 2011 Euler Book Prize for his editorial work on *The Princeton Companion to Mathematics* (Princeton University Press, 2008). The book is a vast compendium of mathematical information in the form of essays by experts on a wide variety of fields, in most cases bringing the reader up to date on developments in recent decades in a way that nonexperts can understand and appreciate. The Committee understood that the book is the work of many, but singled out Gowers because of his extraordinary achievement in putting this whole volume together (over 1,000 pages of text) and also for writing a beautiful 76-page introduction, as well as 68 of the 288 individual entries. The organization is thematic, with sections on the origins of modern mathematics, mathematical concepts, the various branches of the subject, the big problems, biographical essays, and a section on the influence of mathematics on other fields. The book has something for everyone who has any interest in mathematics. Many sections can be read with great benefit and considerable pleasure by mathematical amateurs and students. Overwhelmed as we are in the twenty-first century by the enormous size of mathematics, the professional mathematician can benefit from finding out what colleagues are doing in branches of mathematics that did not exist when many of us were in school. Anyone who wonders about "mirror symmetry", "quantum groups", "vertex operator algebras", "automorphic forms", or "Ricci flow", topics referred to in the current mathematical literature or even in the newspapers, can find help here. Gowers's early research was in the geometry of Banach spaces. He solved several old problems in the area, some posed by Banach himself. More recently, he has worked in additive combinatorics: his new proof of Szemerédi's theorem has been particularly influential. In 1996 he was awarded a European Mathematical Society prize, and he received a Fields Medal in 1998.

David P. Robbins Prize

This prize was established in memory of David P. Robbins by members of his family. Robbins, who died in 2003, received his Ph.D. in 1970 from MIT. He was a long-time member of the Institute for Defense Analysis Center for Communication Research and a prolific mathematician whose work (much of it classified) was in discrete mathematics. The prize is for a paper with the following characteristics: it shall report on novel research in algebra, combinatorics, or discrete mathematics and shall have a significant experimental component, and it shall be on a topic which is broadly accessible and shall provide a simple statement of the problem and clear exposition of the work. This prize is awarded every three years.

The 2011 David P. Robbins Prize was awarded to Mike Paterson, Warwick University; Yuval Peres, Microsoft Research, University of Washington, University of California, Berkeley; Mikkel Thorup, AT&T Labs; Peter Winkler, Dartmouth College; and Uri Zwick, Tel Aviv University, for their innovative work on two papers: "Overhang", *American Mathematical Monthly* **116**, January 2009, and "Maximum Overhang", *American Mathematical Monthly* **116**, December 2009. The two papers together solve, to within a constant factor, the classic problem of stacking blocks on a table to achieve the maximum possible overhang, i.e., reaching out the furthest horizontal distance from the edge of the table. The January paper was written by Paterson and Zwick, and the December paper was written by all five authors. The January paper proves the surprising result that n blocks can be (cunningly) stacked using suitable counterbalancing to achieve an overhang proportional to $n(1/3)$. (Many people have assumed that the overhang of about $\log n$, given by the standard calculus exercise, is optimal.) The December paper gave a complementary argument, showing that an overhang proportional to $n(1/3)$ is, in fact, the largest possible for any balanced stack. The papers describe an impressive result in discrete mathematics; the problem is easily understood and the arguments, despite their depth, are easily accessible to any motivated undergraduate.

Certificates of Meritorious Service

Each year the MAA presents Certificates of Meritorious Service for service at the national level or for service to a section of the MAA. Those honored in 2011 are: Joseph Gallian (University of Minnesota, Duluth), North Central Section; John Hagood (Northern Arizona University), Southwest Section; Allen Hibbard (Central College, Pella, Iowa), Iowa Section; Joseph Malkevitch (York College, CUNY), Metro New York Section; Jenny McNulty (University of Montana), Pacific Northwest Section; and Gerald Porter (University of Pennsylvania), Eastern Pennsylvania and Delaware Section.