Joint Mathematics Meetings
San Diego
January 6–9, 2008

January 2008 Prizes and Awards

4:25 P.M., Monday,
January 7, 2008

Program

Opening Remarks
Joseph A. Gallian, President
Mathematical Association of America

Leonard Eisenbud Prize for Mathematics and Physics
American Mathematical Society

Levi L. Conant Prize
American Mathematical Society

Bôcher Memorial Prize
American Mathematical Society

Award for Distinguished Public Service
American Mathematical Society

Alice T. Schafer Prize for Excellence in Mathematics by an Undergraduate Woman
Association for Women in Mathematics

Louise Hay Award for Contributions to Mathematics Education
Association for Women in Mathematics

Deborah and Franklin Tepper Haimo Awards for Distinguished College or University Teaching of Mathematics
Mathematical Association of America

Euler Book Prize
Mathematical Association of America

Chauvenet Prize
Mathematical Association of America

Frank and Brennie Morgan Prize for Outstanding Research in Mathematics by an Undergraduate Student
American Mathematical Society
Mathematical Association of America
Society for Industrial and Applied Mathematics

Communications Award
Joint Policy Board for Mathematics

Frank Nelson Cole Prize in Number Theory
American Mathematical Society

Joseph L. Doob Prize
American Mathematical Society

Leroy P. Steele Prize for Lifetime Achievement
American Mathematical Society

Leroy P. Steele Prize for Mathematical Exposition
American Mathematical Society

Leroy P. Steele Prize for Seminal Contribution to Research
American Mathematical Society

Certificates of Meritorious Service
Mathematical Association of America

Beckenbach Book Prize
Mathematical Association of America

David P. Robbins Prize
Mathematical Association of America

Yueh-Gin Gung and Dr. Charles Y. Hu Award for Distinguished Service to Mathematics
Mathematical Association of America

Closing Remarks
James G. Glimm, President
American Mathematical Society

Leonard Eisenbud Prize for Mathematics and Physics

This prize was established in 2006 in memory of the mathematical physicist Leonard Eisenbud (1913–2004) by his son and daughter-in-law, David and Monika Eisenbud. Leonard Eisenbud was a student of Eugene Wigner. He was particularly known for the book *Nuclear Structure* (1958), which he coauthored with Wigner. A friend of Paul Erdös, he once threatened to write a dictionary of *English to Erdös and Erdös to English*. He was one of the founders of the physics department at SUNY Stony Brook, where he taught from 1957 until his retirement in 1983. In later years he became interested in the foundations of quantum mechanics and in the interaction of physics with culture and politics, teaching courses on the antiscience movement. His son, David, was president of the American Mathematical Society 2003–2004.

The prize will honor a work or group of works that brings mathematics and physics closer together. Thus, for example, the prize might be given for a contribution to mathematics inspired by modern developments in physics or for the development of a physical theory exploiting modern mathematics in a novel way.

Citation

Hirosi Ooguri, Andrew Strominger, and Cumrun Vafa

The Eisenbud Prize for 2008 is awarded to Hirosi Ooguri, Andrew Strominger, and Cumrun Vafa for their paper “Black hole attractors and the topological string”, *Physical Review D (3)* 70 (2004), 106007. This paper contains a beautiful and highly unexpected proposal: that the counting of black hole states in certain string theories obtained by compactification on a Calabi-Yau manifold X can be expressed in terms of the topological string partition function of X (i.e., in terms of the so-called Gromov-Witten invariants of X). The proposal explains some mysterious earlier results to the effect that certain scattering amplitudes in physical string theory can be expressed in terms of the topological string; the authors here argue that these amplitudes control the counting of microscopic states of certain electrically and magnetically charged black holes. Although based on physical reasoning, the proposal touches on a number of different areas of mathematics. Black holes and enumerative invariants such as Gromov-Witten invariants are both intensively studied but had not been significantly related to each other prior to this work.

Biographical Note

Hirosi Ooguri

Hirosi Ooguri was born on March 13, 1962, in Japan. He attended Gifu High School, whose notable alumni include Teiji Takagi, who developed class field theory. Ooguri received a B.A. in 1984 and an M.S. in 1986 from Kyoto University.

In 1986 Ooguri became an assistant professor at the University of Tokyo. After a year at the Institute for Advanced Study in Princeton, he moved to the University of Chicago as an assistant professor in 1989. In the same year he was awarded an Sc.D. from the University of Tokyo. A year later he returned to Japan as an associate professor at the Research Institute for Mathematical Sciences in Kyoto University. In 1994 he became a professor at the University of California at Berkeley and was appointed a faculty senior scientist at the Lawrence Berkeley National Laboratory in 1996. Since 2000 he has been at Caltech, where he is now Fred Kavli Professor of Theoretical Physics.

In 2007 Ooguri and his friends in Japan proposed establishing the Institute for the Physics and Mathematics of the Universe at the University of Tokyo. The proposal was approved with funding for two hundred staff scientists and visitors for the next ten years. Ooguri will continue to keep his intellectual base at Caltech, but he will spend a few months a year in Tokyo as a principal investigator at the new institute to lead activities at the interface of mathematics and physics.

Response from Hirosi Ooguri

I am deeply honored to share the Leonard Eisenbud Prize for Mathematics and Physics with such outstanding physicists as Andy Strominger and Cumrun Vafa.

In an early stage of my career I had the good fortune to work with Tohru Eguchi in Tokyo and to experience the power of quantum field theory in revealing new connections between different areas of mathematics. I have collaborated with Cumrun Vafa for over eighteen years on various aspects of gauge theory and string theory, including $N=2$ string theory, topological string theory, gauge theories on D-branes, and their geometric engineering. Our collaborations have almost always aimed to discover hidden geometric structures in physical problems and to exploit them to develop new theoretical tools. Cumrun brims over with ideas that he has generously shared with me and many others. I thank him for the collaboration and friendship. I have always admired Andy Strominger for his creative insights, and I am happy to have had the chance to collaborate with both Andy and Cumrun in the academic year of 2003–2004, which led to the paper cited above. In this work we formulated a conjecture that relates two different concepts: topological string theory, which computes the Gromov-Witten invariants, and the counting of quantum states of black holes, which has to do with topological invariants of gauge theories in various dimensions. I would like to make a brief comment on each of them.

Topological string theory was introduced by Edward Witten. The construction of mirror pairs of Calabi-Yau manifolds by Brian Greene and Ronen Plesser and their application to the computation of the genus-zero Gromov-Witten invariants by Philip Candelas, Xenia De La Ossa, Paul Green, and Linda Parkes sparked interest in the mathematics community. I spent the academic year of 1991–1992 at Harvard University and collaborated with Michael Bershadsky, Sergio Cecotti, and Cumrun Vafa to generalize their results to higher genus. We found that the higher genus topological string partition functions can be used to compute certain scattering amplitudes in superstring theory compactified on a Calabi-Yau manifold. It took another twelve years to find the compelling question in physics, i.e., the counting of quantum states of black holes, to which these amplitudes give an answer. We also derived the holomorphic anomaly equations for the topological string partition functions and developed a method to solve them recursively in the genus. In this work we made several mathematical conjectures. Recently, the conjecture on the genus-one Gromov-Witten invariants for a quintic threefold was proven by Aleksey Zinger, and the conjecture on the so-called BCOV torsion for the mirror of the quintic was proven by Hao Fang, Zhiqin Lu, and Ken-ichi Yoshikawa. The conjectures for genus greater than one remain open.

The black hole entropy formula was proposed by Jacob Bekenstein and Stephen Hawking based on a remarkable mathematical analogy between thermodynamics and black hole mechanics and on the semiclassical theory of black hole radiance. It was expected that if there is a theory that successfully unifies quantum mechanics and general relativity, in such a theory the Bekenstein-Hawking formula can be derived as the statistical entropy of quantum states of black holes. Thanks to the D-brane construction by Joseph Polchinski for a certain class of black holes in string theory, it has become possible to count quantum states by evaluating topological invariants of gauge theory on D-branes, such as the Euler characteristic of instanton moduli space. The counting was carried out by Strominger and Vafa in 1996, and they found a perfect agreement with the Bekenstein-Hawking formula in the limit of large black holes, for which the approximation used by Bekenstein and Hawking becomes precise. Our paper cited above showed that this approximation can be significantly improved by using topological string theory. I was surprised and delighted to find the application of topological string theory to the counting of quantum states of black holes. This reaffirmed my belief that exact results in quantum field theory and string theory have enduring value and unintended applications.

When I was a high school student, physics was my least favorite subject until I learned calculus. Clearly, physicists need mathematics to formulate fundamental laws of nature. In return, physicists' search for fundamental laws has inspired many important developments in mathematics. In the past couple of decades interactions of mathematicians and physicists have been particularly intense and productive in the area involving quantum field theory and string theory. Since neither of them has a proper definition, mathematicians often view them as black boxes from which interesting conjectures materialize. I think that collaborations of mathematicians and physicists can be elevated to an even higher level if these physical theories are placed on more solid mathematical foundations.

I would like to thank Andy Strominger and Cumrun Vafa for the wonderful collaboration. Topological string theory has been developed by many people. In particular, I would like to acknowledge the influence of the earlier work by Gabriel Lopes Cardoso, Bernard de Wit, and Thomas Mohaupt. I would like to thank the American Mathematical Society and the Eisenbud Prize Committee for recognizing the progress in this line of research. I am grateful to my teachers, collaborators, and friends for helping me make contributions to this area. Finally, I would like to thank my wife, Kyoko, for her love and support and my daughter, Tomoko, for adding extra dimensions to my life.

Biographical Note
Andrew Strominger

Andrew Strominger, the son of biochemist Jack Strominger, is an American theoretical physicist whose research centers around string theory. He is currently a professor at Harvard University, cofounder of the Center for the Fundamental Laws of Nature at Harvard, and a senior fellow at the Society of Fellows. He received his undergraduate degree from Harvard University in 1977 and his Ph.D. from Massachusetts Institute of Technology in 1982 under the supervision of Roman Jackiw. His wide and varied contributions to physics include:

- a paper with Cumrun Vafa that explains the microscopic origin of the black hole entropy, originally calculated thermodynamically by Stephen Hawking and Jacob Bekenstein from string theory;
- a paper with Philip Candelas, Gary Horowitz, and Edward Witten about the relevance of Calabi-Yau manifolds for obtaining the Standard Model from string theory;
- other articles discussing the dS/CFT correspondence (a variation of AdS/CFT correspondence), S-branes (a variation of D-branes), and OM-theory (with Shiraz Minwalla and Nathan Seiberg);
- research on massless black holes in the form of wrapped D3-branes that regulate the physics of a conifold and allow topology change interpretation of mirror symmetry as a special case of T-duality (with Eric Zaslow and Shing-Tung Yau).

The fundamental laws of nature as we currently understand them are both incomplete and contradictory. Unsolved problems concerning these laws include the incompatibility of quantum mechanics and Einstein's theory of gravity, the origin of the universe, and the origin of the masses of the elementary particles. Professor Strominger's research has concerned various aspects of these problems. The emergence of string theory as the most promising approach to these problems began with Strominger's 1985 codiscovery of so-called Calabi-Yau compactifications. This construction demonstrated that string theory not only reconciles quantum mechanics and gravity but can also contain within it electrons, protons, photons, and all the other observed particles and forces and hence is a viable candidate for a complete unified theory of nature. In 1991 Strominger codiscovered the brane solutions of string theory, which have played a crucial role in unraveling the beautiful mathematical structure and duality symmetries of the theory. The branes were eventually used by Strominger and collaborators to give a microscopic explanation of how black holes are able to store information, finally resolving a deep paradox uncovered by Hawking and Bekenstein a quarter century earlier. He and coworkers also used the branes to derive new relations in algebraic geometry, equating the moduli space of a brane in a Calabi-Yau space to the mirror Calabi-Yau. Preliminary attempts have been made to apply these insights to cosmology. Current research continues attempts to better understand the fundamental laws of nature.

Response from Andrew Strominger

I am greatly honored to receive, along with my collaborators Cumrun Vafa and Hirosi Ooguri, the first Leonard Eisenbud Prize of the American Mathematical Society for our work demonstrating a connection between Gromov-Witten invariants and microstate degeneracies of black hole attractors. Our success in discovering this connection relied on the uncanny ability of physical reasoning to lead to insights into pure mathematics.

Biographical Note

Cumrun Vafa

Cumrun Vafa is a Donner Professor of Science at Harvard University, where he teaches and does research on theoretical physics.

Cumrun was born in Tehran, Iran, in 1960 and came to the U.S. for continuation of his education in 1977. He earned his B.S. in mathematics and physics from MIT in 1981. He went on to earn his Ph.D. in physics from Princeton University in 1985 under the supervision of Edward Witten. He came to Harvard University in 1985 as a junior fellow of the Harvard Society of Fellows and has been on the Harvard faculty since 1988. He is married to Afarin Sadr, and they are proud parents of three sons: Farzan, Keyon, and Neekon.

Response from Cumrun Vafa

It is a great pleasure to receive the 2008 Leonard Eisenbud Prize, together with my collaborators. I view this not only as an acknowledgment of a single paper but also as an appreciation of the work of so many physicists and mathematicians that led to this work. With the intrinsic beauty of the connection between mathematics and physics and with so many talented researchers, I hope to witness the continuing development of this remarkable area of science.

I am greatly indebted for the support I have received from my family and my parents, as well as my teachers over the years.

Levi L. Conant Prize

This prize was established in 2000 in honor of Levi L. Conant to recognize the best expository paper published in either the *Notices of the AMS* or the *Bulletin of the AMS* in the preceding five years. Levi L. Conant (1857–1916) was a mathematician who taught at Dakota School of Mines for three years and at Worcester Polytechnic Institute for twenty-five years. His will included a bequest to the AMS effective upon his wife's death, which occurred sixty years after his own demise.

Citation

J. Brian Conrey

The Riemann Hypothesis (RH) has a strong claim to being the outstanding open problem in mathematics. Much has been written about RH, but rarely with anything like the scope that Conrey covers in but a dozen *Notices* pages ("The Riemann Hypothesis", *Notices Amer. Math. Soc.* 50 (2003), 341–353), outlining the mathematical context that justifies the importance of RH, key moments in the problem's 140 plus-year history, known partial results and blind alleys, various threads of numerical and theoretical evidence, and suggestive connections with disparate branches of mathematics and theoretical physics. The mathematical exposition is enhanced by the judicious use of anecdotes illustrating the human drama of the quest for a proof and of figures that help the reader visualize the zeta function as a function of a complex variable and the key connections between the distribution of prime numbers, the distribution of the zeros of the Riemann zeta function, and conjecturally also the distribution of the eigenvalues of random Hermitian operators.

Conrey remarks on one of those fascinating connections (Gauss's class number problem and a "conspiracy of L-functions") that "we seem to be players in the middle of a mystery novel." The same can be said of the status of the Riemann Hypothesis itself. Conrey has given a masterly and lucid introduction to the plot thus far, to the detectives who brought us to this point, and to what may be called the main suspects: the mathematical structures that might be expected to figure in the eventual resolution of this central mystery of modern mathematics.

Biographical Note

Dr. J. Brian Conrey is the founding executive director of the American Institute of Mathematics (AIM). In this position, he oversees AIM's operations and helps to initiate programs that further AIM's goal of solving problems through focused collaborative efforts.

Conrey received his Bachelor of Science from Santa Clara University in 1976, his doctorate from the University of Michigan in 1980, and conducted his post-doctoral studies at the University of Illinois, 1980–1982, and the Institute for Advanced Study in Princeton, 1982–1983. He was awarded an A. P. Sloan Fellowship in 1986.

Conrey was a mathematics professor at Oklahoma State University, serving as head of the department from 1991 to 1997. He joined AIM in 1997. In 2005 he also became a professor at the University of Bristol.

Conrey's mathematical specialty is number theory, and he has a particular interest in the nearly 150-year-old Riemann Hypothesis. He has published more than fifty research papers and serves as an editor of the *Journal of Number Theory*.

Conrey has also helped launch several outreach programs for students interested in mathematics, including the San Jose Math Circle, MathCounts and the Math MardiGras in Morgan Hill, and has been involved in several REU programs working with undergraduates doing research.

Conrey lives in San Martin, California, with his wife, Jan. They have three children: Brianna, Jennifer, and Rick.

Response from J. Brian Conrey

I am honored to receive the Levi Conant Prize for my article on the Riemann Hypothesis. I really enjoyed working on it and found the endeavor to be interesting and instructive. I hope that the article will play some small role in the eventual solution of this beautiful problem, perhaps by inspiring a young mathematician to think about it.

I would like to thank the people who helped me with the writing: Harold Boas, Brianna Conrey, David Farmer, Roger Heath-Brown, and K. Soundararajan, and with the graphics: Sandra Frost, Andrew Odlyzko, Mike Rubinstein, and Nina Snaith.

Citation

Shlomo Hoory, Nathan Linial, and Avi Wigderson

Expander graphs are (finite) graphs that are both sparse and highly connected: a sequence of graphs G_i of increasing size is a family of expander graphs if there is an $\varepsilon > 0$ such that for each i and each subset S of G_i, the number of edges from S to its complement is at least $\varepsilon |G_i|$. Since their introduction thirty years ago, the study of these graphs has blossomed into a substantial area of research with many branches. One direction involves understanding the relationship of graph expansion to other graph invariants, most notably the second largest eigenvalue of its adjacency matrix. Identifying classes of expanders and proving that they are indeed expanders involves a variety of techniques from harmonic analysis, group representation theory, graph theory, and information theory. Expanders have found a variety of applications within the theory of computing and other fields, from direct application to interconnection networks, to more surprising applications such as the problem of understanding the relative power of deterministic and randomized computation, the construction of computationally efficient error-correcting codes, and the construction of finite metric spaces that cannot be well approximated in Euclidean space. These applications confirm that computer science is an area with problems, techniques, and results that engage mathematicians in many fields.

This very readable article, "Expander graphs and their applications", *Bull. Amer. Math. Soc. (N.S.)* 43 (2006), 439–561, provides a thorough overview of these and other developments. It is readily accessible for self-study by experienced graduate students and, with appropriate guidance, could even be appropriate for an advanced undergraduate seminar.

Biographical Note
Shlomo Hoory

Shlomo Hoory received his Ph.D. in computer science in 2002 under Nathan Linial at the Hebrew University of Jerusalem. His postdoctoral work was done at the University of Toronto and at the University of British Columbia. Currently he is working at the IBM Haifa research labs in the Constraint Satisfaction and Machine Learning group.

Response from Shlomo Hoory

It is a great honor for me to receive the Conant Prize for my joint paper with Nati Linial and Avi Wigderson. I would like to thank Nati and Avi for the pleasure of being a teacher assistant in their course on expander graphs at the Hebrew University and later for their help and encouragement while I taught the course at the University of Toronto. Special thanks are due to the students of the course who wrote the scribe notes that formed the foundation for our paper and to Mark Goresky, who convinced us to make the effort and turn the notes into a full-scale review of the subject. Mark Goresky also assisted us throughout the writing process. I see great potential in the field of expander graphs for advancing areas in mathematics, computer science, and engineering. I hope that our expository paper will make the subject accessible to a wide audience.

Biographical Note
Nathan Linial

Nathan (Nati) Linial was born in Haifa, Israel, in 1953. He received his undergraduate education in mathematics at the Technion. His Ph.D. thesis in graph theory was written under Micha Perles at the Hebrew University of Jerusalem in 1978. Following a postdoctoral period at UCLA, he returned to the Hebrew University to become a professor of computer science, a position he has held ever since. His main research interests include the mathematical foundations of computer science and combinatorics. He is particularly fascinated by the interaction between geometry and combinatorics. In addition, he is interested in mathematical problems that are motivated by other scientific disciplines, such as bioinformatics.

Response from Nathan Linial

I was first exposed to graph theory in a class for mathematically oriented high school kids. As my mathematical horizons expanded, I came to like the connections between combinatorics and other parts of mathematics. There are few places where these connections shine as brightly as in the study of expander graphs. I believe that the full potential impact of combinatorics on the rest of mathematics is only starting to reveal itself and the study of expander graphs can give us some idea of the true power of these connections.

Biographical Note

Avi Wigderson

Avi Wigderson is a professor at the School of Mathematics, Institute for Advanced Study. He obtained his B.Sc. in computer science from the Technion in 1980 and his Ph.D. from Princeton in 1983. He was a member of the faculty at the Hebrew University in Jerusalem from 1986 to 2003 and is currently a member of the mathematics faculty at the Institute for Advanced Study in Princeton. He joined the permanent faculty of the Institute for Advanced Study in 1999. His research interests lie principally in complexity theory, algorithms, randomness, and cryptography. His awards include the Nevanlinna Prize (1994).

Response from Avi Wigderson

I am honored to receive the Conant Prize for my joint paper with Shlomo Hoory and Nati Linial. Many thanks are in order. First and foremost, to Nati and Shlomo for the pleasure of teaching together (at the Hebrew University) the course which resulted in this manuscript and for the big effort of writing it. Thanks to the many students of this course whose scribe notes formed the foundation of that paper. Special thanks to Mark Goresky, who convinced us to write it and whose enthusiasm and meticulous reading of earlier drafts helped get us through the process. Thanks to the many others who read and corrected earlier versions. And finally, thanks to the many colleagues and collaborators from whom I learned so much in the wonderful world of expander graphs.

Bôcher Memorial Prize

This prize, the first to be offered by the AMS, was founded in memory of Professor Maxime Bôcher, who served as president of the AMS 1909–1910. The original endowment was contributed by members of the Society. It is awarded for a notable paper in analysis published during the preceding six years. To be eligible, the author should be a member of the American Mathematical Society or the paper should have been published in a recognized North American journal. Currently, this prize is awarded every three years.

Citation

Alberto Bressan

Alberto Bressan of Penn State University is awarded the Bôcher Prize for his fundamental works on hyperbolic conservation laws. Professor Bressan has made important contributions to the well-posedness theory; the results have been summarized in his monograph *Hyperbolic Systems of Conservation Laws. The One-Dimensional Cauchy Problem*, Oxford Lecture Series in Mathematics and Its Applications, vol. 20, Oxford University Press, Oxford, 2000, xii + 250 pp.

Another landmark achievement is the work on zero dissipation limit (with Stefano Bianchini), "Vanishing viscosity solutions of nonlinear hyperbolic systems", *Ann. of Math. (2)* 161 (2005), no. 1, 223–342.

Biographical Note

Alberto Bressan was born in Venice, Italy. He completed his undergraduate studies at the University of Padova, Italy, and received a Ph.D. from the University of Colorado, Boulder, in 1982. He has held faculty positions at the University of Colorado and at the International School for Advanced Studies in Trieste, Italy. Presently he is Eberly Chair Professor of Mathematics at The Pennsylvania State University.

His scientific interests lie in the areas of differential inclusions, control theory, differential games, partial differential equations, and hyperbolic systems of conservation laws.

He gave a plenary lecture at the International Congress of Mathematicians, Beijing, 2002. In 2006 he received the A. Feltrinelli Prize for Mathematics, Mechanics, and Applications from the Accademia Nazionale dei Lincei in Rome.

Besides mathematics he enjoys playing piano and flute. He lives in State College, PA, with his wife, Wen Shen, and two daughters, Luisa Mei and Maria Lan.

Response from Alberto Bressan

It is a great honor for me to receive this prize. It was also a pleasant surprise to discover that my name is now listed among the 1,631 direct descendents of Maxime Bôcher listed in the Math Genealogy Project.

When I first became interested in hyperbolic conservation laws in the 1980s, my main training had been in other fields: parabolic equations, differential inclusions, and control theory. But as a fresh Ph.D. recipient, I was intrigued by the fact that something apparently so basic as the well-posedness of the equations for gas dynamics could have remained an open problem for so many years.

The key estimates needed to establish continuous dependence of solutions were something I could figure out fairly quickly. However, it took me nearly ten years to fix details and achieve a rigorous proof in some significant case. When I attended my first hyperbolic meeting in Stony Brook in 1994, I was still an outsider. Within the research community on hyperbolic problems I found very friendly and encouraging people. One can now say that the well-posedness for hyperbolic conservation laws in one space dimension has really been a cooperative accomplishment. In particular, the ideas contributed by Tai Ping Liu and Tong Yang have been instrumental in creating the polished theory we now have.

Understanding vanishing viscosity approximations was a second major challenge. This was achieved in 2001 in joint work with Stefano Bianchini at the International School for Advanced Studies in Trieste. Bianchini was the kind of student that you can call yourself fortunate if you find one in a lifetime. He took up my research program and contributed a new and fundamental idea: using the center manifold theorem to decompose a solution as local superposition of travelling waves. He also found the energy and determination to push his way through an incredible amount of computational details, eventually completing the proof.

In the end, all this is far beyond anything I could have hoped for when I first started reading about conservation laws and the Glimm scheme in Joel Smoller's book. I am delighted to receive this prize, and I thank the American Mathematical Society for the award.

Citation

Charles Fefferman

Charles Fefferman of Princeton University is awarded the Bôcher Prize for his many fundamental contributions to different areas of analysis, including his recent work on the Whitney extension problem. His important work in this area is contained in his papers "A sharp form of Whitney's extension theorem", *Annals of Math.* 161 (2005), 509–577, and "Whitney's extension problem for C^m", *Annals of Math.* 164 (2006), 313–359.

Biographical Note

Fefferman was born in Washington, D.C., in 1949. He received his B.S. at the University of Maryland in 1966 and his Ph.D. at Princeton in 1969 under E. M. Stein. He taught at Princeton from 1969 to 1970, at the University of Chicago from 1970 to 1974, and again at Princeton since 1974. Fefferman has worked in classical Fourier analysis, partial differential equations, several complex variables, conformal geometry, quantum mechanics, fluid mechanics, and computational geometry. His honors include the Salem Prize, the Waterman Award, the Fields Medal, the Bergman Prize, and several honorary doctorates. He has served as chairman of the Princeton math department and currently chairs the board of trustees of MSRI. He is a member of the American Academy of Arts and Sciences, the National Academy of Sciences, and the American Philosophical Society.

Response from Charles Fefferman

I am grateful for my selection for the Bôcher Prize and for the recognition of my work on Whitney's problem. That question and its close relatives have fascinated me for years. In solving them, I've had crucial help in the form of beautiful, highly original ideas due to several people. Let me mention especially G. Glaeser, who invented a key geometric construction; E. Bierstone, P. Milman, and W. Pawłucki, who discovered a general form of Glaeser's construction; and Y. Brudnyi and P. Shvartsman, who conjectured a basic finiteness principle and proved it in the first hard case.

It has been a joy to collaborate with Bo'az Klartag on the effective finite version of Whitney's problem, which I hope will one day connect to applied problems. Bo'az's brilliant ideas (he insists they are obvious) have gotten us out of many an impasse.

Most of all, I am grateful that I can share the pleasure of this occasion with my wife, Julie.

Citation

Carlos Kenig

Carlos Kenig of the University of Chicago is awarded the Bôcher Prize for his important contributions to harmonic analysis, partial differential equations, and in particular to nonlinear dispersive PDE. Kenig's work has been influential in the analysis of well-posedness under minimal regularity assumptions for physical equations. Examples of this work include his seminal paper with G. Ponce and L. Vega, "Well-posedness and scattering results for generalized Korteweg-de Vries equations via the contraction principle", *Comm. Pure Appl. Math.* 46 (1993), 527–620; his remarkable work with A. Ionescu, "Global well-posedness of the Benjamin-Ono equation in low regularity spaces", *J. Amer. Math. Soc.* 20 (2007), no. 3, 753–798; and his outstanding work with F. Merle, "Global well-posedness, scattering and blow-up for the energy critical focusing nonlinear wave equation", to appear, *Acta Math.*

Biographical Note

Carlos E. Kenig was born on November 25, 1953, in Buenos Aires, Argentina, where he received his early education. He obtained his Ph.D. at the University of Chicago in 1978 under the direction of Alberto Calderón. From 1978 to 1980 he was an instructor at Princeton University, after which he held positions at the

University of Minnesota, becoming professor in 1983. In 1985 he returned to the University of Chicago, where he now is the Louis Block Distinguished Service Professor.

Kenig has been a recipient of Sloan and Guggenheim Fellowships. In 1984 he was awarded the Salem Prize. He was an invited speaker at the International Congress of Mathematicians in Berkeley (1986) and in Beijing (2002). Since 2002 he has been a Fellow of the American Academy of Arts and Sciences.

Kenig's current research interests include boundary value problems under minimal regularity conditions, degenerate diffusions, free boundary problems, inverse problems, and nonlinear dispersive equations.

Response from Carlos Kenig

It is a great honor to be a corecipient of this year's Bôcher Memorial Prize. I am grateful to the American Mathematical Society and to the selection committee for their recognition of my research. I would like to thank my family—my wife, Sarah, and my daughters, Lucy and Anna—for their love and support throughout the years. I would also like to thank my teachers, my many collaborators, and my students, all of whom have shared many insights with me. I am especially indebted to my long-time collaborators Gustavo Ponce and Luis Vega for more than twenty years (and still counting) of joint work, friendship, and shared fun.

There are many people who have influenced my mathematical career to whom I owe thanks, beginning with Alberto Calderón, my advisor, and Antoni Zygmund (both now deceased), who introduced me as a graduate student to the Calderón-Zygmund school of analysis. Eli Stein was my postdoctoral mentor, and I have greatly profited from many mathematical discussions with him and from his continued support and encouragement. The late Gene Fabes introduced me to research in partial differential equations; he was my mentor, collaborator, and dear friend. I continue to miss him. I am also particularly indebted to David Jerison and to the late Björn Dahlberg for their influence on me early on in my career. The three papers cited by the selection committee are joint works. I am very thankful to Gustavo Ponce, Luis Vega, Alex Ionescu, and Frank Merle, my coauthors in the cited papers, for their fundamental contributions to these joint works, without which these projects could not have been carried out. Finally, I would like to thank the University of Chicago, my home institution for more than twenty years, for providing me with the excellent working conditions in which my research is carried out.

The use of harmonic analysis techniques in the study of nonlinear dispersive equations was pioneered in works of I. Sigal, R. Strichartz, J. Ginibre-G. Velo, and T. Kato. In the late 1980s in joint work with Ponce and Vega, we introduced the use of the machinery of modern harmonic analysis for the study of nonlinear dispersive equations with derivatives in the nonlinearity. We showed for the first time that the initial value problem for the generalized Korteweg-de Vries equation with data in Sobolev spaces can be solved by the contraction mapping principle. In doing so, we obtained results that (for many powers in the nonlinearity) turned out to give the minimal regularity assumptions on the data for which this can be done. This was not the case with our first results for the quadratic nonlinearity in the KdV equation. Here, fundamental work of J. Bourgain (1993) expanded the functional framework for the use of the contraction mapping principle in this setting. This eventually led, in joint work with Ponce and Vega (1996), to the minimal regularity result for this case too. The resulting body of techniques (with refinements and extensions by many authors) has proved extremely powerful in many problems and settings and has attracted the attention of a large community of researchers.

In recent years I have been interested in some natural equations for which there is an exact balance between the smoothing properties of the linear part and the strength of the nonlinearity, which precludes the direct application of the techniques described before. The Benjamin-Ono equation is one such model. For this equation, examples of Molinet-Saut-Tzvetkov (2001) show that it is not possible to use the contraction mapping principle on any Sobolev space. After an important contribution by Tao (2004), who introduced a gauge transform into the problem (with a further extension by Burq-Planchon (2005) simultaneous to our work), Ionescu and I were able to obtain the conjectured global well-posedness for data of finite mass. This was achieved by combining the gauge transform of Tao with some new function spaces inspired by earlier work of Tataru in the wave map problem. These new functional structures have since proved useful for Schrödinger maps in joint works with Ionescu and with Bejenaru and Ionescu.

Lately there has been considerable interest in the study (for nonlinear dispersive and wave equations) of the long-time behavior of solutions. Issues like blow-up, global existence, and scattering have come to the forefront, especially in critical problems. The case of the energy critical, defocusing nonlinear wave equation was studied in pioneering works of many researchers in the 1980s and 1990s. (For instance M. Struwe (radial case), M. Grillakis (general case), J. Shatah-M. Struwe, H. Bahouri-J. Shatah, H. Bahouri-P. Gerard, and others). These works show that for general data in the energy space we have global existence and scattering. Corresponding results for the energy critical, defocusing nonlinear Schrödinger equations were obtained in groundbreaking works of Bourgain (radial case, 1998), Colliander-Keel-Staffilani-Takaoka-Tao (general three-dimensional case), with higher-dimensional extensions due to Ryckman-Visan and to Visan (2005). For the corresponding focusing problems, say in the case of the wave equation, H. Levine (1974) had shown that blow-up in finite time can occur. Moreover, there is a stationary solution W (which solves the corresponding elliptic problem and plays an important role in the Yamabe problem). For this solution, scattering obviously does not occur. In a series of joint works with Merle, partly inspired by the elliptic case and also by works of Merle and Martel-Merle in mass critical problems, we have developed an approach to critical dispersive problems that applies to defocusing and for the first time also to focusing problems. The approach goes through a concentrated compactness procedure that reduces matters to a rigidity theorem. For instance, for the case of the energy critical focusing nonlinear wave equation, we show that the energy of W is a threshold.

For data of energy smaller than that of W, if the critical Sobolev norm is smaller than the one of W, we have global existence and scattering; while if it is bigger, there is finite time blow-up.

There are many natural directions for future research in the areas just described. I look forward to continued research in them. I thank the selection committee once more for honoring these lines of research.

Award for Distinguished Public Service

This award was established by the AMS Council in response to a recommendation from their Committee on Science Policy. The award is presented every two years to a research mathematician who has made a distinguished contribution to the mathematics profession during the preceding five years.

Citation

Herbert Clemens

The American Mathematical Society's Distinguished Public Service Award for 2008 is awarded to Herbert Clemens for his superb research in complex algebraic geometry; for his continuing efforts in education, beginning with his days at Columbia University and his work with teachers in Chile to his teaching and collaborating with teachers in the Salt Lake City public schools and his influence in mathematics education at the national level; and, in addition, for his seminal role in the founding and continuation of the Park City/IAS Mathematics Institute.

Biographical Note

Herbert Clemens earned his Ph.D. in 1966 from the University of California, Berkeley, under the direction of Phillip A. Griffiths. He has taught at Columbia University, the University of Utah, and The Ohio State University, where he has been on the faculty since 2002. He has served as director of the NSF Regional Geometry Institute, Park City, UT, and chair of the Steering Committee for the IAS Park City Mathematics Institute. He was an invited speaker at the International Congress of Mathematicians in 1974 and in 1986. His academic honors include a Silver Medal from the Italian Mathematical Society and a Laurea de honoris causa from the Universita di Torino, among others. His research area is complex geometry.

Response from Herbert Clemens

I feel very honored to receive the 2008 Award for Distinguished Public Service from the American Mathematical Society and regret that I am unable to be present in person to receive the award. I accept the award in the name of the hundreds of AMS members engaged in professional outreach, which, though often viewed to lie at the margins of our calling as mathematicians, is vital to the long-term sustainability of our discipline, especially as pertains to the discipline's continued support by society at large.

More particularly and currently, I accept this award as recognizing the more than forty AMS members offering their services for university lecturing in Cambodia, as recognizing an equivalent number working with African mathematicians through the International Mathematical Union, and finally as recognizing the countless AMS members currently working in cooperation with the education community to improve preuniversity mathematics education in our country's schools.

Alice T. Schafer Prize for Excellence in Mathematics by an Undergraduate Woman

In 1990, the Executive Committee of the Association for Women in Mathematics (AWM) established the Alice T. Schafer Prize for Excellence in Mathematics by an Undergraduate Woman. The prize is named for former AWM president and one of its founding members, Alice T. Schafer (professor emeritus from Wellesley College), who has contributed a great deal to women in mathematics throughout her career. The criteria for selection include, but are not limited to, the quality of the nominees' performance in mathematics courses and special programs, an exhibition of real interest in mathematics, the ability to do independent work, and, if applicable, performance in mathematical competitions.

AWM is pleased to present the eighteenth annual Alice T. Schafer Prize to **Galyna Dobrovolska**, Massachusetts Institute of Technology, and to **Alison Miller**, Harvard University.

Additionally, the accomplishments of three outstanding young women, all senior mathematics majors, were recognized on Sunday, January 6, 2008. AWM was pleased to honor as the **honorable mention** recipients **Naomi Brownstein**, University of Central Florida, **Reagin Taylor McNeill**, Smith College, and **Mary Wootters**, Swarthmore College, in the Schafer Prize competition. Their citations are available from the AWM.

Citation
Galyna Dobrovolska

Galyna Dobrovolska is a senior who is an outstanding mathematics major at the Massachusetts Institute of Technology. Her coursework there has been exceptional: she has exhausted the undergraduate offerings in the mathematics department while earning the highest possible grade in every class. Dobrovolska is now moving through the graduate mathematics curriculum at MIT with the same success.

Dobrovolska has further distinguished herself through her impressive and original mathematical research. Her research is focused in algebra and would be considered broad even for a mathematician much further along in her career. Her research in algebraic combinatorics has resulted in a coauthored publication solving the Support Containment Conjecture. This paper resolves a significant open problem and as such has drawn notice from researchers in the field. Dobrovolska is currently pursuing an active research program in the theory of lower central series quotients of an associative algebra. Here she has yet again already obtained impressive theoretical results in confirming a conjecture of Feigin and Shoikhet.

In addition to winning a gold medal at the International Mathematics Olympiad, Dobrovolska won the top prize in 2006 in the Summer Program of Undergraduate Research at MIT. Her ingenious solutions to difficult problems have earned her descriptions as “a star student” and “absolutely outstanding.”

Response from Galyna Dobrovolska

I am greatly honored to be a cowinner of the Alice T. Schafer prize this year, and I would like to thank AWM for this honor.

I am thankful to Professor Pavel Etingof for doing research with me and nominating me for this prize. I would like to thank Professor Michael Artin for teaching algebra so inspirationally and for directing me to do research with Professor Etingof. I would also like to thank Professor Victor Guillemin for his support and advice to continue working on my research this summer. I want to thank Pavlo Pylyavskyy, who did research with me during the SPUR program at MIT. I am very thankful to my high school mathematics teacher, Mikhail Yakir, and his student Maksym Fedorchuk for encouraging me to apply to MIT from Ukraine. I am also grateful to Mikhail Yakir because he taught me mathematics which enabled me to go to the IMO and win a gold medal so that I could come to study at MIT. Finally, I want to thank my parents for their support and patience with me in every stage of my life.

Citation
Alison Miller

Alison Miller is a senior at Harvard University and has already published important research in number theory. She was a member of the 2004 United States International Mathematical Olympiad team and was the first-ever U.S. female to win a gold medal at the IMO. She won the Elizabeth Lowell Putnam award for outstanding performance by a woman in the Putnam Competition in 2005 and 2006.

In the summer of 2006, Miller participated in an REU at the University of Wisconsin, where she coauthored two papers on infinite product expansions of modular forms. The first of these papers, which answered a deep and difficult question originating in the Fields Medal work of Borcherds, has appeared in the *Proceedings of the American Mathematical Society*. The second paper, currently in preprint form, is expected to be very influential in this area of number theory.

In the summer of 2007, Miller wrote an independent research paper on the superpattern problem as part of an REU program at the University of Minnesota, Duluth. In this paper she developed a new technique and used it to solve a problem that had been open, and widely discussed, since 2002. Her work has been cited as “the best thing that happened to our field since November 2003.”

Response from Alison Miller

I am very honored to have been chosen as a cowinner of the AWM Schafer Prize. I wish to thank the AWM, not only for this prize, but for everything else they have done to encourage women in their mathematical endeavors.

I have been blessed with many teachers and peers from whom I have learned much, and I would like to thank the many people who have helped me get this far on my mathematical journey. First my parents, who encouraged my mathematical explorations from the beginning. I also thank my instructors and classmates at the Math Olympiad Program, who showed me so much mathematics as a high school student. I thank Joe Gallian for giving me an engaging problem to spend a summer thinking about and for his ongoing encouragement. I also thank Ken Ono for an unforgettable REU experience from which I learned a lot. I must also thank all my advisors and peers at both REUs, particularly my coauthors at the Madison REU, Carl Erickson and Aaron Pixton. As well, I thank everyone in the Harvard math department for their inspiration and support and for all I have learned. I am especially indebted to Wilfried Schmid for providing me with a solid base from which to start my mathematical explorations and to Elizabeth Denne for her encouragement and support.

Louise Hay Award for Contributions to Mathematics Education

In 1990, the Executive Committee of the Association for Women in Mathematics (AWM) established the Louise Hay Award for Contributions to Mathematics Education. The purpose of this award is to recognize outstanding achievements in any area of mathematics education, to be interpreted in the broadest possible sense. While Louise Hay was widely recognized for her contributions to mathematical logic and for her strong leadership as head of the Department of Mathematics, Statistics, and Computer Science at the University of Illinois at Chicago, her devotion to students and her lifelong commitment to nurturing the talent of young women and men secure her reputation as a consummate educator. The annual presentation of this award is intended to highlight the importance of mathematics education and to evoke the memory of all that Hay exemplified as a teacher, scholar, administrator, and human being.

Citation

Harriet S. Pollatsek

In recognition of her wide range of outstanding contributions to mathematics education, the Association for Women in Mathematics (AWM) presents the eighteenth annual Louise Hay Award to **Harriet S. Pollatsek** of the Department of Mathematics and Statistics at Mount Holyoke College.

Harriet Pollatsek received her doctorate from the University of Michigan in 1967 under the direction of Jack McLaughlin. Throughout her career she has remained an active mathematical researcher, with contributions ranging from cohomology of linear groups to difference sets in finite groups and quantum error-correcting codes, and visiting appointments at the University of Oregon, University of Cambridge, Queen Mary College of the University of London, and the University of Sussex.

What has most characterized her entire career is her love of mathematics and her energy and enthusiasm for fostering a love of it in others. She believes that everyone can benefit from learning mathematics and that the way it is taught should give students multiple opportunities to be brought into the mathematical fold.

As a faculty member at Mount Holyoke College since 1970, she has expanded the department's view of what can serve as a potential entry point into the major by helping develop 100-level "explorations" courses, which students may use as prerequisites for certain noncalculus mathematics major requirements. She was one of the designers of the Five College Calculus in Context sequence, played a large role in creating and piloting "Case Studies in Quantitative Reasoning", played a key role in a Dana Foundation effort to increase underrepresented individuals in mathematics courses, was one of the developers of a National Endowment for the Humanities-funded program to spread mathematics across the curriculum, and was critical in the design of a program to allow Mount Holyoke students to graduate with an accredited engineering major through the University of Massachusetts, Amherst.

For majors and potential majors she codeveloped an innovative mathematics laboratory course and then became a coauthor and the lead editor of a textbook for it, *Laboratories in Mathematical Experimentation*. This course has become the lynchpin of the mathematics major at Mount Holyoke. Students in the course first explore interesting mathematical questions by generating examples and discerning patterns and then state and prove theorems about them. After graduation, students often report that it was the laboratory course that most influenced their decision to major in the department and that the course made them more likely to read mathematics actively, to "mess around" with a problem, and to formulate an argument clearly. Following her philosophy of finding ways to introduce students as early as possible to the richness of mathematics, she developed a course in Lie groups that has only calculus and linear algebra as prerequisites and may be taken independently of a standard abstract algebra course. In addition, she has directed many independent students and twice directed summer research groups.

Current students laud her patience, her clarity, her availability, her thoughtfulness, and her craft. It is clear from their comments that every assignment, every test, every interaction is calculated to foster their understanding and to use their growing understanding of the material to win them over. To address the range of student backgrounds and abilities, she assigns challenge problems, a certain number of which a student must tackle with some success in order to earn an A or A–. Former students are equally enthusiastic. For instance, one wrote: "The passion that Harriet has in mathematics and in the education of mathematics has always been an inspiration to me; more importantly, her faith in what I can achieve and who I can become will always remain a strong motivation to me in the days to come." Another stated: "She was great in the classroom, is incredibly wonderful to her students, seems totally unruffled all the time, is administratively and bureaucratically very successful, and just seems to 'do it all' with class and dignity." A third referred to the way she continues to help students long after they have left the campus: "She understands and is committed to the notion that education doesn't take place just in the classroom, and it doesn't take place just in a four-year window. Education can take place in every interaction, and mentoring can continue for decades."

Harriet Pollatsek has made major contributions to mathematics education beyond the teaching of undergraduates. She has served for twenty years as an active and valued advisor for Mount Holyoke's SummerMath and SEARCH programs (for high school students) and for the SummerMath for Teachers program (for K–12 teachers). In describing her work with them, the program directors commented that she has “the ability to be optimistic and realistic at the same time” and “to make you feel important and valued while spurring you to look critically at your work,” and that she “is never too busy to find time to listen and to give her scrupulously honest and well-thought-out feedback. If she makes a suggestion, you know it is solidly grounded and never given lightly.”

At the national level, in addition to her coauthorship of mathematics textbooks and other curricular materials, she chaired the Mathematical Association of America’s Committee on the Undergraduate Program in Mathematics (CUPM) and led the writing team that produced the *CUPM Curriculum Guide 2004: Undergraduate Programs and Courses in the Mathematical Sciences*. David Bressoud, current chair of CUPM and a member of the writing team, wrote: “This was an amazingly ambitious undertaking. For the first time, CUPM was looking not just at the sequence of courses that lead to the mathematics major, but at all courses offered by departments of mathematics. . . . The goal was nothing less than a set of recommendations that departments could use to help leverage resources and reform. Harriet Pollatsek did an amazing job of shepherding this project. . . . She kept the team pulling together . . . and helped ensure a consistently high level of work. She refused to be named first author on this report, but she should have been so acknowledged.” Bressoud went on to write that the Curriculum Guide “has been a contribution to mathematics education with an importance that it is hard to overestimate.”

By the Louise Hay Award, AWM is proud to honor Harriet S. Pollatsek for her steadfast enthusiasm and commitment to the goal of leading as many students as possible to a genuine and deep appreciation for mathematics and mathematical thinking.

Response from Harriet S. Pollatsek

When I arrived at Mount Holyoke in 1970, Louise Hay’s absence there was still keenly felt. So I was aware of her accomplishments, and they were an inspiration to me. Therefore, it is with particular gratitude and delight that I receive this award bearing her name. In accepting it, I think of myself as a representative of the many mathematicians and educators who do the excellent and important work that the Hay Award recognizes.

In that spirit, I’d like to acknowledge some of the people who have shaped and inspired me as a mathematician and a teacher. My high school teacher, Kate Pankin, loved mathematics so much that her eyes would glisten when she taught. I was fortunate to learn calculus from Edwin Moise, a man ahead of his time as a top-flight researcher dedicating himself to improving the learning and teaching of mathematics. I fell in love with algebra in Donald Higman’s classes, and Jack McLaughlin showed me the teacher-mathematician as consummate craftsman and artist. I’ve learned much from the research mathematicians I’ve worked with over the years, from my *Calculus in Context* comrades, from the mathematics educators of the SummerMath programs and their teacher-collaborators, from the Mount Holyoke faculty in other disciplines with whom I’ve developed curriculum and taught, and perhaps most of all from my extraordinary colleagues in mathematics and statistics. My students at Mount Holyoke have been a constant source of inspiration; they push themselves to excel, but they always try to bring others along with them. A few years ago one even came back to teach *me*. As the Committee on the Undergraduate Program in Mathematics prepared our *CUPM Curriculum Guide 2004*, I met—and learned from—dozens and dozens of generous and wise faculty in mathematics and in the mathematics-using disciplines in addition to my fellow CUPM members, especially my cowriters.

Every one of us has a list like mine of people who have influenced our goals and helped us get closer to them. There is much more work for all of us to do, and I hope this award encourages others, as it does me. My profound thanks go to the Hay Award Selection Committee and to the AWM.

Deborah and Franklin Tepper Haimo Awards for Distinguished College or University Teaching of Mathematics

In 1991 the Mathematical Association of America instituted the Deborah and Franklin Tepper Haimo Awards for Distinguished College or University Teaching of Mathematics in order to 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. Deborah Tepper Haimo was president of the Association, 1991–1992. She died at age eighty-five in Claremont, California, on May 17, 2007.

Citation

Annalisa Crannell

Annalisa Crannell is well known for her boundless energy and enthusiasm for all things mathematical. While still a graduate student at Brown, she was chosen to design and run the first-ever mathematics segment of Brown's "A Running Start," a summer program for gifted high school students. As a newly minted faculty member at Franklin & Marshall, she immediately began including writing assignments in her mathematics courses. Her goal was to teach students how to read, write, and speak mathematics. She encapsulated her experiences in her first paper on the subject, "How to Grade 300 Math Essays and Survive to Tell the Tale."

Depending on the course, the writing projects she assigns vary. In some courses the students take a recent research paper and describe the main results, the ideas of the proofs, and how the results sit within the larger field. In abstract algebra each student adopts a group at the beginning of the semester and describes the properties and attributes that it has. In certain courses the students write grant proposals.

In 2004 she coauthored the MAA book *Writing Projects for Mathematics Courses: Crushed Clowns, Cars and Coffee to Go*. She has given a variety of talks around the country on this topic to mathematics groups, to high school and middle school teachers, and to Writing-Across-the-Curriculum programs.

Dr. Crannell also has actively pursued the connections between mathematics and art, having given talks on the subject at a variety of levels, including to high school students, at MAA meetings, and at NASA's "Take Your Daughter to Work Day." She and her colleague Marc Frantz have received over $300,000 in grants to develop materials and support workshops at Franklin & Marshall. More than 120 math and art instructors have attended since 2000.

Their book *Viewpoints: Mathematical Perspective and Fractal Geometry in Art* will be published by Princeton University Press in the near future.

At Franklin & Marshall she has supervised fifteen independent research projects, five of which have resulted in publications. Two students have won EPADEL Section student paper awards.

She continues to search for innovative ways to excite those around her about mathematics, making her eminently deserving of the Deborah and Franklin Tepper Haimo Award for Distinguished College or University Teaching of Mathematics.

Biographical Note

Annalisa Crannell earned a B.A. magna cum laude with honors in mathematics from Bryn Mawr College and a Ph.D. under Walter Craig from Brown University. Because she graduated during the turbulent job market of the early 1990s, she developed a deep appreciation for the power of volunteer groups (like the Young Mathematician's Network). She remains active in governance in both the MAA and the AMS. Since graduating, she has professed mathematics at Franklin & Marshall College, where she pursues research in topological dynamical systems, focusing particularly on classes of functions that are mildly discontinuous. She claims this works well with her family life, which includes a small conglomeration of children of the natural, step, and adopted variety.

Response from Annalisa Crannell

I've spent my last fifteen years at an institution that long ago traded in its "and" for an ampersand. As a frugal professor who hates to see a good conjunction go to waste, I've recycled the "and" and put it to good use in my own life, bringing together math and art, math and writing, not to mention research and teaching and service, as well as friends and family. I am very grateful to Franklin & Marshall College for supporting me in all my "and-eavors." And I am especially flattered to be honored with an award named for the Haimos: Deborah and Franklin.

Citation

Kenneth I. Gross

Kenneth I. Gross has had a dramatic impact on mathematics, education, and the lives of his students. Ken's teaching and mentoring have been inspirational for all levels of students, from high school students to entry-level college students, undergraduate mathematics majors and graduate students who are now accomplished mathematicians and scientists, elementary and middle school teachers, and adult learners who desire to further their education.

As a well-known researcher in group representations and harmonic analysis, Ken has published over 1,000 pages of research in refereed journals. His research was supported by the National Science Foundation for over three decades before his interests turned to the mathematics training of teachers. He has received both the Lester R. Ford Award and the Chauvenet Prize from the MAA for his mathematical writing. Serving as department head, first at the University of Wyoming and then at the University of Vermont, he worked hard to build thriving, successful mathematics programs at those institutions. Ken has also served as program director at the NSF in both the research and education directorates.

In 1993 Ken and a high school teacher cofounded a weeklong residential summer enrichment program for talented Vermont high school students, aimed especially at girls and rural Vermonters. The program expands the students' horizons for careers in mathematics or mathematically based science and technology. Counting among its graduates a U.S. Mathematical Olympiad team member, the program is still thriving fourteen years later, and it has recently been designated the "Governor's Institute in the Mathematical Sciences."

In 1999 Ken founded the Vermont Mathematics Initiative (VMI), a statewide master's degree-granting program that trains elementary and middle school teachers to serve as mathematics leaders in their schools and districts. To date, over two hundred teachers from nearly 90 percent of the school districts in Vermont have participated in the program. Other programs modeled on VMI and utilizing VMI-designed materials have sprung up in Arkansas, Massachusetts, Nebraska, and New Mexico. Recently, the Intel Corporation tapped Ken to develop a program based on VMI that Intel plans to scale-up nationally.

In 2003 Ken was recruited by Lesley University, a prominent teacher education institution in Massachusetts, to lead the development of its mathematics programs for teachers. During Ken's two years there, he founded the Lesley Center for Mathematics Achievement, which reaches dozens of school districts in Massachusetts with courses that Ken initiated. Lesley doubled the number of graduate mathematics courses and instituted three new graduate degree programs for elementary and middle school teachers.

Ken is currently professor of mathematics and education at the University of Vermont, where he has received that institution's highest awards for both research and teaching. He is most deserving of the MAA's Deborah and Franklin Tepper Haimo Award.

Biographical Note

Kenneth I. Gross received his A.B. from Brandeis University with majors in physics and mathematics, his M.S. in mathematics from Brandeis, and his doctorate in mathematics from Washington University (St. Louis). In a career spanning five decades, he has conducted fundamental mathematics research, enjoyed teaching mathematics to all levels of students, and been a successful academic administrator. Ken has held faculty positions at Tulane, Dartmouth, North Carolina (Chapel Hill), Wyoming, Lesley University, and (since 1987) the University of Vermont, and he has been visiting professor at a number of institutions at home and abroad. As a mathematician he is drawn to challenging problems in noncommutative harmonic analysis. As an educator his fundamental goal is to enrich the lives of all students, from the most math-phobic student to the most mathematically gifted student working on a doctorate, and he takes profound pleasure in seeing all succeed.

Response from Kenneth I. Gross

I am deeply honored to receive this prestigious award but also saddened that my friend Deborah Haimo is no longer with us. To be an educator is itself an honor, for to live on in the hearts and minds of the students whose lives we have touched is a form of immortality. I have had wonderful students, many of whom have become my lifelong friends. As well, I have had wonderful teachers to guide my own career. I was especially inspired by my mother, who had no college education but prized education and conveyed by example the importance of a strong work ethic; my older brother, Herb, a nationally distinguished educator from whom I absorbed the importance of human values in teaching; and my Ph.D. advisor, Ray Kunze, without whose encouragement I never would have become a mathematician. I have been truly blessed, as I cannot imagine a more satisfying career.

Citation

James Morrow

James (Jim) Allen Morrow has had a fundamental impact at the University of Washington and throughout the Pacific Northwest. He has directed a Research Experiences for Undergraduates site there since 1988, focusing on problems related to inverse problems in tomography. Eight of its participants have received NSF graduate fellowships. Many of them have gone on to substantial success in this and other fields of mathematics. Students have presented their work at a variety of meetings and published their results in a variety of refereed research journals.

For the past six years Jim has also been preparing students for the Mathematical Contest in Modeling (MCM). His students have an enviable record of success, with seven teams that he has coached receiving the Outstanding Winner Award, and five of those seven winning additional awards from the MAA, INFORMS, and SIAM.

Since 1994 Jim has organized a Mathday at UW, bringing 1,200 high schoolers from the Northwest to the campus. It is an opportunity to showcase the relevance of mathematics to a variety of disciplines.

In addition, he is the codirector of the Summer Institute for Mathematics at the University of Washington. This program brings twenty-four high schoolers from the U.S. and Canada to campus for six weeks in the summer. They take courses in the mornings and have lectures, activities, and field trips in the afternoons, with speakers from academia and industry.

In 2003 Jim received the Distinguished Teaching Award at the University of Washington. In 2005 Jim won the Education Prize from the Pacific Institute for the Mathematical Sciences at the University of British Columbia. In addition to making time for all of these initiatives, Jim is also a highly successful researcher who has published results of lasting influence. He is most deserving of the Haimo Distinguished Teaching Award.

Biographical Note

James Morrow grew up in Arkansas and Texas. He was inspired to be a mathematician by a high school teacher, Frances Freese. He has a B.S. from the California Institute of Technology and a Ph.D. from Stanford. His thesis was written under the direction of Kunihiko Kodaira. He has held positions at Berkeley and Rice. He has been at the University of Washington since 1969. He is the coauthor of *Complex Manifolds* with Kunihiko Kodaira and *Inverse Problems for Electrical Networks* with Ed Curtis. Following a suggestion of Hugo Rossi, he has directed an REU program since 1988. He is currently Kauffman-Rebassoo Professor of Mathematics, funded by Vaho Rebassoo, one of his first Ph.D. students, and George Kauffman, a fan of Mathday.

He has cycled across the United States and taken extended cycle trips in Montana, Oregon, and Washington. He has completed twelve RAMRODs (Ride Around Mt. Rainier in One Day) and thirteen marathons.

Response from James Morrow

This award should go to “Jim Morrow’s students.” Any recognition that I have received is due to the performance of my excellent students. I think my students get better every year. I am very lucky to have been able to encourage them in their successes, and I feel more like a cheerleader than a coach. Most good students just need a little encouragement and a chance to succeed. It is a pleasure for me to follow their careers and be part of their lives.

The faculty and staff at the University of Washington also share this award. There is no better place to be, and I am grateful to my department for all of its support. I see many people who are equally deserving and hope that they too will eventually be recognized. It is fun to be part of this joint activity in the subject I love, mathematics.

Euler Book Prize

The Euler Book Prize is given to the author or authors 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. They shall be judged on clarity of exposition and the degree to which they have had or show promise of having a positive impact on the public's view of mathematics in the United States and Canada. A textbook, though not normally eligible for this award, could be recognized if the Committee on the Euler Book Prize is convinced that it is innovative, distinctive, well written, and very likely to have a long-standing impact on mathematics.

The prize was established in 2005 and will be given every year at a national meeting of the Association, beginning in 2007, the 300th anniversary of the birth of Leonhard Euler. This award also honors Virginia and Paul Halmos, whose generosity made the award possible.

Citation

Benjamin H. Yandell

The Honors Class. Hilbert's Problems and Their Solvers, A K Peters, Natick, MA, 2002.

Ben Yandell began writing this book in 1992 when he asked himself, "Whatever happened to Hilbert's Problems?" *The Honors Class* is his answer to that question, and it tells more about modern mathematics than one would have thought possible in a coherent narrative. With amazing persistence, Yandell located, interviewed, or corresponded with scores of Hilbert's mathematical descendents to create a full and faithful picture of twentieth-century mathematical life.

As its subtitle states, *The Honors Class* is about Hilbert's problems and their solvers. Each chapter contains biographies of the main contributors to the problem under discussion, skillfully interwoven with the mathematics. It is possible to read the book for the biographies alone, as they are beautifully written and laced with anecdotes of all kinds—spicy, funny, surprising, and poignant. The biographies have more than entertainment value, however. They genuinely add to our understanding of the Hilbert problems by tracing the development of ideas as they spread from person to person and country to country.

Even when discussing well-known mathematicians such as Hilbert, Gödel, and Kolmogorov, Yandell manages to say something fresh and to correct some oft-repeated errors. The book is a monumental labor of love, yet breathtakingly readable and inspiring. It is written at a level that bright mathematics students can understand, but it will also widen the horizons of professional mathematicians, since almost no one is as familiar with as many fields as Hilbert was. *The Honors Class* should be in every mathematician's library.

Biographical Note

Two years after publication of *The Honors Class*, Ben Yandell died at the age of fifty-three in Pasadena, California. Eleven years earlier he had received word he had multiple sclerosis, but this disease apparently did not contribute to his early death. After his undergraduate education at Occidental College and Stanford University, he chose not to pursue doctoral studies in mathematics but instead wrote poetry and became a television repairman. He also sat in on graduate courses in physics at Caltech. *The Honors Class* was inspired by his having read Constance Reid's *Hilbert*. At the time of his death he was working on two books, a biography of John von Neumann and a book on solitons that he was encouraged to write by Sir Michael Atiyah. He is survived by his daughter, Kate Louise, now nine years old, and his wife, Janet Nippell, with whom he coauthored his first book, *Mostly on Foot: A Year in L.A.*

Chauvenet Prize

The Chauvenet Prize is awarded to the author of an outstanding expository article on a mathematical topic by a member of the Association. First awarded in 1925, the prize is named for William Chauvenet, a professor of mathematics at the United States Naval Academy. It was established through a gift in 1925 from J. L. Coolidge, then MAA president. Winners of the Chauvenet Prize are among the most distinguished of mathematical expositors.

Citation

Andrew Granville

"It is easy to determine whether a given integer is prime," *Bulletin of the American Mathematical Society (N.S.)* 42 (2005), 3–38.

This article is fascinating, readable, and understandable, with lots of proofs. The entire abstract is a totally relevant quote from Gauss! The paper includes the statement, AND PROOF, of the amazing result by Agrawal, an Indian computer scientist, and his two undergraduates, Kayal and Saxena, giving a "polynomial time deterministic" test for determining if integers are primes. The AKS algorithm (for their last names) was announced in August 2002. Efficient algorithms were already in use, and it is suspected that some of them work in polynomial time. The AKS algorithm is the first algorithm proved to work in polynomial time, and this result "has the great advantage that it is straightforward to develop into a fast algorithm for proving the primality of large primes."

The paper includes interesting tidbits like the passage from Oliver Sacks's *The Man Who Mistook His Wife for a Hat* about a pair of severely autistic twins who could determine whether 20-digit numbers are prime, and we'll never know how because they were eventually separated and "socialized." But we mislead: The paper is full of significant information, including discussions of Carmichael numbers, random polynomial time algorithms, probabilistic (almost) proofs, and much more. In one section, the author quickly and clearly explains the important connection between factoring integers and cryptography, and mentions the famous RSA cryptosystem. Section 7, titled "Stop the Press," includes the fact that Lenstra and Pomerance have modified the AKS algorithm so that it works in $(\log n)^6$ polynomial time.

Biographical Note

Andrew Granville is the Canadian Research Chair in number theory at the Université de Montréal. His research focus is on any area to do with understanding the distribution of primes. Encouraged by the writings of two of his mentors, Paulo Ribenboim and Carl Pomerance, he has long been interested in communicating these ideas to a broad audience, and this has previously been recognized by the MAA's 1995 Hasse Prize, as well as its 2007 Lester R. Ford Award.

Dr. Granville was a plenary speaker at the Annual Joint Meetings of 1996 and 2002, and this article evolved from his presentation at the Current Events special session of the 2004 Joint Mathematics Meetings. Dr. Granville helped create the questions for the MAA's Putnam exam from 1999 to 2002, has served on the scientific advisory panels of MSRI and of the Fields Institute, and has served on prize selection committees, such as for the 2005 Cole Prize and the 2008 Doob Prize.

Response from Andrew Granville

When David Eisenbud asked me to present the exciting new polynomial time primality testing algorithm of Agrawal, Kayal, and Saxena at the 2004 AMS Current Events special session in a way that would be accessible to undergraduates at the meeting yet interesting to seasoned researchers, I could not have guessed the journey this would take me on. My goal was to integrate ideas from modern computational number theory/cryptography into an analytic number theory discussion while at the same time keeping everything accessible to a keen but inexperienced reader. What started slowly began to "flow" thanks to help I received, both technical and expository—running drafts past students at various universities allowed me to identify passages that needed reworking. A book by Ribenboim and an article by Bombieri provided many ideas as to how to present several of the technically difficult ideas in an accessible way, and a website of Bernstein provided lots of background information. Pomerance, Agrawal, and others helped me find new, more accessible proofs to some of the more challenging aspects of the material. A big thanks for all of this help!

American Mathematical Society
Mathematical Association of America
Society for Industrial and Applied Mathematics

Frank and Brennie Morgan Prize for Outstanding Research in Mathematics by an Undergraduate Student

The Frank and Brennie Morgan Prize for Research in Mathematics by an Undergraduate Student recognizes and encourages outstanding mathematical research by undergraduate students. It was endowed by Mrs. Frank Morgan of Allentown, Pennsylvania.

Citation

Nathan Kaplan

Nathan Kaplan has been named the recipient of the 2008 Morgan Prize for Outstanding Research by an Undergraduate. He graduated in 2007 from Princeton University with high honors. He also received the mathematics department's Peter Greenberg Prize, which honors outstanding mathematical accomplishments.

This award is based principally on four impressive papers in algebraic number theory, two of them individual and two with other authors. (Coauthors of the joint papers were careful to highlight Kaplan's substantial contributions.) At least three of these papers have been accepted for publication in such venues as the *Journal of Number Theory*, the *Journal of Algebra and Its Applications*, and *Acta Arithmetica*. Concerning Nathan's paper "Flat cyclotomic polynomials of order three," the *Journal of Number Theory* wrote that the work "contains … rather definitive results substantially advancing our understanding of cyclotomic polynomials of order three." Another recommender observed that this and related work of Kaplan demonstrates remarkable creativity [and] technical facility … [and] will provide researchers new tools."

Kaplan participated in three summer REU programs (at Trinity University, Williams College, and the University of Minnesota-Duluth) during his undergraduate career and produced publishable, professional-level work at all three. One of his supervisors described him as the most outstanding undergraduate with whom he had worked. Another supervisor described Kaplan as an extraordinary student—brilliant, friendly, outgoing, polite, and fun to work with. All of his recommenders, and this committee, fully expect Kaplan to become a very successful research mathematician.

Biographical Note

Nathan Kaplan was raised in Brooklyn, New York, and began taking math classes at Columbia University while in high school. He graduated in June 2007 with a degree in mathematics from Princeton University and is currently at Cambridge University doing Part III of the Mathematical Tripos.

His first research experience was in the summer of 2004 at the Trinity University REU program studying numerical monoids with Scott Chapman. The following summer he worked in the algebraic number theory group at the Williams College SMALL program under the direction of Allison Pacelli. In 2006 Nathan attended Joe Gallian's REU at the University of Minnesota-Duluth and studied cyclotomic polynomials. This past summer he returned to the Trinity REU and worked as a graduate assistant. He also participated in independent research at Princeton with Ramin Takloo-Bighash, who has advised him since his first week on campus.

Next fall he will begin the mathematics Ph.D. program at Harvard University on a National Science Foundation Graduate Fellowship. He plans to study algebraic number theory. He is enthusiastic about teaching and has been active in tutoring since high school. Outside of math he is a dedicated New York Mets fan, enjoys theater and film, and once bowled a 162.

Response from Nathan Kaplan

I am very honored to be selected for the 2008 Morgan Prize. I would like to thank Mrs. Frank Morgan for endowing the award and the AMS, MAA, and SIAM for sponsoring it. I am very grateful to all of my advisers who have taught me what research is all about: Ramin Takloo-Bighash and Manjul Bhargava at Princeton, Scott Chapman at Trinity University, Allison Pacelli at Williams, and Joe Gallian at the University of Minnesota-Duluth. I owe a lot of thanks to the other students I worked with at summer REU programs and also to the students in my problem set groups at Princeton for helping me get the most out of my academic experiences. I would also like to thank my friends in Princeton, NYC, and elsewhere for giving me something to do when I needed a mathematical break. Most importantly, I must thank my parents for their love and support and for giving me so many opportunities to succeed.

Joint Policy Board for Mathematics Communications Award

The Joint Policy Board for Mathematics (JPBM) established its Communications Award in 1988 to reward and encourage journalists and mathematicians who, on a sustained basis, bring mathematical ideas and information to nonmathematical audiences. The award recognizes a significant contribution or accumulated contributions to the public understanding of mathematics, and it is meant to reward lifetime achievement. JPBM represents the American Mathematical Society, the American Statistical Association, the Mathematical Association of America, and the Society for Industrial and Applied Mathematics.

Citation

Carl Bialik

The 2008 JPBM Communications Award is awarded to Carl Bialik, the *Wall Street Journal*'s Numbers Guy, for increasing the public's understanding of mathematical concepts.

In his regular columns and blogs, Carl Bialik exposes the misuse of numbers and statistics throughout society and in applications ranging over every part of life, from economics and politics to sports and medicine. His writing does more than document the misuse, however, because he gently introduces sound mathematical reasoning in everything he writes. He shows how to use numbers and mathematics in a way that illustrates sound principles of scientific inquiry, paying careful attention to original sources and using professional mathematical scientists to validate his work.

Carl Bialik exemplifies the best traditions of scientific journalism, bringing mathematics and mathematical thinking to a large readership. The breadth, volume, and quality of his writing are all spectacular.

Biographical Note

Carl Bialik was born and raised in New York City, where his sister taught him early math lessons, his father crunched baseball numbers with him, and his mother trained him in statistics. He attended the Bronx High School of Science, where he edited the *Math Bulletin*, was a member of the school and city math team, and was a finalist in the 56th Science Talent Search for his biophysics research at Mount Sinai Hospital. He majored in math and physics at Yale, where he served as executive editor of the weekly *Herald* newspaper.

Bialik has written for the *Wall Street Journal* Online since early 2002. He became a technology reporter the following year. He began writing the weekly online Numbers Guy column in 2005. In 2006, Bialik won second place in the online category of the National Society of Newspaper Columnists contest. In March 2007, the column began running every other week on the Marketplace page of the print *Journal*, complemented by a blog updated each weekday. Bialik has also coauthored the Online *Journal*'s Daily Fix sports column since 2002. Outside the *Journal*, he is cofounder of the online *Gelf Magazine* and hosts the magazine's Varsity Letters sports reading series in New York.

Response from Carl Bialik

I'm immensely honored to receive this award, particularly because of my admiration for all the prior recipients—and my particular appreciation for several who have helped me frequently with my column. Many other members of the AMS and ASA also have provided indispensable help as I try to decipher tricky numbers and explain them to readers, a daily challenge that is always enjoyable.

I encourage your organizations to continue to engage with journalists, as you have done so graciously with me. Numbers are a popular tool to obfuscate and mislead. Too often the press falls prey to faulty figures. We would like to do a better job of writing about numbers and deciding which numbers don't deserve press. And we need your help to do so.

My column is, I hope, a step in the right direction. Its existence and success are a credit to Bill Grueskin, the editor who conceived of it and handed me this fun assignment, and to Jason Anders, who has ably edited and improved the column since its inception.

Frank Nelson Cole Prize in Number Theory

This prize was founded in honor of Frank Nelson Cole on the occasion of his retirement as secretary of the AMS after twenty-five years of service and as editor-in-chief of the *Bulletin* for twenty-one years. The endowment was made by Cole, contributions from Society members, and his son, Charles A. Cole. This prize is awarded every three years.

Citation

Manjul Bhargava

Professor Manjul Bhargava of Princeton University is cited for his revolutionary work on higher composition laws. His series of articles on this subject introduced completely new and unexpected ideas into a subject that began with work of Carl Friedrich Gauss in 1801.

At that time, Gauss anticipated the modern theory of abelian groups by constructing a law of composition on the set of equivalence classes of binary quadratic forms of given discriminant. By the end of the nineteenth century, the fundamental concept of an abstract group allowed one to view the system of equivalence classes of binary quadratic forms of given discriminant as the "ideal class group" of a quadratic field. Once this recasting of Gauss's work became established, Gauss's "law of composition" became something of a curiosity—evidence of how a brilliant mathematician can uncover a fundamental phenomenon even without the right tools to think about it.

Bhargava's original and surprising contribution is the discovery of laws of composition on forms of higher degree. His techniques and insights into this question are dazzling; even in the case considered by Gauss, they lead to a new and clearer presentation of that theory. If Bhargava had stopped with this discovery, his work would already be quite remarkable. But Bhargava has gone on to use his composition laws to solve a new case of one of the fundamental questions of number theory, that of asymptotic enumeration of number fields of given degree as the discriminant grows. The question is trivial for degree 1, and the quadratic case was solved by Gauss's work. Davenport and Heilbronn treated the cubic case in 1971. Bhargava used his new composition laws to solve the degree 4 case, brilliantly overcoming very serious analytic problems that had completely blocked all previous work on the problem.

Biographical Note

Manjul Bhargava was born in Hamilton, Ontario, Canada, but spent most of his early years in Long Island, New York. He received his A.B. in mathematics summa cum laude from Harvard University in 1996 and his Ph.D. from Princeton University in 2001. After holding visiting positions at MSRI, the Institute for Advanced Study, and Harvard University, he joined the faculty at Princeton University as professor of mathematics in 2003. He was also named the Clay Mathematics Institute's first Five-Year Long-Term Prize Fellow in 2001. An accomplished tabla player whose research interests span number theory, combinatorics, and representation theory, Professor Bhargava has received numerous awards and honors, including the Hoopes Prize for Excellence in Scholarly Work and Research from Harvard University (1996), the AMS-MAA-SIAM Frank and Brennie Morgan Prize for Outstanding Undergraduate Research in Mathematics (1997), the MAA Merten M. Hasse Prize for Exposition (2003), the Packard Foundation Fellowship in Science and Engineering (2004), the Clay Research Award (2005), the SASTRA Ramanujan Prize (2005), and the Blumenthal Award for the Advancement of Research in Pure Mathematics (2005). He has been a three-time recipient of the Derek Bok Award for Excellence in Teaching and was named one of *Popular Science* magazine's "Brilliant 10" in 2002. Professor Bhargava was an Invited Speaker at the International Congress of Mathematicians in Madrid in 2006 and has given numerous other invited addresses, colloquia, seminars, and public lectures at colleges and universities across North America and Europe.

Response from Manjul Bhargava

I am very grateful and honored to be the recipient of the 2008 Cole Prize. During the past few years I have had the good fortune of interacting with many wonderful mathematicians (both faculty and students) whose friendship and wisdom have been a constant source of inspiration for me. I would like to thank them all. In particular, I wish to express my deep gratitude to my graduate school teachers, Andrew Wiles, Peter Sarnak, and John Conway; and my undergraduate teachers and mentors, Dick Gross, Barry Mazur, Persi Diaconis, Joe Gallian, and Dave Cargo, from whom I have learned (and continue to learn!) so much and by whom I have been constantly inspired. I am also extremely grateful to Hendrik Lenstra and Don Zagier for their kindness and generosity and for always being available to discuss interesting mathematics!

I thank the Department of Mathematics at Princeton University for providing me with a wonderful work environment and the Clay Mathematics Institute and the Packard Foundation for funding my work.

The papers cited above build on ideas that go way back, starting with the mathematical works of Brahmagupta, Gauss, Dirichlet, Eisenstein, and Dedekind and leading up to the works of modern mathematicians such as Delone-Faddeev, Davenport-Heilbronn, Sato-Kimura, Wright-Yukie, and Gan-Gross-Savin. I gratefully acknowledge my indebtedness to all these mathematicians!

Perhaps I should also take this opportunity to thank here Erno Rubik for making his cube!

Finally, I thank my family for all their love and support.

Joseph L. Doob Prize

This prize was established in 2003 to recognize a single, relatively recent, outstanding research book that makes a seminal contribution to the research literature, reflects the highest standards of research exposition, and promises to have a deep and long-term impact in its area. The book must have been published within the six calendar years preceding the year in which it is nominated. Books may be nominated by members of the Society, by members of the selection committee, by members of AMS editorial committees, or by publishers.

The prize (originally called the Book Prize) was endowed in 2005 by Paul and Virginia Halmos and renamed in honor of Joseph L. Doob. Paul Halmos (1916–2006) was Doob's first Ph.D. student. Doob received his Ph.D. from Harvard in 1932 and three years later joined the faculty at the University of Illinois, where he remained until his retirement in 1978. He worked in probability theory and measure theory, served as AMS president 1963–1964, and received the AMS Steele Prize in 1984 "for his fundamental work in establishing probability as a branch of mathematics." Doob passed away on June 7, 2004, at the age of ninety-four.

Citation

Enrico Bombieri and Walter Gubler

Heights in Diophantine Geometry
by Enrico Bombieri and Walter Gubler
(Cambridge University Press, 2006)

The book is a research monograph on all aspects of Diophantine geometry, both from the perspective of arithmetic geometry and of transcendental number theory. The key emphasis is on the (delicate) theory of heights, which is developed with extraordinary precision and elegance.

The choice of subjects is broad and gives the sense of a powerful body of ideas. The great results of arithmetic geometry—the theorems of Mordell-Weil, Roth, Siegel and Faltings—are all proved with a consistent, remarkably accessible point of view. The book also develops the extraordinary work of Zhang and others on the Bogomolov conjecture, puts forward an elegant approach to Hilbert irreducibility, and includes a detailed discussion of the Nevanlinna-Vojta theory. There is a lovely exposition of the important theory of unit equations and a most brilliant discussion of the Subspace Theorem of Schmidt and Schlickewei, as well as the possibilities afforded by the abc-conjecture and further developments along these lines.

The book is self-contained yet surprisingly accessible given the depth of the material. Links between classical Diophantine arithmetic and modern arithmetic geometry are emphasized throughout the text in an appealing way. There are well-constructed appendices on key technical issues such as basic algebraic geometry, algebraic ramification theory, and the geometry of numbers (a subject which is going through a revival at the moment).

One gets the sense that every lemma, every theorem, every remark has been carefully considered, and every proof has been thought through in every detail. There are well-chosen, illuminating examples throughout every chapter. The book is a masterpiece in terms of its original approach, its unrivalled comprehensiveness, and the sheer elegance of the exposition. There can be no doubt that this book will become the basis for the future development of this central subject of modern mathematics.

Biographical Note

Enrico Bombieri

Enrico Bombieri was born in Milan, Italy, in 1940. He started studying mathematics, and in particular number theory, at an early age with Giovanni Ricci. He graduated from the University of Milan in 1963 and became assistant professor there immediately after. He spent the next year in Cambridge, England, working with Davenport and Swinnerton-Dyer, studying geometry over finite fields and the distribution of prime numbers. He became a full professor in 1965, with his first appointment at the University of Cagliari and in 1966 at the University of Pisa. In 1975 he moved to the Scuola Normale Superiore in Pisa and in 1977 joined the School of Mathematics of the Institute for Advanced Study in Princeton, NJ, as a full professor. He became a U.S. citizen in 1994.

He was elected a member of the National Academy of Science USA in 1965 and of the Accademia Nazionale dei Lincei, Italy, in 1976; fellow of the American Academy of Arts and Sciences in 1979; foreign member of the Institut de France, Académie des Sciences in 1984; foreign member of the Royal Swedish Academy of Sciences in 1982; honorary member of the London Mathematical Society in 1977; Chevalier de l'Ordre des Palmes Académiques, France, in 1993; Doctor Honoris Causa, University of Pisa, in 2001; and Cavaliere di Gran Croce al Merito della Repubblica, Italy, in 2002. He received the Fields Medal at the ICM-1974 in Vancouver, the Feltrinelli Prize in 1976, and the Balzan Prize in 1980.

His first studies in number theory were with Giovanni Ricci and Davenport, in algebraic geometry with Swinnerton-Dyer and Aldo Andreotti, and during his tenure in Pisa was initiated into the theory of partial differential equations and minimal surfaces by Guido Stampacchia and Ennio De Giorgi.

His main interests in number theory are prime number theory, zeta functions, Diophantine geometry, and Diophantine approximation; in analysis, complex function theory in one and several variables, minimal surfaces, and geometric measure theory; in algebraic geometry, geometry over finite fields, arithmetic geometry, and classification problems.

He is the author of two short monographs, a comprehensive monograph (with Walter Gubler) on the theory of heights in Diophantine geometry, and over 160 research papers published in leading mathematical journals. After mathematics his main activities are painting and drawing.

Response from Enrico Bombieri

It is indeed a great surprise for me, and certainly a great honor, to receive the Doob Prize for my book with Walter Gubler on the theory of heights in Diophantine geometry. The origin of this book goes back to 1992 after I found a simplification of Vojta's landmark new proof of the Mordell conjecture. I had been invited to give a series of lectures to graduate students and young researchers in Pisa, and I thought it appropriate to give a short course on Diophantine geometry, culminating with the proof of the Mordell conjecture. This course was well received, so when a little later I was asked by Wüstholz to give a Nachdiplom course to students at the ETH in Zürich, we quickly agreed that the same topic would be fine. There was a little condition, namely, to develop all the material from scratch. Walter Gubler, who was then just finishing his Ph.D. thesis with Professor Wüstholz, was given the job of taking notes in the best old-fashioned European style.

To my great surprise, Walter's notes were absolutely superb: well organized, clearly written, amplified in places, and correcting the inaccuracies and mistakes I had made during my lectures. They formed an excellent basis for an introductory course, so it was decided to expand them to book form. Walter collaborated enthusiastically in the writing, and after a short while when the rough notes expanded well beyond the initial text in order to include more and more foundational material as well as complements to the main theory, he became a coauthor. The unifying theme would be the theory of heights and its application to Diophantine geometry on commutative groups.

Without Walter, this book could not have been written.

It was a long task to write up and organize the material, and in the meantime the subject itself kept growing and we had to play a catch-up game. So it took almost twelve years to write and revise the book. It was not the first one on the subject, and there were already several other excellent monographs where one could learn the subject. So why one more book? For me, writing this book was like preparing carefully a series of lectures to bright students, and I received a lot of satisfaction doing it. Now it is time for it to go out and establish its little place in the mathematical world, with the hope that it will be well received and prove itself to be useful to young mathematicians entering the beautiful subject of Diophantine geometry and arithmetic geometry.

Biographical Note

Walter Gubler

Walter Gubler was born October 30, 1965, in Olten, Switzerland. He received his diploma in mathematics at the ETH Zürich in 1989. At the same place, he earned his Ph.D. in 1992 under Gisbert Wüstholz. For his thesis, "Heights of subvarieties", he won the silver medal of the ETH. From 1992 to 1993 he visited the Institute for Advanced Study in Princeton. Then he held postdoc positions at the ETH Zürich and at the Humboldt University in Berlin. In 2003 Walter Gubler received the venia legendi at the ETH for his habilitation thesis. From 2003 to 2007 he was a lecturer at the University of Dortmund. Currently he is BMS substitute professor at the Humboldt University in Berlin.

Response from Walter Gubler

It is an honour for me to receive the Doob Prize 2008 together with my coauthor, Enrico Bombieri. Our book project started with a lecture by Enrico at the ETH Zürich. I had not anticipated that we would have to invest more than ten years of hard work to finish this book. On the one hand, new results came from research, and on the other hand, a lot of efforts were necessary to make the book self-contained. From my point of view, the time was well invested, as I learned so much about the subject and it was great fun to work with Enrico. I wish to thank him for giving me the opportunity to collaborate. I am very gratified to receive this prize for all the effort. Thank you.

Leroy P. Steele Prize for Lifetime Achievement

The Leroy P. Steele Prizes were established in 1970 in honor of George David Birkhoff, William Fogg Osgood, and William Caspar Graustein and are endowed under the terms of a bequest from Leroy P. Steele. Prizes are awarded in up to three categories. The following citation describes the award for Lifetime Achievement.

Citation

George Lusztig

The work of George Lusztig has entirely reshaped representation theory and in the process changed much of mathematics.

Here is how representation theory looked before Lusztig entered the field in 1973. A central goal of the subject is to describe the irreducible representations of a group. The case of reductive groups over locally compact fields is classically one of the most difficult and important parts. There were three more or less separate subjects, corresponding to groups over $\mathbb{R}$ (Lie groups), $\mathbb{Q}_p$ (p-adic groups), and finite fields (finite Chevalley groups).

Lusztig's first great contribution was to the representation theory of groups over finite fields. In a 1974 book he showed how to construct "standard" representations—the building blocks of the theory—in the case of general linear groups. Then, working with Deligne, he defined standard representations for all finite Chevalley groups. This was mathematics that had been studied for nearly a hundred years; Lusztig and Deligne did more in one paper than everything that had gone before.

With the standard representations in hand (in the finite field case), Lusztig turned to describing irreducible representations. The first step is simply to get a list of irreducible representations. This he did almost immediately for the "classical groups", like the orthogonal groups over a finite field. The general case required deep new ideas about connections among three topics: irreducible representations of reductive groups, the representations of the Weyl group, and the geometry of the unipotent cone. Although some key results were contributed by other (great!) mathematicians like T. Springer, the deepest new ideas about these connections came from Lusztig, sometimes in work with Kazhdan.

Lusztig's results allowed him to translate the problem of describing irreducible representations of a finite Chevalley group into a problem about the Weyl group. This allowed results about the symmetric group (like the Robinson-Schensted algorithm and the character theory of Frobenius and Schur) to be translated into descriptions of the irreducible representations of finite classical groups. For the exceptional groups, Lusztig was asking an entirely new family of questions about the Weyl groups, and considerable insight was needed to arrive at complete answers, but eventually he did so.

Lusztig's new questions about Weyl groups originate in his 1979 paper with Kazhdan. The little that was known about irreducible representations first becomes badly behaved in some very specific examples in $SL(4,\mathbb{C})$. Kazhdan and Lusztig noticed that their new questions about Weyl groups first had nontrivial answers in exactly these same examples (for the symmetric group on four letters). In an incredible leap of imagination, they conjectured a complete and detailed description of singular irreducible representations (for reductive groups over the complex numbers) in terms of their new ideas about Weyl groups. This (in its earliest incarnation) is the Kazhdan-Lusztig conjecture. The first half of the proof was given by Kazhdan and Lusztig themselves, and the second half by Beilinson-Bernstein and Brylinski-Kashiwara independently.

The structure of the proof is now a paradigm for representation theory: use combinatorics on a Weyl group to calculate some geometric invariants, relate the geometry to representation theory, and draw conclusions about irreducible representations. Lusztig has used this paradigm in an unbelievably wide variety of settings. One striking case is that of groups over p-adic fields. In that setting Langlands formulated a conjectural parametrization of irreducible representations around 1970. Deligne refined this conjecture substantially, and many more mathematicians have worked on it. Lusztig (jointly with Kazhdan) showed how to prove the Deligne-Langlands conjecture in an enormous family of new cases. This work has given new direction to the representation theory of p-adic groups.

There is much more to say: about Lusztig's work on quantum groups, on modular representation theory, and on affine Hecke algebras, for instance. His work has touched widely separated parts of mathematics, reshaping them and knitting them together. He has built new bridges to combinatorics and algebraic geometry, solving classical problems in those disciplines and creating exciting new ones. This is a remarkable career and as exciting to watch today as it was at the beginning more than thirty years ago.

Biographical Note

George Lusztig was born in Timisoara, Romania, in 1946. After graduating from the University of Bucharest in 1968, he was an assistant at the University of Timisoara and then a member of the Institute for Advanced Study, where he studied with Michael Atiyah. During his second year at IAS he was also a graduate student at Princeton University and received a Ph.D. degree (1971) for work on Novikov's higher signature and families of elliptic operators. He then moved to the University of Warwick, U.K., becoming a professor in 1974. For the last thirty years he has been a professor at MIT. He has been a frequent visitor to IHES (Institut des Hautes Études Scientifiques) and spent the academic year 1985–86 at the University of Rome. Lusztig received the Berwick Prize (London Mathematical Society, 1977), the Cole Prize in Algebra (American Mathematical

Society, 1985), and the Brouwer Medal (Dutch Mathematical Society, 1999). He is a fellow of the Royal Society of London, a fellow of the American Academy of Arts and Sciences, and a member of the National Academy of Sciences.

Response from George Lusztig

When writing a response it is very difficult to say something that has not been said before. Therefore, I thought that I might give some quotes from responses of previous Steele Prize recipients which very accurately describe my sentiments.

"What a pleasant surprise!" (Y. Katznelson, 2002). "I feel honored and pleased to receive the Steele prize—with a small nuance, that it is awarded for work done up to now" (D. Sullivan, 2006). "I always thought this prize was for an old person, certainly someone older than I, and so it was a surprise to me, if a pleasant one, to learn that I was chosen a recipient" (G. Shimura, 1996). "But if ideas tumble out in such a profusion, then why aren't they here now when I need them to write this little acceptance?" (J.H. Conway, 2000).

Now, I thank the Steele Prize Committee for selecting me for this prize. It is an unexpected honor, and I am delighted to accept it. I am indebted to my teachers, collaborators, colleagues at MIT, and students for their encouragement and inspiration over the years.

Around the time of my Ph.D., I switched from being a topologist with a strong interest in Lie theory to being a representation theorist with a strong interest in topology. (The switch happened with some coaching by Michael Atiyah and later by Roger Carter.) After that most of my research was concerned with the study of representations of Chevalley groups over a finite field or used the experience I gained from groups over a finite field to explore neighbouring areas such as p-adic groups (which can be viewed as groups over a finite field that are infinite dimensional) or quantum groups (which can be viewed as analogues of the Iwahori-Hecke algebras, familiar from the finite group case).

Here are three topics from my research which I am particularly fond of:

(i) the classification of complex irreducible representations of a finite Chevalley group;

(ii) the theory of character sheaves, which helps in computing the irreducible characters in (i);

(iii) the theory of canonical bases arising from quantum groups, which unexpectedly provides a very rigid structure with coefficients in the natural numbers for several of the known objects in Lie theory.

I would like to make some comments on the period in which I focused on topic (i) above, from late 1975 (when my paper with Deligne (DL) was just completed) to the spring of 1978. In the first few months of that period I worked on the "Coxeter paper" (CP), in which I studied in detail the cohomology with compact support of the variety attached in (DL) to a Coxeter element in the Weyl group. Luckily, in this case the eigenvalues of Frobenius could be explicitly computed, and the eigenspaces provided a complete decomposition into irreducible representations, giving several new key examples of cuspidal representations. Then during the next year I found the classification and degrees of the irreducible representations of classical groups over a finite field using an extension of the method of (DL). After this (in 1977), as I wrote the notes for my lectures in the CBMS Regional Conference Series, No. 39, I found the classification and degrees of the irreducible unipotent representations of the finite exceptional groups of type other than E_8, based on (DL) and (CP). Towards the end of 1977 I discovered the nonabelian Fourier transform attached to any finite group *H* (which in the case where *H* is abelian reduces to the ordinary Fourier transform for functions on *H* times its dual). This new Fourier transform allowed me to find (in the spring of 1978) the classification and degrees of the irreducible unipotent representations for E_8. The same (or somewhat easier) methods can be used to obtain the classification and degrees of nonunipotent irreducible representations of finite exceptional groups. Thus, contrary to what the citation says, the classification of irreducible representations of finite exceptional groups does not depend on the "geometry of the unipotent cone" or on my work with Kazhdan done in 1979 (KL). On the other hand, the latter (KL) did play a role in my work (1981, 1982) on computing the values of irreducible characters on semisimple elements, and the former played a role in my work (1983–1986) on character sheaves. Moreover, the use of (KL) simplifies some of the arguments in the classification, as I showed in my 1984 book.

Leroy P. Steele Prize for Mathematical Exposition

The Leroy P. Steele Prizes were established in 1970 in honor of George David Birkhoff, William Fogg Osgood, and William Caspar Graustein and are endowed under the terms of a bequest from Leroy P. Steele. Prizes are awarded in up to three categories. The following citation describes the award for Mathematical Exposition.

Citation

Neil Trudinger

The Leroy P. Steele Prize for Mathematical Exposition is awarded to Neil Trudinger in recognition of his book *Elliptic Partial Differential Equations of Second Order*, written with the late David Gilbarg.

The global theory of nonlinear partial differential equations was mostly restricted to PDE involving two variables until the late 1950s, when fundamental estimates of DeGiorgi and Nash for second-order elliptic (and parabolic) equations finally broke open such PDE in more variables. The subject thereupon exploded beyond all expectations, and nowadays the analysis of even extremely degenerate and highly nonlinear second-order elliptic PDE in many variables is fairly routine, if very technical in detail.

Neil Trudinger, starting with the original 1977 edition of his book with Gilbarg, has recorded the progress of the field. He has reworked the breakthroughs, many due to him, recasting these technical estimates into understandable form within the fixed notation and framework of this highly cited book in its various domestic and foreign editions. His service has been invaluable. Having this foundational reference has made it possible for young researchers to enter the field, which would otherwise have been impenetrable. Here they can read in full detail all about Schauder estimates, Sobolev spaces, boundary estimates, Harnack inequalities, a priori derivative bounds, and much, much more.

Good mathematical exposition is always difficult, but it is especially so for technical estimates. The heights to which the research community has pushed the analysis of nonlinear second-order elliptic PDE is amazing, but the fundamental inequalities are mostly without any good heuristic interpretations. Hard analysis is both hard and hard to explain: Neil Trudinger's concise, elegant exposition in this outstanding book is magnificent.

Biographical Note

Neil S. Trudinger was born in Ballarat, Australia, in 1942. After schooling and undergraduate education at the University of New England in Australia, he completed his Ph.D. at Stanford University in 1966. Following appointments at the Courant Institute (1966–67); University of Pisa, Italy (1967); Macquarie University, Australia (1968–70); University of Queensland, Australia (1970–73); University of Minnesota (1970–71), and Stanford University (1971), he took up a chair of mathematics at the Australian National University in 1973, where he has been since. During this period he has also held numerous visiting positions at universities in Asia, Europe, and the United States, as well as a professorship at Northwestern University from 1989 to 1993. Among various administrative positions at the Australian National University, he was head of the Department of Pure Mathematics from 1973 to 1980, director of the Commonwealth Special Research Centre for Mathematical Analysis from 1982 to 1990, and dean of the School of Mathematical Sciences from 1992 to 2000.

Neil Trudinger is a fellow of the Australian Academy of Science and a fellow of the Royal Society of London. He was also chief judge in the Singapore National Science Talent Search in 2002. His research contributions, while largely focussed on nonlinear elliptic partial differential equations, have also spread into functional analysis, geometry, computational mathematics, and, more recently, optimal transportation.

Response from Neil Trudinger

I am very honoured and pleased to receive the Steele Prize for Mathematical Exposition. I could never have imagined forty years ago when my book with David Gilbarg on elliptic partial differential equations was first published that it would get such recognition. The book was originally conceived by us after I had prepared lecture notes for the spring quarter of the graduate PDE course at Stanford in 1971. My topics were Sobolev spaces and their application to linear elliptic PDE, and we decided to start by blending these with earlier notes of Dave on the Schauder theory. Six years later and after a lot of hard work, including long and painful negotiations over language, the first edition appeared. We were extremely fortunate to have incredible assistance. First was the impeccable typing of Anna Zalucki in Canberra and Isolde Field at Stanford. Isolde had already typed my Ph.D. thesis at Stanford several years earlier, and Dave had been my supervisor, so the Stanford team was ready to roll from the outset. In Australia I had an amazing research assistant, Andrew Geue, who checked every bibliographical reference against its original publication so that titles and page numbers were always correct. We also got plenty of encouragement and support from many colleagues over the succeeding years to whom I am very grateful, as well as to those old friends Catriona Byrne and Joachim Heinze at Springer in Heidelberg.

My own passage into mathematical exposition was rather severe, akin to learning to swim by being thrown in a deep ocean. My first postdoctoral position in 1966 was a Courant Instructorship, and I was assigned an advanced topics course in PDE for the full year. Armed with books by Bers, John, and Schechter on partial differential equations; Morrey on multiple integrals in the calculus of variations; Friedman on parabolic partial differential equations; as well as works of Ladyzhenskaya and Ural'tseva, Moser, Serrin and Stampacchia from my graduate days, I struggled to teach a full-year course on elliptic and parabolic equations to students who all looked older than my meagre twenty-four years. But this torture had its rewards. I presented a then recent and now famous paper by John and Nirenberg on BMO as it was needed for the Moser Harnack inequality. Subsequently, I found that it could be bypassed for the Harnack inequality through a simpler argument, a byproduct of which was an exponential-type imbedding result, later sharpened by Moser and now well known as the Moser-Trudinger inequality. At the same time, my quest to understand loss of compactness in Sobolev imbeddings led to the Yamabe "problem". But most of all I was extremely well equipped when I started work on the book a few years later.

I conclude on a sad note. Both David Gilbarg and Isolde Field passed away in recent years. This honour is for you, Dave and Isolde!

Leroy P. Steele Prize for Seminal Contribution to Research

The Leroy P. Steele Prizes were established in 1970 in honor of George David Birkhoff, William Fogg Osgood, and William Caspar Graustein and are endowed under the terms of a bequest from Leroy P. Steele. Prizes are awarded in up to three categories. The following citation describes the award for Seminal Contribution to Research.

Citation

Endre Szemerédi

The Steele Prize in 2008 for a Seminal Contribution to Mathematical Research is awarded to Endre Szemerédi for the paper "On sets of integers containing no k elements in arithmetic progression", *Acta Arithmetica* XXVII (1975), 199–245.

A famous result of arithmetic combinatorics due to Van der Waerden in 1927 proving an earlier conjecture of Baudet states that if we partition the natural integers into finitely many subsets, then one of these subsets contains arithmetic progressions of arbitrary length. In its finite version, because of the inevitable use of a multiple induction argument, it leads to incredibly large bounds for the size of a set of consecutive integers such that for every k-partition of it there is always a subset containing an arithmetic progression of k terms. In 1936 Erdős and Turán proposed, as a natural extension of Van der Waerden's theorem, the conjecture than any infinite set of integers of positive density contained arbitrarily long arithmetic progressions; this may be viewed as a discrete analog of the classical theorem of Lebesgue that almost every point of a set of positive measure of real numbers has density 1. This conjecture quickly became one of the major open questions in Ramsey theory.

The first nontrivial result about the Erdős-Turán conjecture was obtained by K. F. Roth in 1953 using harmonic analysis, proving it for progressions of length 3, but his method did not extend to length 4 in any obvious way. In 1969 Szemerédi proved the Erdős-Turán conjecture for length 4 using a difficult combinatorial method. Finally, the Erdős-Turán conjecture was settled in the affirmative by Szemerédi in his landmark 1975 paper.

The solution is a true masterpiece of combinatorics, containing new ideas and tools whose impact go well beyond helping to solve a specific hard problem. One of these new tools, his by the now famous Regularity Lemma, has become a foundation of modern combinatorics. Its statement of striking simplicity asserts roughly that any sufficiently large dense graph can be approximated by a union of a bounded number of very regular subgraphs of almost equal size, looking in pairs like very regular bipartite graphs; the upper and lower bounds for the number of subgraphs are determined only by the desired quality of approximation and are independent of the size of the graph. In essence, every large dense graph is well approximated by a controlled bounded union of quasirandom bipartite graphs of almost equal size. This is a very surprising result, far from intuitive. The proof is short but very subtle, leading to bounds for the number of components larger than any tower of exponentials. The subtlety of the statement has been confirmed by recent work by Gowers, showing that these gigantic bounds are indeed necessary for the validity of the Regularity Lemma in all cases.

The impact in combinatorics of the Regularity Lemma and of the numerous variants that followed it is due to the fact that there are many techniques available for studying random graphs and, via the Regularity Lemma, they can be transferred to the study of completely arbitrary graphs. It is fair to say that the Regularity Lemma has transformed the focus of graph theory from the study of special graphs and of extremal problems to the study of general graphs and random graphs. Beyond combinatorics it has found applications in number theory and in computer science, in particular in complexity theory.

However, the impact of Szemerédi's paper goes beyond this. The solution of the Erdős-Turán conjecture stimulated other mathematicians to find other lines of attack. In 1977 Furstenberg found a new proof of Szemerédi's theorem using deep methods of ergodic theory, together with a correspondence principle showing the equivalence of Szemerédi's theorem with his new ergodic theorem. Furstenberg's new method could then be used to attack multidimensional versions of the theorem as well as nonlinear versions. In 2001 Gowers obtained a new proof of Szemerédi's theorem, based on his novel idea of a Fourier analysis with nonlinear phases. More recently, Green and Tao were able to replace the positive density condition in Szemerédi's theorem by other arithmetical conditions, which allowed them, using again a suitable transference principle, to prove the same result for any sequence of primes of relative positive density, thereby solving another famous conjecture of Erdős considered inaccessible by standard methods of analytic number theory.

Recent work by many authors strongly indicates that these different approaches to Szemerédi's theorem are all interrelated. There is no doubt that Szemerédi's landmark paper is the source of these beautiful developments in mathematics.

Biographical Note

Endre Szemerédi was born in Budapest in 1940. He finished university in Budapest, at ELTE University. He received his Ph.D. at the Moscow State University.

He has been a member of the Renyi Institute of the Hungarian Academy of Sciences since 1970. Currently he is a professor in the Department of Computer Sciences, Rutgers University.

He is a member of the Hungarian Academy of Sciences. In 1976 he received the Pólya Prize.

Response from Endre Szemerédi

I am really grateful to the AMS, to the Steele Prize Committee, and to those people who recommended me. This prize is a great honor.

Here is what actually sparked my work on $R_4(n)$. Assuming that it was a well-known fact that dense sets of integers have arithmetic progressions of length four, I proudly showed Paul Erdős a proof that no positive fraction of elements in a long arithmetic progression could be squares. Erdős pointed out a flaw in the argument, namely that $R_4(n)$ was actually an open problem and that the rest of my proof was in fact already known to Euler. So now I really had to work on $R_4(n)$. Once $R_4(n)$ was settled, so was the original problem about squares. Later, Bombieri, Grenville, and Pintz greatly improved my result. Luckily for me this occurred several years after $R_4(n)$; otherwise I would never have worked on it.

It is my opinion (and maybe only mine) that the Regularity Lemma was born after the $R_k(n)$ result, though certainly inspired by ideas from that paper. It is necessary to acknowledge Andras Hajnal for the $R_k(n)$ paper and Vasek Chvatal for the Regularity Lemma paper. These friends literally wrote every word of the papers based on my explanations. I also want to express my gratitude to Paul Erdős and to K. F. Roth for their encouragement to persevere with $R_k(n)$.

This award could not have occurred were it not for the fundamental work of other mathematicians who developed the field of additive combinatorics and established its relations with many other areas. Without them my theorem is only a fairly strong result, but no “seminal contribution to research”. I acknowledge my debt to them. Finally, I want to thank my wife, Anna, for all her patience, good humor, and support.

Certificates of Meritorious Service

The Certificate of Meritorious Service is presented for service at the national level or for service to a section of the Association. The first such awards were made in 1984. At each January meeting of the Association, honorees from several sections are recognized.

Citation

Herbert Kasube, Illinois Section

Dr. Herbert Kasube is associate professor of mathematics at Bradley University, where he has been a member of the faculty since 1978. He holds a Ph.D. in mathematics from the University of Montana. At Bradley he has served many years on the Curriculum Committee and the Awards Committee for the mathematics department. At the university level he has been a member of the Admissions and Retention Committee and the Academic Review Board. His department chair describes him as a teacher who is in much demand from students at Bradley. Students report that they learn a lot in his courses and that he cares deeply that they learn mathematics.

Dr. Kasube's professional interests include number theory, discrete mathematics, mathematics education, and (perhaps most importantly) the history of mathematics.

He is and has been an active and highly valued member and officer of the MAA and of the Illinois Section (ISMAA). Dr. Kasube has given numerous well-received talks at ISMAA meetings and has been an active and valued member of the Illinois Section for many years. He is a past chair of the Nominating Committee, the Awards Committee, Liaison Committee, chair of the section, and a past recipient of our Distinguished Service Award.

Currently, Dr. Kasube serves as a member of the MAA Committee on the Undergraduate Program in Mathematics (CUPM) and its subcommittee on Curriculum Reform and the First Two Years (CRAFTY), regional director for the American Mathematics Competitions 8/10/12, a member of the Board of Directors of the ISMAA, and the governor of the Illinois Section.

Response from Herbert Kasube

I am both humbled and honored to receive the Meritorious Service Award from the MAA. I must first thank the members of the Illinois Section who nominated me. The fact that they think that much of me and my work means more to me than I can describe. My service to the Illinois Section and the MAA in general is very much a labor of love. I truly enjoy giving back to an organization that has given so much to me. There are too many individuals to thank that I do not want to forget anyone, but I must mention my late wife, DorAnn, who was always there for me, and my daughter, Emilie, who continues to be an inspiration. The Illinois Section and MAA are families to me, and I love the members from the bottom of my heart. Thank you again.

Citation

Donald E. Bennett, Kentucky Section

Donald E. Bennett of Murray State University has been a member of the Kentucky Section of the MAA since 1970. He has been actively involved in mathematics education at all levels, ranging from elementary school through university. He has worked closely with the Education College at Murray State to develop programs that target mathematical proficiency for elementary, middle, and high school teachers. At the local level he has worked with high school administrators on testing 11th-grade students to determine college math readiness in time to take a 12th-grade math course if needed. He has worked on the state level to develop standards for middle school mathematics. He has been an outside evaluator for math programs at other universities. Bennett has been very active in the Kentucky Section for many years. He served as chair-elect and then chair from 1985 to 1988 and as governor from 1999 to 2001. He was the site coordinator three times when Murray State University hosted the KYMAA annual meeting in 1985, 1996, and 2004. He has served on many nominating committees and teaching award committees for the section over the years. In 2006 he served as a panel member discussing the tenure process at our first KY Section NExT meeting. For more than thirty years Bennett has traveled from one end of the state to the other to participate in section meetings. For all his work on behalf of the mathematics community throughout the state, we are pleased to nominate Donald Bennett to receive the MAA Award for Meritorious Service.

Response from Donald E. Bennett

I am surprised, thrilled, and honored to receive a Meritorious Service Award. The MAA is a valuable organization for collegiate mathematics, and I am proud to have been a member for many years. Due to the organizational structure of the MAA, there are ample opportunities for individuals to become involved in their section and at the national level. Through these many service opportunities, I have enjoyed working with my professional colleagues in the Kentucky Section, at the national level, and interacting with the officers and staff of the MAA. Being involved in promoting and supporting mathematics and mathematics education has been and will continue to be an educational and personally rewarding experience.

Citation

Victor Gummersheimer, Missouri Section

In the fall of 1976, Dr. Victor Gummersheimer began working as a member of the faculty at Southeast Missouri State University. He quickly became involved in the MAA and was section chair in 1983, organizing the annual section meeting in 1984. This commitment involved a three-year tour as a section officer, starting as vice chair in 1982 and concluding as past chair in 1985. He served as secretary-treasurer from 1989 to 1992 and as newsletter editor from 1993 to 1999. During these next two tours of service, Gummersheimer was always known for his professionalism in performing his assigned duties. His fourth and final tour of service was as section governor from 2000 to 2003. During this time we saw the section remain strong, and he helped to involve new people in the section, both as officers and at section meetings. He has also served on section nominating committees several times and is always helping out at section meetings.

When the MAA started the Departmental Liaison program, Vic volunteered to be the liaison for the Southeast, a position that he continues to hold.

During his twelve years as department chair, Vic has witnessed a large turnover of faculty, mostly due to retirements. The retirees were virtually all active in the section, but departmental involvement in the section has actually increased during his tenure as chair. He encourages involvement at all levels, as witnessed by the many section officers that have come from the Southeast and the large contingent that comes to the section meeting each year in spite of the drive, which usually exceeds five hours (in 2007, eleven of twenty-three faculty members attended, along with nine students). Vic has also encouraged faculty involvement at the national level: four faculty members are Project NExT Fellows, the late Jim Bruening was governor and coeditor of the *College Mathematics Journal* Problem Section, and Tim Ray is chair of the MAA Committee on Departmental Liaisons.

In light of his sustained and significant record of service in section government, involvement at the section and national level with the Liaisons program and national meetings, and his encouragement of the Southeast faculty to be involved in the MAA, Dr. Victor Gummersheimer is highly deserving of the Meritorious Service Award.

Response from Victor Gummersheimer

I accept this Meritorious Service Award with sincere thanks to the MAA and my colleagues and friends in the Missouri Section. I have enjoyed working with these talented people who recognize the value of the MAA and are willing to work tirelessly for the benefit of the mathematical community. The contributions I have made over the years are due in part to the leadership and example of my first department chairperson, Harold Hager, who early on introduced me to the section organization, objectives, and opportunities to serve.

Citation
Leonard F. Klosinski, Northern California, Nebraska, and Hawaii Section

The Northern California-Nevada-Hawaii Section is pleased to announce its selection of Leonard F. Klosinski of Santa Clara University to receive its 2007 Certificate of Meritorious Service.

Secretaries of organizations traditionally serve for long terms—much longer than presidents and other officers—and they often provide institutional memory to assist other officers throughout their terms. But most do not serve as long as Leonard Klosinski, who was secretary-treasurer of the Northern California-Nevada-Hawaii Section for twenty-one years. This was followed by a three-year stint (2000–2003) as vice chair (in this section, chair-elect), chair, and program chair. Following that he was elected section governor, representing the section on the national Board of Governors. He also chaired the section's Teaching Awards Committee for three years and, before that, directed the secondary school visiting lecturer program. Over much of that time he has been managing editor of the section newsletter (*Mini-Focus*) from issue number 3 in 1977 up to the present. In 1988, having been part of the history of the section for over fifteen years, he published a section history. A second volume appeared in 2001 to bring that history up to date. On the national scene, in 2000 he won the MAA's Haimo Award for Distinguished College or University Teaching of Mathematics after having been awarded the section's teaching award earlier.

He is known to fanciers of problems as the national director of an important MAA activity: the William Lowell Putnam Mathematical Competition. There, too, he has set records for longevity, having been director for roughly thirty years, much longer than any previous director.

The section is grateful for this long record of service, and the Mathematical Association of America is proud to award its 2007 Certificate of Meritorious Service to Leonard F. Klosinski.

Response from Leonard F. Klosinski

It is most gratifying to receive formal recognition for making contributions to the MAA and particularly to the Northern California, Nevada, and Hawaii Section. It has always been a great pleasure working with the officers and members of the section over these many years. I was indeed fortunate to have the opportunity to be able to serve the section and the Association, and this award brings to mind wonderful memories.

Citation

H. Joseph Straight, Seaway Section

The Seaway Section is pleased to nominate Dr. H. Joseph Straight for the MAA Certificate of Meritorious Service in recognition for his ongoing service to both the section and the MAA.

Professor Straight received his Ph.D. from Western Michigan University in graph theory under Donald Lick and has been on the faculty at SUNY Fredonia since 1977.

Dr. Straight has held many offices in the Seaway Section: program chair, chair, governor, and newsletter editor. He is an active member of the MAA Committee on Sections and the Committee on Minicourses.

As section chair, Joe initiated overdue changes in the section's bylaws and helped to fashion the MAA template for sectional bylaws as a member of the Committee on Sections. He also created an Educational Policies Committee to advise the section on mathematics education matters, K–16.

As editor he oversaw the transformation of the newsletter from its previous humble form to an electronic format.

Response from H. Joseph Straight

I am much honored to be recognized by the Seaway Section with the Meritorious Service Award. My involvement with the MAA and the Seaway Section has been one of the most rewarding aspects of my professional life. I attended my first Seaway Section meeting in 1973 with some of my professors from SUNY Fredonia, including Art Danese, Dick Dowds, Frank Olson, and Al Polimeni. After graduate school, as luck would have it, I ended up back at Fredonia and back in the Seaway Section, and attended meetings and contributed talks whenever I could. In 1990 Chuck Diminnie and Steve Cavior got me involved as an officer. I thank them for showing confidence in me and acknowledge their wise counsel, as well as that of Jack Graver, Rebecca Hill, and Don Trasher. I also thank Cheri Boyd, Ed Hoefer, Luise-Charlotte Kappe, Len Malinowski, Grace Orzech, and Bob Rogers for their assistance and unwavering dedication to the section.

Citation

Andrew Matchett, Wisconsin Section

The Wisconsin Section gratefully acknowledges the service of Professor Andrew Matchett of the University of Wisconsin-LaCrosse. Matchett is in his twenty-fourth year of teaching at UW-La Crosse. He was the secretary-treasurer for the Wisconsin Section of the MAA from 1985 to 2006. In fact, many MAA members from across the state will say that he has been the Wisconsin Section. Until recently Matchett operated all the MAA book sales at section meetings. He is currently the sole candidate for chair-elect of the section, and the section is once again looking forward to his leadership.

Professor Matchett has been a member of both the MAA and AMS for over twenty years. He received his Ph.D. from the University of Illinois and B.S. from the University of Chicago. He has published papers in matrix theory and integral group rings, but his research interests are eclectic, and he has given talks on principal components, rainbows, dynamical systems, and curriculum reform. Matchett's professional life has been devoted mainly to undergraduate teaching. His current research interests are in probability and statistics.

Response from Andrew Matchett

It is an honor to receive the MAA Meritorious Service Award. Looking back over several years of work in the Wisconsin Section, I find that the good—the marvelous, wise, and talented people that I have had the pleasure to work with—far outweighs the bad—looming deadlines, late nights spent finalizing reports, missed talks at meetings, calamities at registration tables, etc. In fact, the good has outweighed the bad by a very large margin, which says something about the people, the mathematicians, the teachers. I am therefore humbled and, at the same time, deeply appreciative to my good colleagues, present and past, and to the MAA for this honor.

Beckenbach Book Prize

The Beckenbach Book Prize, established in 1986, is the successor to the MAA Book Prize, which was established in 1982. It is named for the late Edwin Beckenbach, a long-time leader in the publications program of the Association and a well-known professor of mathematics at the University of California at Los Angeles. This prize is awarded to an author of a distinguished, innovative book published by the MAA. The award is not given on a regularly scheduled basis, but is given only when a book appears that is judged to be truly outstanding.

Citation

William Dunham

Euler: The Master of Us All, The Mathematical Association of America, Dolciani Mathematical Expositions, Vol. 22, 1999.

William Dunham's exposition of a selection of the innovative and influential work of the brilliant and prolific mathematician Leonhard Euler (1707–1783) in *Euler: The Master of Us All* is itself innovative and brilliant in its organization and scope, its clarity and verve, and its accessibility and appeal. After providing a biographical sketch, Dunham devotes one chapter each to important contributions by Euler to eight areas of mathematics. He begins each chapter with a description of the historical development of the topic up to the time of Euler. The central "Enter Euler" section focuses on selected groundbreaking contributions of Euler to the topic. Each chapter closes with subsequent work of Euler and other mathematicians on the topic. Despite the author's expressed regret over having to make a very narrow selection from Euler's immense body of work, readers are certain to find topics that appeal to them from among algebra, geometry, logarithms, complex variables, infinite series, number theory (elementary and analytic), and combinatorics, and to be drawn to the others by Dunham's witty and engaging style. Indeed, Dunham is well known for writing mathematical page-turners, and this book is no exception: the seamless presentation of mathematics and its history is so entertaining, accessible, clear, and lively that it is difficult to put the book down until one has read it from cover to cover. Besides his inimitable writing style, the author is to be commended for his inspired yet careful selection and organization of historical and mathematical material and for his presentation of Euler's mathematical work in such a clear and accessible yet faithful manner. The Mathematical Association of America is pleased to name William Dunham as the recipient of the 2008 Beckenbach Book Prize.

Biographical Note

William Dunham is the Koehler Professor of Mathematics at Muhlenberg College. He holds a B.S. from the University of Pittsburgh (1969) and an M.S. (1970) and Ph.D. (1974) from The Ohio State University.

Dunham has authored four books—*Journey through Genius: The Great Theorems of Mathematics* (Wiley, 1990), *The Mathematical Universe* (Wiley, 1994), *Euler: The Master of Us All* (MAA, 1999), and *The Calculus Gallery: Masterpieces from Newton to Lebesgue* (Princeton, 2005)—and has edited *The Genius of Euler: Reflections on His Life and Work* (MAA, 2007) as part of the Euler tercentenary celebration. He previously received the MAA's George Pólya Award (1992), Trevor Evans Award (1997), and Lester R. Ford Award (2006) for expository writing; and *The Mathematical Universe* was recognized by the Association of American Publishers as the Best Mathematics Book of 1994.

Response from William Dunham

To be awarded the Beckenbach Book Prize for my book on Euler is a career highlight, and I am grateful to the prize committee for this honor. I want to thank the MAA's inimitable Don Albers, who launched this project in the summer of 1990 and encouraged it at every step along its journey to publication in 1999. Likewise I thank my wife and Muhlenberg colleague, Penny Dunham, who has played a key role in everything I've done for nearly four decades. Last but not least, I tip my hat to the great Leonhard Euler, a mathematician whose legendary output could generate a multitude of books like this one.

David P. Robbins Prize

In 2005 the family of David P. Robbins gave the Mathematical Association of America funds sufficient to support a prize honoring the author or authors of a paper reporting on novel research in algebra, combinatorics, or discrete mathematics. The prize of $5,000 is awarded every third year. David Robbins spent most of his career on the research staff at the Institute for Defense Analyses-Center for Communications Research (IDA-CCR) in Princeton. He exhibited extraordinary creativity and brilliance in his classified work while also finding time to make major contributions in combinatorics, notably to the proof of the MacDonald Conjecture and to the discovery of conjectural relationships between plane partitions and alternating sign matrices. The 2008 prize is the first awarded by the Mathematical Association of America.

Citation

Neil J. A. Sloane

"The On-Line Encyclopedia of Integer Sequences," *Notices of the American Mathematical Society* 50 (2003), 912–915.

The MAA David P. Robbins Prize is for "a paper reporting on novel research in algebra, combinatorics, or discrete mathematics." For the first prize, we have chosen Neil Sloane's most recent paper describing his ongoing "on-line encyclopedia of integer sequences (OEIS)" efforts.

Although not quite a research paper in the usual sense, the paper describes an extraordinary research tool that has had an impact on mathematics far beyond that of almost any paper, especially in the areas that David Robbins cared so much about. In addition, this work is in many ways deeply in tune with Robbins's approach to mathematics; i.e., when in doubt, compute some examples!

The OEIS enables mathematicians to identify sequences from a few (perhaps very few) terms, giving them access to a wealth of information that might immediately point their research in useful directions. One of the most distinctive instances is when research in one area is connected to research in a completely unrelated area. In a random recent example, an algebraic geometer found that a sequence of dimensions, each difficult to compute, was the same sequence of numbers that arose in a topological context in physics. The interaction between the two of them led to a proof of the equivalence of the sequences, a more efficient algorithm to compute the sequence, and a joint paper. The importance and pervasiveness of this tool is evident from the number and diversity of papers that cite the OEIS.

Another measure of its importance comes from the fact that the database has more than 120,000 entries, an active editorial board with twenty-five members, and a Wikipedia entry. The accessibility of the project is evident from the fact that the list of major contributors includes undergraduates and from the fact that the tool is of genuine interest to students and amateur mathematicians as well as researchers.

The scale of the impact of this tool, as well as its combinatorial tilt and strong experimental flavor, make it especially appropriate to recognize by giving the first MAA Robbins Prize to Neil J. A. Sloane for his paper and the research that it describes.

Biographical Note

Neil J. A. Sloane received his Ph.D. in electrical engineering from Cornell University in 1967. After two years as an assistant professor there, he joined AT&T Bell Labs (now AT&T Shannon Labs), where he has been ever since. He is the author or coauthor of books on error-correcting codes, sphere packing, integer sequences, optics, and rock climbing. He is a member of the National Academy of Engineering, an AT&T Fellow, and an IEEE Fellow. He has received numerous awards, including the Chauvenet Prize of the MAA, the IEEE Hamming Medal, and the Shannon Award of the IEEE Information Theory Society.

Response from Neil J. A. Sloane

This is a very great honor, especially as David Robbins is responsible for one of the most famous sequences in "The On-Line Encyclopedia of Integer Sequences," the Robbins numbers 1, 2, 7, 42, 429, 7436, …, entry A5130. I should like to thank the thousands of volunteers who have contributed to the OEIS over the years by sending in sequences, correcting or extending entries, and helping with the computer programs that keep it running. Without their help the OEIS would not exist in its present form. I should also like to thank AT&T for supporting this work for nearly forty years. Two things above all have made the forty years of work worthwhile: the ever-increasing list of articles that acknowledge help from the OEIS and the pleasure of seeing new sequences as they arrive (e.g., 1, 9, 9, 5, 5, 9, 9, 5, 5, 9, 1, 3 …, A131744!).

Yueh-Gin Gung and Dr. Charles Y. Hu Award for Distinguished Service to Mathematics

The Gung and Hu Award for Distinguished Service to Mathematics, first presented in 1990, is the endowed successor to the Association's Award for Distinguished Service to Mathematics, first presented in 1962. This award is intended to be the most prestigious award for service offered by the Association. It honors distinguished contributions to mathematics and mathematical education, in one particular aspect or many, and in a short period or over a career. The initial endowment was contributed by husband and wife Dr. Charles Y. Hu and Yueh-Gin Gung. It is worth noting that Dr. Hu and Yueh-Gin Gung were not mathematicians, but rather a professor of geography at the University of Maryland and a librarian at the University of Chicago, respectively. They contributed generously to our discipline because, as they wrote, "We always have high regard and great respect for the intellectual agility and high quality of mind of mathematicians and consider mathematics as the most vital field of study in the technological age we are living in."

Citation
Lida K. Barrett

Lida K. Barrett's solid mathematical background and her ability to get at the heart of problems and to find bold solutions led her into positions in mathematical policy: as a senior administrator at several universities, as president of the Mathematical Association of America, as senior staff associate at the National Science Foundation, and as professor of mathematics at the U.S. Military Academy at West Point. To this day, she continues to serve on many committees and boards and to contribute to mathematics, to mathematics education, and to increasing the participation of members of underrepresented groups in mathematics.

Her first administrative role was in 1973 as head of the mathematics department at the University of Tennessee at Knoxville, the first female department head in the College of Arts and Sciences and one of the first women to head a doctoral mathematics program. (It was not until 1970, after her husband's death, that she was able to hold a tenured position, becoming only the third female full professor in the college.)

As associate provost at Northern Illinois University (NIU), Dr. Barrett formed a blue ribbon committee to review the entire undergraduate experience. She next served as dean of Arts and Sciences at Mississippi State University. In these positions, she remained an active supporter of the MAA Illinois and Louisiana-Mississippi Sections, respectively.

Lida Barrett served on the MAA's Audit and Budget Committee from 1984 until 1989, when she became president-elect of the Association. She advocated keeping the MAA headquarters at its current location and supporting its historical preservation. As the second female president of the MAA, Barrett sought to increase minority membership and involvement in the MAA and within the mathematics community. She helped initiate and/or enhance MAA programs and committees highlighting minority interests. She supported national awareness initiatives such as Mathematics Awareness Week (later Mathematics Awareness Month) and strengthened the relationship between the MAA and the AMS that remains to this day.

Throughout her life Professor Barrett has championed the causes of the teaching and learning of exemplary mathematics in the schools and colleges of our nation and of increasing the representation of underrepresented groups in mathematics. In 1988–1989 she served as a member of the Committee on the Mathematical Sciences in the Year 2000 (a committee of the National Academy of Sciences) and in 1989–1992 as a member of the Mathematical Science Education Board. Through her work at the National Science Foundation as senior staff associate for precollege education for the Directorate of Education and Human Resources (EHR), she helped develop and sharpen EHR's investments in K–12 science and mathematics education. She contributed to a ramped-up K–12 effort at the NSF and was instrumental in developing the K–12 subgroup report that became part of the federal government's first five-year plan (1994–1998) as laid out in the Federal Coordinating Council for Science, Engineering, and Technology (FCCSET) report. At the NSF she organized three major national invitational conferences on science and technology education, which provided important tools for moving the NSF to the forefront of national education initiatives in areas of mathematics, science, engineering, and technology.

Dr. Barrett later went on to the U.S. Military Academy at West Point, where she taught undergraduate mathematics and was involved in the professional development of the Academy's instructors.

Lida Barrett received her bachelor's degree from Rice University at the age of eighteen, but her interest in mathematics began much sooner as a member of her junior high school mathematics team in Texas. Perhaps her concern for the plight of women and minority students in mathematics dates back to her college days. When she arrived as a graduate student in mathematics at the University of Texas, she and Mary Ellen Rudin were the only female graduate students. She met and married a fellow graduate student, John H. Barrett, and followed him to the University of Pennsylvania. Although her mathematical development was influenced by R. L. Moore, she finished her Ph.D. under John Kline at the University of Pennsylvania. She suffered from the effects of the "anti-nepotism" rules that plagued many women for many decades until they were slowly abandoned during the 1970s and 1980s. But she persevered, saying, "You take the hand that's dealt you; you look at the challenges that are there, and you meet them, head on." Her husband died at an early age, leaving her with a family of three children to raise while she pursued a rigorous career in mathematics. All of these experiences made her an exemplary mentor and role model for many young women in mathematics.

It is a pleasure to present her with the 2008 Yueh-Gin Gung and Dr. Charles Y. Hu Award for Distinguished Service to Mathematics.

Biographical Note

Lida K. Barrett holds a B.A., Rice University (1946); an M.A., University of Texas (1949); and a Ph.D., University of Pennsylvania (1954). In 1950 she married John H. Barrett, a fellow graduate student at Texas. He died in 1969. She has three children, four grandchildren, and one great-grandchild.

Professor Barrett was a faculty member/administrator at the University of Utah, the University of Tennessee (head, 1973–1980), Northern Illinois University (associate provost), and Mississippi State University (dean of Arts and Sciences). After retiring from MSU, she was a senior administrator in the Education and Human Resources Directorate of the NSF, and then returned to teaching at West Point. She has published in general topology, applied mathematics (while consulting at Oak Ridge), and mathematics education.

Response from Lida K. Barrett

I am honored to have received this prize. The Mathematical Association of America has been an important part of my life. The many activities offered have contributed significantly to my career: the hour addresses that kept me aware of the vast scope of mathematics, the panel discussions and other presentations on current professional topics, and the opportunities to meet and discuss mathematics and educational activities with my fellow mathematicians. Working on committees and projects within MAA and within the broader mathematical community has enriched my professional life. Friendships with the many fine folks in MAA have provided a special plus. I am especially grateful to Professor Harlan Miller, who pushed me to work on a Ph.D. at Texas, and to my late husband, John Barrett, who, after he completed his degree, insisted I finish mine and kept house for us while I did.

Summary of Awards

For AMS

Award for Distinguished Public Service: Herbert Clemens

Bôcher Memorial Prize: Alberto Bressan, Charles Fefferman, Carlos E. Kenig

Frank Nelson Cole Prize in Number Theory: Manjul Bhargava

Levi L. Conant Prize: J. Brian Conrey, Shlomo Hoory, Nathan Linial, Avi Wigderson

Joseph L. Doob Prize: Enrico Bombieri, Walter Gubler

Leonard Eisenbud Prize for Mathematics and Physics: Hirosi Ooguri, Andrew Strominger, Cumrun Vafa

Leroy P. Steele Prize for Lifetime Achievement: George Lusztig

Leroy P. Steele Prize for Mathematical Exposition: Neil Trudinger

Leroy P. Steele Prize for Seminal Contribution to Research: Endre Szemerédi

For AMS-MAA-SIAM

Frank and Brennie Morgan Prize for Outstanding Research in Mathematics by an Undergraduate Student: Nathan Kaplan

For AWM

Louise Hay Award for Contributions to Mathematics Education: Harriet S. Pollatsek

Alice T. Schafer Prize for Excellence in Mathematics by an Undergraduate Woman: Galyna Dobrovolska, Alison Miller

For JPBM

Communications Award: Carl Bialik

For MAA

Beckenbach Book Prize: William Dunham

Certificates of Meritorious Service: Herbert Kasube, Donald E. Bennett, Victor Gummersheimer, Leonard F. Klosinski, H. Joseph Straight, Andrew Matchett

Chauvenet Prize: Andrew Granville

David P. Robbins Prize: Neil J. A. Sloane

Euler Book Prize: Benjamin H. Yandell

Yueh-Gin Gung and Dr. Charles Y. Hu Award for Distinguished Service to Mathematics: Lida K. Barrett

Deborah and Franklin Tepper Haimo Awards for Distinguished College or University Teaching of Mathematics: Annalisa Crannell, Kenneth I. Gross, James Morrow

Index of Award Recipients