January 2012 Prizes and Awards

4:25 P.M., Thursday, January 5, 2012

PROGRAM

OPENING REMARKS
Paul Zorn, President
Mathematical Association of America

LEVI L. CONANT PRIZE
American Mathematical Society

ALBERT LEON WHITEMAN 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

M. GWENETH HUMPHREYS AWARD FOR MENTORSHIP OF UNDERGRADUATE WOMEN IN MATHEMATICS
Association for Women in Mathematics

CERTIFICATES FOR MERITORIOUS SERVICE
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

GEORGE DAVID BIRKHOFF PRIZE IN APPLIED MATHEMATICS
American Mathematical Society
Society for Industrial and Applied Mathematics

COMMUNICATIONS AWARD
Joint Policy Board for Mathematics

FRANK NELSON COLE PRIZE IN ALGEBRA
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

LEROY P. STEELE PRIZE FOR LIFETIME ACHIEVEMENT
American Mathematical Society

DEBORAH AND FRANKLIN TEPPER HAIMO AWARDS FOR DISTINGUISHED COLLEGE OR UNIVERSITY TEACHING OF MATHEMATICS
Mathematical Association of America

BECKENBACH BOOK 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
Eric Friedlander, President
American Mathematical Society

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

Persi Diaconis

The Levi L. Conant Prize for 2012 is awarded to Persi Diaconis for his article, "The Markov chain Monte Carlo revolution" (*Bulletin Amer. Math. Soc.* 46 (2009), no. 2, 179–205).

This wonderful article is a lively and engaging overview of modern methods in probability and statistics, and their applications. It opens with a fascinating real-life example: a prison psychologist turns up at Stanford University with encoded messages written by prisoners, and Marc Coram uses the Metropolis algorithm to decrypt them. From there, the article gets even more compelling!

After a highly accessible description of Markov chains from first principles, Diaconis colorfully illustrates many of the applications and venues of these ideas. Along the way, he points to some very interesting mathematics and some fascinating open questions, especially about the running time in concrete situations of the Metropolis algorithm, which is a specific Monte Carlo method for constructing Markov chains. The article also highlights the use of spectral methods to deduce estimates for the length of the chain needed to achieve mixing.

The article is eminently readable, with amply illustrated applications to random permutations and random walks on Cayley graphs, which bring into the picture symmetric function theory, Schur functions, and Jack polynomials. Other examples relate to the connectedness of hard disc arrays, phase transitions in statistical mechanics, and population dynamics with immigration.

Diaconis entertains and educates us at every step of his journey, delightfully convincing us that Markov chains are everywhere. His voice shines through the writing, for example: "I clearly remember my first look at David Wilson's sample of a 2000×2000 Ising model at the critical temperature. I felt like someone seeing Mars for the first time through a telescope."

After providing helpful instructions for how "grown-up" mathematicians can begin to learn about this field, Diaconis concludes his tour with brief descriptions of connections to group representation theory, algebraic geometry, PDEs, chemistry, physics, biology, and computer science. He writes, "To someone working in my part of the world, asking about applications of Markov chain Monte Carlo (MCMC) is a little like asking about applications of the quadratic formula. The results are really used in every aspect of scientific inquiry." His article convinces us that this is so.

Biographical Note

Persi Diaconis graduated from New York's City College in 1971 and earned a Ph.D. in mathematical statistics from Harvard in 1974. He has taught at Stanford, Cornell, and Harvard. An early MacArthur winner, he is a member of the American Academy of Arts and Sciences, the U.S. National Academy, and the American Philosophical Society. He is always trying to play down his 10 years as a professional magician.

Response from Persi Diaconis

As a regular reader of expository articles, I am thrilled that mine seemed useful. The *Bulletin* does a great service with these. While I have the chance, I want to point to two other recent *Bulletin* articles that I am proud of: "Patterns in Eigenvalues" (my Gibbs lecture, 2002) and "On Adding a List of Numbers (and Other One-dependent Determinental Processes)" (with A. Borodin and J. Fulman, 2009). I promise to keep at it. Thank you.

Albert Leon Whiteman Memorial Prize

This prize was established in 1998 using funds donated by Mrs. Sally Whiteman in memory of her husband, the late Albert Leon Whiteman. Mrs. Whiteman requested that the prize be established for notable exposition on the history of mathematics. Ideas expressed and new understandings embodied in the exposition awarded the Whiteman Prize will be expected to reflect exceptional mathematical scholarship. The prize is awarded every three years at the Joint Mathematics Meetings.

Citation

Joseph Warren Dauben

The American Mathematical Society is pleased to award the Albert Leon Whiteman Prize to Joseph Warren Dauben for his contributions to the history of Western and Chinese mathematics, and for deepening and broadening the international mathematical community's awareness and understanding of its history and culture. "In truth mathematics can be called the Pleasure Garden of the myriad forms, the Erudite Ocean of the Hundred Schools of Philosophy," said the 16th-century mathematician Xu Guangqi. Joe Dauben's work illuminates his epigram.

Dauben's first book, *Georg Cantor*: *His Mathematics and the Philosophy of the Infinite* (Harvard University Press, Cambridge, MA, 1979; reprinted, Princeton University Press, Princeton, 1990), is a clear, readable, detailed, richly textured history of Cantor's development of transfinite numbers and, at the same time, an insightful but nonreductive account of the complex and difficult personality that brought this revolution about. His second biography, *Abraham Robinson*: *The Creation of Nonstandard Analysis, A Personal and Mathematical Odyssey* (Princeton University Press, Princeton, 1995), is another near-impossible feat of scholarship and exposition. Dauben traces Robinson's nonstandard path from his birthplace in Germany to his death in New Haven, via Palestine, Paris, London, Toronto, Jerusalem, and Los Angeles, again intertwining the mathematician and his mathematics.

While writing *Abraham Robinson*, Dauben began a study of "Ten Classics of Ancient Chinese Mathematics," a 656 CE edition of texts taught throughout Chinese history, in order to relate them to early Western mathematics and make them understandable to the modern reader. "Chinese Mathematics," his contribution to *The Mathematics of Egypt, Mesopotamia, China, India, and Islam* (Princeton University Press, Princeton, 2007), is the fruit of twenty years of scholarship and, at nearly 200 pages, is a book in its own right. Dauben studies the history of modern Chinese mathematics as well; see, for example, his chapter "Modern

Science Emerges in China" in *Mathematics Unbound: The Evolution of an International Mathematical Research Community*, 1800–1945 (History of Mathematics, 23 (Karen Hunger Parshall and Adrian L. Rice, editors), American Mathematical Society, Providence, RI; London Mathematical Society, London, 2002). He is an elected Honorary Professor of the Institute for the History of Natural Science (a branch of the Chinese Academy of Sciences) and lectures there regularly.

In *Writing the History of Mathematics: Its Historical Development* (Sci. Networks Hist. Stud., 27, Birkhäuser, Basel, 2002), Dauben and co-editor Christoph Scriba engage historians of mathematics around the world to show how the practice of writing history of mathematics has varied from country to country and era to era, and how this historiography is intertwined with the philosophical, scientific, and industrial demands of time and place. In the United States, the history of mathematics, once an excellent but eclectic collection of teaching tools and post-retirement projects, has in the last decades become an integral component of the mathematical community, with well-attended sessions at major meetings. Joe Dauben has spurred this professionalism by his scholarly example and through his service to the profession, which includes organizing international workshops and symposia and editing *Historia Mathematica* for a decade.

Like his list of published articles, the list of Joe Dauben's honors is long. We are proud to add the Whiteman Prize to it.

Biographical Note

Joseph W. Dauben is Distinguished Professor of History and the History of Science at Herbert H. Lehman College and a member of the Ph.D. Program in History at the Graduate Center of the City University of New York. He is a fellow of the New York Academy of Sciences, a *membre effectif* of the International Academy of History of Science, a corresponding member of the German Academy of Sciences Leopoldina, and a member of the Society of Fellows of the American Academy in Rome. He has been editor of *Historia Mathematica*, an international journal for the history of mathematics, and chairman of the International Commission on the History of Mathematics. He is the author of *Georg Cantor, His Mathematics and Philosophy of the Infinite* (Harvard University Press, Cambridge, MA, 1979; reprinted, Princeton University Press, Princeton,1990), and *Abraham Robinson: The Creation of Nonstandard Analysis, a Personal and Mathematical Odyssey* (Princeton University Press, Princeton, 1995), both of which have been translated into Chinese. Among his most recent publications is the monographic study of one of the most ancient works of Chinese mathematics, "算數書 *Suan shu shu*. A Book on Numbers and Computations. English Translation with Commentary", (*Archive for History of Exact Sciences*, 62 (2008), no. 2, 91–178).

A graduate of Claremont McKenna College, magna cum laude, in mathematics, and Harvard University (A.M. and Ph.D.) in history of science, Dauben has been a member of the Institute for Advanced Study (Princeton) and Clare Hall (Cambridge University), where he was affiliated with the Needham Research Institute. He has been the recipient of a Guggenheim Fellowship, Senior NEH and ACLS Fellowships, and was named Outstanding Teacher of the Year at

Lehman College in 1986. He is an honorary member of the Institute for History of Natural Sciences of the Chinese Academy of Sciences, where he was the Zhu Kezhen Visiting Professor in spring of 2005. In 2010 he was Visiting Research Professor at the Institute for Humanities and Social Sciences at National Chiao-Tung University in Hsinchu (Taiwan).

Response from Joseph Warren Dauben

Albert Leon Whiteman was a mathematician with a passion for number theory and an abiding interest in the history of mathematics. He was Hans Rademacher's first student at the University of Pennsylvania, and a Benjamin Peirce instructor at Harvard before taking up a position in 1948 at the University of Southern California, where he spent the rest of his career. I might have been one of his graduate students, for USC was one of the universities where I was accepted to continue as a graduate student in mathematics after I had completed my undergraduate degree in 1966 at Claremont McKenna College in southern California. I had studied mathematics there with John Ferling, Granville Henry, and Janet Myhre, and wrote my senior thesis, which later would prove to be especially useful as it turned out, on nonstandard analysis. Ferling had himself been a student at USC and was the reason I had applied there as one of my choices for graduate school.

But having grown up in southern California, the offer Harvard made to pursue my doctorate there in History of Science proved irresistible, and in the fall of 1966 I found myself on the east coast, in Cambridge, where there was a lively if small, but in retrospect, a remarkable concentration of historians of mathematics. The Department for History of Science, one of the first in the country, had just been established, and I was among the earliest groups to join the new department, along with my friend, colleague, and fellow historian of mathematics, Wilbur Knorr. Wilbur and I were very fortunate to have been trained by, among others, John Murdoch and Judith Grabiner, who prepared us with tutorials for just the two of us for our oral examinations prior to working on our Ph.D.s, which I did under the direction of Erwin Hiebert and Dirk Struik. While at Harvard, I was also fortunate to have worked with Richard Brauer, who took an interest in my thesis on Cantor and whose own memories of mathematics in Germany were always helpful to me in getting the historical sense of the times in which Cantor had lived, especially his later years, right. If Brauer said something I had written sounded correct to him, I felt it must be pretty close to the mark. Later, another Harvard mathematician, Garrett Birkhoff, would likewise prove very helpful when the subject of my research turned to a biography of Abraham Robinson. Birkhoff had known Robinson and was interested in the historical implications of nonstandard analysis. Wim Luxumburg at Caltech and George Seligman at Yale were also colleagues and good friends of Robinson, and likewise mathematicians to whom I am grateful for their reading of the history I was writing.

This is all by way of saying that for historians of mathematics, our best audiences and most valuable collaborators are our mathematician colleagues. In the course of my career as an historian of mathematics, I have also learned the craft

from many of my colleagues who have been both inspirational and supportive. I was indeed fortunate to have several of what in Germany is the *Doktorvater*, beginning with my mentor at Harvard, I. Bernard Cohen, whose own interest in history of mathematics included the work of Isaac Newton, but also the great revolution in computers that led him to serve as IBM's chief historical consultant. That led to several summers when both Wilbur Knorr and I, among a number of graduate students, were employed to work for IBM on a massive history of computing database that Cohen was overseeing.

In Berlin, when I was there for a year doing archival research for my dissertation on Georg Cantor and the origins of transfinite set theory, Kurt R. Biermann, Director of the Alexander von Humboldt Forschungsstelle at the Deutsche Akademie der Wissenschaften in what was then East Berlin, took me under his wing, as did Herbert Meschkowski at the Freie Universität and Christoph Scriba at the Technische Universität in West Berlin. The German circle of historians of mathematics kindly invited me to their annual meetings at the Mathematisches Forschungsinstitut at Oberwolfach in the Black Forest, where Joseph Ehrenfried Hofmann, especially known for his research on Leibniz, had established the Problemgeschichte der Mathematik seminars, and over the years meetings there with Christoph Scriba, Menso Folkerts, Ivo Schneider, Eberhard Knobloch, Herbert Mehrtens, among many others, introduced me to the grand tradition of history of mathematics in Germany. Later Christoph Scriba and I would codirect, with Hans Wußing and Jeanne Peiffer, a group project for the International Commission of the History of Mathematics that resulted in a collaborative historiographic study bringing colleagues from literally all parts of the world together to write a history of the discipline. Also among those to whom I owe so much, beginning with the help and encouragement he offered me as a graduate student, is Ivor Grattan-Guinness, whose own early work on Georg Cantor proved extremely helpful to me, especially through the strategic suggestions Ivor was willing to offer at the time to a fledgling graduate student, but over the years since his critical and editorial eye has always been welcome, as too the various projects on which we have worked together.

In fact, throughout my career, working with mathematicians and historians in different parts of the world has been the most rewarding and inspirational aspect of collaborative research. This has certainly been true of the undertaking I began nearly twenty-five years ago, in 1988, when I was invited to spend six months in China under a program jointly sponsored by the Chinese Academy of Sciences and the U.S. National Academy of Sciences. I spent several months that spring in Beijing at the Institute for History of Natural Sciences, where I joined the seminar on history of Chinese mathematics being taught by Du Shiran. It was there that I met Guo Shuchun and Liu Dun, two historians of mathematics who, along with Lam Lay Yong in Singapore and Horng Wann-Sheng in Taiwan, have also been those from whom I have learned the history of Chinese mathematics.

Wann-Sheng, in fact, not long after I returned to New York from Beijing, was the first of my Chinese graduate students, and the other joy of teaching is the opportunity it provides for working with especially able students. Although I have

not had many graduate students, those with whom I have worked have been a pleasure to mentor, and in the process, I am convinced that I learn as much from them as I hope they have learned from working with me. The first student to find his way to New York for a second doctorate in history of science after having already completed a Ph.D. in mathematics was David Rowe, then Horng Wann-Sheng, and most recently, Xu Yibao. At the moment, I have yet another graduate student from Taiwan, Chang Ping-Ying, who is working on a history of the 算學 Suanxue (College of Mathematics) in the 欽天監 Qintianjian (Bureau of Astronomy) in the early Qing Dynasty, a reminder of the fact that in virtually all cultures in all parts of the world, mathematicians have significant roles to play, not just in the advancement of the theoretical understanding of the subject, but in a wide variety of applications.

In addition to the very great extent to which the American Mathematical Society and the Mathematical Association of America have furthered the history of mathematics through the invited sessions on history which usually run a full two days at the annual joint meetings (for which over the years I've served as co-organizer with, at various times, David Zitarelli, Karen Parshall, Victor Katz, Patti Hunter, and Deborah Kent), the History of Science Society in recent years has also shown increasing interest in history of mathematics. There Karen Parshall and Albert Lewis have been instrumental, along with support offered by Harry Lucas, in establishing a Forum of the History of Mathematics that we hope will serve to increase further the prominence of history of mathematics at HSS annual meetings.

In retrospect, I have much to be thankful for in a career that has brought me into touch with mathematicians and historians the world over, many of whom I consider not just colleagues but good friends, including the students I have been privileged to have at the Graduate Center of the City University of New York. But it is my home institution, Herbert H. Lehman College, to which I must say a special thank-you for the resources and encouragement it gives to faculty, especially for their research and participation in conferences and projects involving the larger academic community of scholars. It was Lehman that gave financial support and released time from teaching when Esther Phillips and I served as editors of *Historia Mathematica* following the sudden and unexpected death of its founding editor, Kenneth O. May. More recently, Lehman helped make possible a year at the Research Center for Humanities and Social Sciences at National Chiao-Tung University in Hsinchu, Taiwan. There, with few obligations apart from my own research, I spent all of 2010 completing a translation with critical commentary of the *Nine Chapters on the Art of Mathematics* (one of the *Ten Classics of Ancient Mathematics*). The *Nine Chapters,* including its commentaries, is the compendium of mathematics from ancient China on which I have been fortunate to work with my colleagues Guo Shuchun in Beijing and Xu Yibao in New York. This collaborative effort would not have been possible were it not for the joint support of the City University of New York, Chiao-Tung University in Taiwan, and the Institute for History of Natural Sciences in Beijing.

What sets the history of mathematics apart from the history of science generally is that it is not an arcane history about past theories that have been discarded, forgotten as failed attempts to understand the workings of nature, but instead the history of mathematics is a living history. In the nineteenth century Weierstraß recommended that his students read the classics of the past, for such works might well contain ideas and methods that could still prove useful, even inspirational, to current mathematical research on the frontiers of the subject. It is for this reason that mathematicians, more than any other practitioners among the sciences, have a very real interest in their history—not just to remember the past, but to use it. For the tangible support and visibility that awards like the Whiteman Memorial Prize provide for the subject, historians of mathematics can truly be grateful, and at this moment in particular, none more than I. To the AMS Council and to the members of the selection committee, I want to express my sincere appreciation, and on behalf of historians of mathematics everywhere, my heartfelt thanks as well to Mrs. Sally Whiteman for establishing this outstanding memorial for her husband, Albert Leon Whiteman.

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

William McCallum

William McCallum is University Distinguished Professor and Head of the Mathematics Department at the University of Arizona. In recent years, McCallum has shown extraordinary energy in promoting improvement of mathematics education, and he has been almost ubiquitous in organizations devoted to mathematics education. He has served as chair of the Committee on Education of the AMS and as chair of CBMS. He is a member of the International Design Committee for the Klein Project, an effort of the International Commission on Mathematics Instruction and the International Mathematical Union to produce a set of narratives or "vignettes" about contemporary mathematics to educate and inspire today's high school teachers in the way that Felix Klein's lectures and books on "Elementary Mathematics from an Advanced Standpoint" did 100 years ago. He has also been Principal Investigator on a Mathematics and Science Partnership grant.

However, his most significant recent activities have also been the most distinctive. He is the founding Director of the Institute for Mathematics and Education (IME) at the University of Arizona and is currently director of its Advisory Committee. This Institute was founded explicitly on the principle that to deal effectively with issues of mathematics education requires communication and cooperation among teachers, mathematics education researchers, and mathematicians. In dozens of events over the past five years, many people from all three groups have met for mutually productive activities under the auspices of IME.

Most recently, he was one member of the three person writing team selected by the Council of Chief State School Officers and the National Governors Association to orchestrate and execute the production of the Common Core State Mathematics Standards. As such, he was the principal representative of the mathematics research community in the creation of the CCSS. The happy fact that so many mathematicians can read these standards with approval can be attributed in considerable part to his involvement.

Biographical Note

William McCallum was born in Sydney, Australia, and received his Ph.D. in mathematics from Harvard University in 1984, under the supervision of Barry Mazur. He has taught at the University of California, Berkeley, and the University of Arizona, where he is currently University Distinguished Professor. He is a founding member of the Harvard Calculus Consortium, and been a research fellow at the Mathematical Sciences Research Institute, the Institut des Haute Études Scientifiques, and the Institute for Advanced Studies. His honors include a Centennial Fellowship from the American Mathematical Society and a Director's Award for Distinguished Teaching Scholars from the National Science Foundation. In 2006 he founded the Institute for Mathematics & Education at the University of Arizona. His professional interests include arithmetical algebraic geometry and mathematics education.

Response from William McCallum

I am deeply honored to receive this award, and accept it not only on my own behalf, but also on behalf of the growing community of mathematicians who have chosen to dedicate their time and intellect to the scholarship of mathematics education. This community includes many previous recipients of this award and many others who deserve similar accolades. I am grateful for their leadership and inspiration. I am also grateful to the many mathematics educators and teachers with whom I have worked, both for their willingness to speak, and for their willingness to listen as I explored their communities. With the Institute for Mathematics & Education I have tried to build a home where mathematicians, educators, and teachers can meet, collaborate, and learn from each other, as I myself have learned from all three groups. I was fortunate to be at the right place at the right time when the Common Core State Standards initiative came along, so that I was able to put my learning to good use. The Common Core is the best chance we have had in a long time to improve school mathematics education in this country; I invite my colleagues in the research community to join the effort to make it succeed.

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. This prize honors Alice T. Schafer (1915–2009), one of the founders of AWM and its second president, who contributed greatly to the advancement of 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 twenty-second annual Alice T. Schafer Prize to **Fan Wei**, Massachusetts Institute of Technology.

Additionally, the accomplishments of three outstanding young women, all senior mathematics majors, were recognized on Wednesday, January 4, 2012. AWM was pleased to honor **Jennifer Iglesias**, Harvey Mudd College, as **runner-up** for the 2012 Schafer prize competition. **Victoria Akin**, University of Georgia, and **Meng Guo**, University of Illinois at Urbana-Champaign, were recognized as **honorable mention** recipients in the Schafer prize competition. Their citations are available from the AWM.

Citation

Fan Wei

Fan Wei is a senior at MIT who distinguished herself both by her outstanding coursework and by the excellence and unusually broad range of her research. She has authored or co-authored five upcoming papers in fields as diverse as Number Theory, Combinatorics, Statistics, and Tropical Geometry. She has participated in multiple undergraduate research projects at MIT and in two summer REU programs. Of the latter, the first was at Williams College (Summer 2010), where she co-wrote a paper investigating the properties of Rikuna polynomials. The second one was at University of Minnesota–Twin Cities (Summer 2011), where she produced two papers: one on a connection between the evacuation of Young tableaux and chip-firing, and the second on tropical properties for general chain graphs. The latter paper is single authored.

Fan has already presented her results at two conferences: *Young Mathematician's Conference*, Ohio State University, 2010, and *Permutation Patterns*, Dartmouth College, 2010. Her work is being described as "elegant," "intricate," "very creative," "quite surprising," and "having stirred up a lot of interest [in the area]." According to her mentors, she is expected to have a very successful career as a research mathematician because "she learns very quickly" and has "an excellent instinct for seeing what needs to be done and then doing it."

In addition to her varied research projects, her coursework at MIT is absolutely outstanding: she has earned the top grade in 21 advanced mathematics courses, five of which were at graduate level. Her MIT instructors describe her as "incredibly bright," "truly outstanding," "one of the best students I have ever had in the course," and "destined to excel."

Aside from her research and coursework, Fan was part of a Meritorious Winner Team for the Mathematical Contest in Modeling (2010), she is a mentor for the Girl's Angle Math Club in Cambridge, and she has served on the board of MIT's Society of Women Engineers.

For her outstanding research abilities, as well as the breadth of her research interests, the excellence of her academic work, and the service she provides to the mathematical community, Fan Wei is the winner of the 2012 Alice T. Schafer Prize.

Response from Fan Wei

I am very honored and grateful to receive the Alice T. Schafer Prize. It is a great encouragement for me and I would like to thank AWM for providing this award.

First and foremost, I want to thank my parents for their constant love, understanding, and tolerance. My home has always been and will continue to be my motivation. My gratitude goes to my mentor and nominator, Richard Dudley. His meticulous research style is exemplary of the rigor of mathematics, and he continues to inspire me. I want to thank my first research supervisor, Richard Stanley, for introducing me to the world of mathematical research. Furthermore, I want to express my gratitude to the hosts of UMN REU—Gregg Musiker, Victor Reiner, and Pavlo Pylyavskyy—and the hosts of Williams College SMALL REU, especially Allison Pacelli, for providing me with two memorable summers. I am also grateful to the MIT math department, especially Professor Artin, Professor Edelman, and Professor Kim for their great help, patience, and support. Lastly, I want to thank all my friends for giving me a second family. I am lucky to know all of them.

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

Bonnie Gold

It is a great pleasure to present the 2012 Louise Hay Award to Bonnie Gold for her long career of dedicated service to mathematics and mathematics education. Trained in mathematical logic (Ph.D., Cornell University, 1976), Bonnie found her true calling not only in teaching university level mathematics but also in writing about and working for mathematics and mathematics education in the areas of assessment and philosophy of mathematics, in developing and directing New Jersey's Project NExT (New Experiences in Teaching), and in serving as the founding Chair of the Special Interest Group of the Mathematical Association of America (MAA) on the Philosophy of Mathematics (POMSIGMAA).

Bonnie has won local and MAA Section teaching awards, has served as Chair of two very different mathematics departments, and has developed a huge variety of courses, ranging from calculus for the biological sciences to Platonic Dialogues as Drama. Her publication contributions are similarly wide ranging: from co-editing books on *Assessment Practices in Undergraduate Mathematics* and *Proof and Other Dilemmas: Mathematics and Philosophy* to contributing articles to a variety of MAA publications to writing insightful reviews of numerous books on mathematical philosophy.

Bonnie has given generously and extensively of her time to professional service. In addition to Project NExT and POMSIGMAA, she has served on and chaired MAA committees ranging from the Committee on Assessment to the Coordinating Council for Education and the Committee on the Teaching of Undergraduate Mathematics.

Roger Simon writes eloquently of the "very high standards of quality and thoroughness" that Bonnie brings to all she does. He notes that she has been an outstanding teacher of mathematics, a department chair of two very different departments, a "sustained contributor of service" to the profession, and a "leader in developing departmental assessment techniques," noting that "Louise Hay's career had the same kind of highlights." He goes on to note that her professional work with POMSIGMAA has resulted in "sustained, effective efforts to rekindle mathematicians' interests in the philosophy of mathematics." She has done all this with two major motivations: one is "to get many more mathematicians to think about philosophical issues," the other "is that she believes that our understanding of what mathematics is affects the way we teach or should teach."

Bernie Madison writes of Bonnie's enormous "contributions to the assessment of undergraduate mathematics" and of their joint work on the MAA CUPM Subcommittee on Assessment. The resulting volume, *Assessment Practices in Undergraduate Mathematics*, which she co-edited, "placed mathematics well ahead of other disciplines in attention of assessment." He cites Bonnie's "good sense, dogged determination, and intimate understanding of undergraduate mathematics."

Annie Selden's letter of nomination summarizes Bonnie's qualifications: "Bonnie has a very wide variety of professional interests in mathematics, philosophy of mathematics, and mathematics education. She has given unstintingly of her time to professional service. Bonnie's dedication, enthusiasm, and friendliness are always evident in abundance ... She is truly deserving of this award."

Response from Bonnie Gold

I would like to thank the Association for Women in Mathematics, which has done outstanding work, since its founding, publicizing the contributions of women mathematicians to the development of mathematics, as well as encouraging young women mathematicians, for this award. Although the focus of the AWM has primarily been women's research in mathematics, this award recognizes an equally important, though better known, role we play in mathematics, that of training future generations of mathematicians as well as educating the general public about mathematics. I am particularly pleased to receive this award because many of the previous recipients, as well as the person the award is named for, are women I admire and have learned much from—Annie Selden (who nominated me for the award), Pat Kenschaft, and Susanna Epp especially. I feel very honored to join their company. In addition, it combines the influences of both of my parents—my mother, who was a mathematics major at a time when very few women majored in mathematics, and my father, who was a professor of education.

Mentors have been very important to me through my career, and while many have been women, three men should also be thanked for their influence on my work. In the early part of my career, I spent many hours talking with Stanley Tennenbaum, one of my teachers at Rochester, about teaching mathematics, as well as about philosophy, which led to my interest in the philosophy of mathematics. I would never have finished my thesis without the encouragement of my thesis advisor, Michael Morley. Most importantly, Sandford Segal, who was my advisor at Rochester and a lifelong friend, first got me involved in the MAA by nominating me to the Committee on the Teaching of Undergraduate Mathematics. This led to my learning about alternatives to lecturing, as we developed the Source Book for College Mathematics Teaching, and to the development of the Innovative Teaching Exchange, first in UME Trends and later on MAA Online. It also led eventually to my involvement in assessment of undergraduate mathematics. I was initially unenthusiastic about assessment—viewing it as an added administrative burden, as many mathematicians do—but got involved to try to prevent high-stakes testing from becoming the standard at the college level, as it has at the K–12 level. However, thanks to my co-editor, Sandra Keith, I learned about classroom assessment techniques, small activities to learn what your students do and do not understand *before* they fail the test. This has led to a considerable improvement in my students' learning. Participating in the national discussion of teaching mathematics also led me to develop a wide range of new courses at Monmouth to improve our future elementary teachers' background as well as the quantitative literacy of our general education students.

There are several substantial rewards for getting involved in organizations such as the MAA that care about teaching. You get to know and work with some wonderful people, and you also have a chance to have an impact beyond the university you teach at. So, when a junior colleague of mine was not included in one of the first Project NExT cohorts, I started a state version in Indiana, NExT-IN, that did include him and many others who, for one reason or another, were not able to participate in the national project, and then, when I moved to New Jersey, I started NJ-NExT as well. I found little activity at mathematics meetings related to my interest in the philosophy of mathematics (beyond foundations). So when Ed Dubinsky started the first SIGMAA, RUME, I was inspired to start the SIGMAA for the Philosophy of Mathematics—which is sponsoring three major activities at this meeting, and is co-sponsor of a fourth. My point is, if you care about teaching, getting involved in one of the national organizations and helping develop programs to improve the experience of students and faculty is personally rewarding at the same time that it allows you to contribute to society. I am grateful for all the opportunities I have been given, and encourage young faculty to become more involved beyond their own institutions.

M. Gweneth Humphreys Award for Mentorship of Undergraduate Women in Mathematics

This award is named for M. Gweneth Humphreys (1911–2006). Professor Humphreys graduated with honors in mathematics from the University of British Columbia in 1932, earning the prestigious Governor General's Gold Medal at graduation. After receiving her master's degree from Smith College in 1933, Humphreys earned her Ph.D. at age 23 from the University of Chicago in 1935. She taught mathematics to women for her entire career, first at Mount St. Scholastica College, then for several years at Sophie Newcomb College, and finally for over thirty years at Randolph Macon Woman's College. This award, funded by contributions from her former students and colleagues at Randolph-Macon Woman's College, recognizes her commitment to and her profound influence on undergraduate students of mathematics.

Citation

Deanna Haunsperger

In recognition of her outstanding mentoring of undergraduate women in mathematics, the Association for Women in Mathematics (AWM) presents the M. Gweneth Humphreys Award to Professor Deanna Haunsperger of the Department of Mathematics, Carleton College.

Haunsperger's nomination letters describe the amazing community of women in mathematics that she has created and nurtured for many years. She is a dedicated mentor, going out of her way to help young women make connections in the mathematical world.

Together with Stephen Kennedy, Deanna Haunsperger conceived of the Summer Mathematics Program (SMP) to mentor talented women early in their undergraduate studies. They have directed it nearly every summer since 1995, with Deanna playing the primary role in mentoring the participants. This program is different from other mathematics programs for women because it is intended for mathematically talented students in their first or second year of college who are uncertain about their future mathematical trajectory. Many are from small colleges from which few students go on to earn a Ph.D. in mathematics. The program gives these students a community of women who are serious about mathematics, and in the end many pursue graduate studies in mathematics.

Haunsperger has brought her energy and leadership to other projects as well. Colleagues at Carleton credit her with the helping to build and sustain the strong community of math majors there (the number of majors has doubled in the 17

years since her arrival). She served as co-editor of Math Horizons, as Second Vice President of the MAA, and chaired a key strategic planning group on MAA activities for students.

The nomination letter describes Haunsperger's extraordinary efforts, first to connect with each and every student at SMP using devices such as "Deanna Chats" and ultimately to continue to be a mentor, friend, and resource long after the program has ended. "The participants know that throughout the rest of their undergraduate years, during graduate school, and beyond, they can always contact Deanna, and she will encourage, support, and advise them." More than 50 SMP graduates already have Ph.D.s and 50 more are currently in mathematics graduate programs. Her enthusiasm and dedication make the program and community the great success they are.

Five women mathematicians who have been involved with the program at many levels wrote supporting statements for the nomination. They reveal much about Deanna's impact: "Because of her charismatic personality and personal experiences and knowledge regarding graduate school and academia,... she is everyone's first-choice source of advice and guidance." "At a professional meeting she has always taken a moment to introduce me to whoever comes over to greet her (and she knows *everyone*!)"

About the community she's built and nurtured:

"It is difficult to imagine us not knowing one another, and we will forever be grateful to Deanna for the creation of the SMP community as it enabled our close friendships to form."

"Deanna's constant, selfless acts on behalf of cultivating the careers of young women mathematicians have inspired us to dedicate our energy to what she has so naturally taught all of us through her actions—to pass along the same mentoring and opportunities to those around us."

The AWM is pleased to honor Deanna Haunsperger for her wonderful achievements and unwavering efforts over decades in the mentoring of undergraduate women in mathematics, in particular in attracting them into the study of mathematics and creating a thriving community which supports them throughout their mathematical careers.

Response from Deanna Haunsperger

I am deeply honored to receive AWM's M. Gweneth Humphreys Award for Mentoring. I have long known that the AWM recognizes the importance of mentorship; I myself received mentoring when I participated in an AWM graduate student paper session twenty years ago. I appreciate the AWM for supporting the mentoring of young members of our profession, and for giving me this honor.

Mentoring is truly its own reward—the relationships I have formed with current and former students at Carleton and participants in the Carleton College Summer Mathematics Program for Women over the past 20 years have been the most

meaningful part of my career. Stephen Kennedy and I began with a shared vision for a summer program to mentor women in 1995, and, supported by the NSF, NSA, and Carleton College, it has grown into an entire community of nearly 300 women scholars. Some of these women have made our summer program part of their professional careers, and have repeatedly taught for us—Erica Flapan, Karen Brucks, Judy Kennedy, Margaret Robinson, Pam Richardson, Laura Chihara, Katherine Crowley—or are frequent visitors to help mentor the young folks and build this vibrant community—Alissa Crans, Jen Bowen, Karen Lange, Becky Swanson, Della Fenster, Emily Ognacevic, Becky Patrias. All these women, along with other fantastic people too numerous to mention, have made my life richer for knowing them, and to them I am eternally grateful. I am inspired by the women who realize the importance of reaching a hand backwards to mentor younger people as they themselves are scaling new heights.

CERTIFICATES FOR MERITORIOUS SERVICE

Certificates for Meritorious Service are presented, on the recommendation of the Sections of the Association, 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

David Kerr, Florida Section

David Kerr has a long and exemplary record of contributions to the MAA, to the Florida Section, and to Eckerd College, where he has been in the mathematics department for twenty years. He was instrumental in getting students involved in undergraduate research projects at Eckerd, and for several years took a large contingent of students to the annual National Conference on Undergraduate Research to give talks. Today, David brings groups of students to the Section meeting, and has several students presenting there every year.

David has been an MAA member for over twenty years, and has been actively involved in the Florida Section ever since coming to Florida. David has been a member of the Executive Committee of the Section for most of the last 15 years, and he has become one of those individuals who carries the Section's institutional memory. In 1996–97, he first joined the Executive Committee as Vice President for Site Selection. In 2000–01, David was Vice President for Programs, and he brought his penchant for rethinking processes to the organization of the Section meeting. During that year, he proposed and implemented the idea of having a volume of proceedings for the meeting; the proceedings for that year and for three years afterward were in fact printed, largely through his unceasing efforts. He was President of the Section in 2002–03, and served as Governor from 2004–07. After completing his term as Governor, he once again took on the challenging role of Vice President for Programs in 2008–09. He is currently in the middle of a term as Newsletter Editor. David has, for many years, overseen the display and sales of MAA books and materials, and he is the one who carries the display copies to and from each meeting and stores them between meetings. He was the recipient of the Section's Distinguished Teaching Award in 2000, and the Distinguished Service Award in 2009.

Biographical Note

David Kerr received his B.A. from the University of South Florida in Tampa in 1976. After teaching high school for two years and serving a tour in the U.S. Navy, he returned to the University of South Florida as a graduate student in 1983. He completed his M.A. and Ph.D. degrees under the direction of Athanassios Kartsatos. Early in his career, David taught at the University of North Carolina, Asheville and at Western New England College in Springfield, Massa-

chusetts. For the last twenty-one years he has been at Eckerd. David recalls struggling with mathematics in high school, especially Algebra II, and only ended up majoring in mathematics in college because, as he always says, it is a subject he enjoys no matter who is teaching the course. As a graduate student, David was active in the Graduate Assistants Union and successfully lobbied the Florida State Legislature in 1985 to implement tuition waivers for all graduate teaching assistants in the state. At Eckerd, he has served as the Mathematics Discipline Coordinator for the last fifteen years. In addition to the MAA, he has been active in the AAUP at both the local and state levels. David is an accomplished weight lifter on the bench press with a personal record of 325 lbs.

Response from David Kerr

I am very honored to receive this Meritorious Service Award from the MAA. I can actually trace my first exposure to the MAA to the first Friday in March of 1976 when two of my professors, Frank Cleaver and Fred Zerla, encouraged me to make a student presentation at the Florida Section meeting that year. In my talk, I presented several theorems from Landau's *Foundations of Analysis* and, in the talk, I tried to stay consistent with Landau's terminology, but after 20 minutes of uttering the phrase "the successor of 1" I finally lapsed into just saying "2." I remember both Frank and Fred smiling at me from their seats in the corner of the room and nodding that this was "okay." I now feel very honored and pleased to be in their company as both Frank Cleaver and Fred Zerla are past recipients of this award. To the members of the Florida Section, it has been a privilege working with you. Thank you!

Citation

Joe Yanik, Kansas Section

Joe Yanik has been an active member of the Kansas Section for more than twenty years and has served as Secretary/Treasurer since 2006. As Secretary/Treasurer, Joe has been the backbone of the Section leadership, providing a sense of continuity and wisdom that helps keep the Section running smoothly, even as the other officers come and go. Joe cheerfully agrees to serve in any way asked of him, as well as on his own initiative. Joe also serves on the Committee on Sections, which has indirectly benefitted the Kansas Section in several ways. In particular, he recognized a number of ways that our Section could improve, which inspired him to spearhead a review of the Section bylaws ahead of the schedule required by the national office. He chaired the committee that drafted new bylaws that will hopefully be put into place soon. Joe most recently has volunteered to help plan an upcoming joint meeting between the Kansas, Missouri, Iowa, and Nebraska/SE South Dakota Sections. Joe additionally serves the mathematical community as a whole as an award-winning teacher and proponent of using technology to teach mathematics.

With an active member of the MAA such as Joe, it can be difficult to give a complete list of all that he does. Indeed, it is often the unnamed service that makes a difference. Some of Joe's named service to the MAA includes

Associate Editor of LOCI (2010–), Editorial Board Member of the *Journal of Online Mathematics* (2010), Committee on Sections (2009–), and Committee on the Teaching of Undergraduate Mathematics (2006–).

Biographical Note

Joe Yanik was born in Effingham, Illinois, but lived in Melvindale, Michigan, during most of his childhood and in Louisville, Kentucky, during high school. He met his wife, Betsy, in graduate school at the University of Kentucky and they were eventually able to solve the two-body problem when they joined the faculty of Emporia State University in 1990. They have two daughters who, during their formative years, were regular attendees of the national MAA meetings. Joe expects to be best remembered as the father of Elizabeth Yanik and of Mary Yanik.

Response from Joe Yanik

I was really pleased and surprised to hear that I would receive the Kansas Section Meritorious Service award. I have been a member of the Kansas Section for over 20 years, and I really value the opportunity to meet and interact with such terrific people. I always look forward to the annual Section meetings where I can hear what is going on in mathematics in Kansas and reconnect with old friends.

Citation

Ruth Favro, Michigan Section

At Lawrence Tech, Professor Favro has served as the faculty advisor for competitive student events, such as the Lower Michigan Mathematics Competition, the Michigan Autumn Take-Home Challenge, and the Mathematical Contest in Modeling, from 1989 to the present. For the Section, she directed the Michigan Mathematics Prize Competition (MMPC) from 1991–1994, and then served on the Executive Committee for nearly a continuous decade: three years as Secretary/Treasurer (1997–2000); three years as Vice Chair, Chair, and Past Chair (2000–2003); and finally three years as Governor (2004–2007). Additionally, from 1995 to present she has coached the Michigan ARML team (American Regions Math League), each year recruiting from the high school students who participated in the MMPC. At the national level, Professor Favro has been actively involved with committees for the MAA such as the Committee on Local and Regional Competitions (1998–2002), the Committee on Competitions (2002–2006), and the Committee on the Participation of Women (2000–2008, Chair 2002–2006).

In addition to all of this dedicated service, Professor Favro has worked tirelessly at every level to promote greater participation among women in mathematics. At her home institution, she has been regularly involved in the LTU Women's Career Day; for the state she was the co-coordinator of Michigan Area Women and Mathematics from 1995–2000; and she served the national Association of Women in Mathematics (AWM) as a member of the AWM Falconer Lecture Committee from 2004–2010, chairing the committee from 2008–2010. Currently, she serves on the AWM Meetings and Programs Portfolio Committee.

Professor Favro's colleagues recognize the deep impact she has had on mathematics in Michigan through her many activities, and especially her recruitment, advising, coaching, and encouragement of students. She regularly brings LTU students to Section meetings and is constantly involved in coaching groups of students in competitions. Her department chair, David Bindschadler, observes that she has been an outstanding contributor to the LTU mathematics department and the profession in general, noting that she has been extremely effective at being connected to and participating in the broader mathematical community.

Biographical Note

Ruth Favro completed her undergraduate work at Wellesley in Art History and Mathematics. She received her M.S. at New York University–Courant Institute and did further work at Wayne State University. While in NYC she taught at Brooklyn Poly (now NYU–Poly). In Detroit, after a time multitasking with kids, clay, and math, she pursued a full time appointment at Lawrence Tech. Her interests in partial differential equations (PDE), computer graphics, fractals and chaos, and coaching student contests led to developing courses in Math Modeling and Geometry in Art, and many talks to different groups. Outside interests include squash, bicycling, fly-fishing, and travel. Now retired (at least salary-wise), she is still involved in teaching, coaching "mathletes", and outreach. She hopes someday to get back to clay in the context of Math and Art.

Response from Ruth Favro

I am honored and humbled to be selected for this award. I have enjoyed working with so many excellent people in the MAA, in Michigan, and nationally. They have been supportive, and have provided role models for career, leadership, and giving back to the profession.

Listening to John Petro and Hugh Montgomery, seeing Marian Barry and Renate McLaughlin as chairs of the Section before me, working with Toni Carroll on WAM and Bob Messer and John Fink on the ARML team, are just a few examples. My colleagues at Lawrence Tech and the students, too, have been great to work with. In particular, thanks to former chair Bill Arlinghaus for the nudge to direct the MMPC, and to the current chair David Bindschadler for support of my activities both at LTU and in the MAA. And thanks to my husband, Skip, who encouraged me to pursue math and physics back when he was boyfriend status.

Citation

Frank Ford, Northeastern Section

Professor Ford has been an MAA member since 1980, when he first became an assistant professor at Providence College. Not long after, he began contributing to the section. Ford recalls "running a computer demo of something, I don't remember what," at the Fall 1983 Section meeting at Providence College.

Ford pitched in wherever he could through the 1980s and 1990s, and was elected Vice Chair of the Northeastern Section in 1996. He then served as Section Chair from 1997 to 1999, and Past Chair from 1999 to 2001.

While Section Chair, Ford took over the newsletter editor's job with Barry Schiller of Rhode Island College; since 2000, Ford has tackled this job as a solo endeavor. For the past 13 years, Professor Ford has coordinated information for and from the Section, making sure that the membership knew all the details about upcoming Section meetings, and regularly contacting departmental liaisons every semester so that all of the comings and goings of the colleges and universities are known.

More importantly, Professor Ford made sure that the Section membership got to hear from the officers regularly. Each semester, he sends a note to the Section's Executive Committee reminding them that it is their duty to write a message for the newsletter. In this way, Professor Ford has functioned not only as the Section's town crier, but as its moral conscience as well.

When it became apparent that sending out a large paper newsletter was the chief financial drain on the Section's finances, Professor Ford adapted the newsletter to an online format, and instituted an inexpensive "Lite" mailbox version that had the simple facts about the upcoming meeting and a registration form. When the job of webmaster came open, Frank took that on as well.

However, Professor Ford is, above all, true to the mission of the MAA in encouraging his colleagues to be excellent in education, in getting his newer colleagues involved in the Section through giving talks or taking on responsibilities, and especially in promoting public appreciation of mathematics. Toward this end, Professor Ford's other joy is to help arrange Section meetings, serving several times in the past decade as a program chair, as a member of a program committee, or as our genial host.

Biographical Note

Frank Ford, after receiving degrees from Rhode Island College and the University of Kansas, began teaching at Providence College, where he remains. At PC, he was Department Chair for 13 years, Secretary of the Faculty Senate for over 10 years, and President of the Faculty Senate for four years. He is cofounder of the PC High School Computer Programming Contest and has been codirector for its 25+ years. He has been an officer of the Section for over 10 years, and has hosted at least three Section meetings of the MAA and two regional meetings of a computer science conference. He is a lector, lay minister of the Eucharist, money-counter, and trustee of his church. He is in his ninth year as secretary of his local historical society. He enjoys theater, music, museums, crossword puzzles, and visiting historical sites. His life–long quest is to discover the secret of permanent weight loss. If you find it, let him know.

Response from Frank Ford

I am honored to be recognized by the Northeastern Section of the MAA since it is so rich in leadership talent. If I tried to thank people for this honor, I would miss someone, and so I say thank you all for making it so easy to participate in this Section. One person who should be recognized is my departmental secretary, Lynne DeMasi. She is tireless in her work and deserves a part of this award. I hope to remain active in this Section.

Citation

Hortensia Soto-Johnson, Rocky Mountain Section

Hortensia (known as Tensia to MAA members) has a long record of outstanding service to the MAA. Tensia's outstanding leadership as the Section Secretary/Treasurer has provided a pillar of strength for the Section and proved to be pivotal in getting our Section to establish a graduate student session at the Section meetings. Tensia managed to leverage Section resources to provide partial travel support to graduate students at the local research universities, which has resulted in the students recruiting additional peers to attend the Section meeting. The graduate student session has been a great addition to the program and it has also provided a catalyst for other research-based sessions at the Section meeting.

Tensia has served on several national MAA committees (Minicourses, America Conference Center Advisory Board, and the Strategic Planning Working Group on Revenue), has chaired the MAA Web Policies and Procedures Committee and the RUME Committee on Mentoring, and has served on the Board of Governors twice. She has also served on the editorial board for the *MAA FOCUS* and for *MAA Online*, plus she currently serves on the Leitzel Lecture Committee. Tensia has made numerous contributions to the Section and to the MAA, but more importantly it is the quality of her contributions that has made her a valued resource to our Section. Tensia has an outgoing and positive attitude that makes her a joy to work with along with a strong ability to get the job done. In fact, she organized the first Annual Pikes Peak Regional Undergraduate Mathematics Research Conference.

It is fortunate that the timing of this award lends us the opportunity to recognize Tensia for her service as she steps down from the position of Secretary/Treasurer; we look forward to the contributions that she will make in the future.

Biographical Note

Hortensia Soto-Johnson grew up in Western Nebraska where she spent long summer days working on the farm and daydreaming about going to college so she wouldn't have to do manual labor the rest of her life. At that time she thought she would be a big corporate lawyer, even though she always saved her math homework for the last thing because it was like dessert. She didn't know anything about graduate school, until her undergraduate advisor said, "So where are you going to get your Ph.D.?" The daydreaming quickly commenced after she found out what that meant. Hortensia teaches at the University of Northern Colorado training preservice elementary, secondary, and collegiate mathematics teachers. Her favorite pastime is spending time with her family, which includes going back to Nebraska to do manual labor.

Response from Hortensia Soto-Johnson

It is a great honor to receive the Rocky Mountain Section Meritorious Service Award. As a Project NExT Fellow, I learned the value of saying yes to the MAA, both at the National level and Section level. I am fortunate to be in a Section that encourages participation from novice and seasoned professors at two-year institu-

tions to research institutions. It has been and continues to be a joy to serve the MAA, to learn from past leaders, to serve as a role model to others, but the most rewarding part is transforming working relationships into life-long friendships. Thank you to the Rocky Mountain Section Nominating Committee for recommending me for this award.

Citation

Minerva Cordero-Epperson, Texas Section

Minerva Cordero-Epperson is an Associate Professor of Mathematics at the University of Texas at Arlington. Minerva is an active member of the Texas Section of the MAA. Her service to the Section includes serving as a director, Section chair, and chairing the committee to organize the 85th Annual Meeting of the Texas Section. She is known to serve with enthusiasm, creativity, and innovation. For example, she introduced the "Calculus Bowl" competition at the 85th Annual Meeting, which is now a very popular tradition.

At the local level, Minerva is a very popular teacher and an active research advisor to both graduate and undergraduate students. Twice she was awarded Professor of the Year by the Student Chapter of the MAA at her university. Upon arrival at UT Arlington, she initiated the Student Chapter of the MAA, and a year later she was awarded the UT Arlington Outstanding Advisor Award and the Student Chapter received the "Overall Winner" Award among all the UT Arlington organizations. For her excellence in teaching she received the MAA Award for Distinguished College or University Teaching presented by the Texas Section. She also received the University of Texas Regents Award For Distinguished Teaching and is a member of the UT Arlington Academy of Distinguished Teachers. She is involved in several initiatives to increase the number of underrepresented minorities in the mathematical sciences at UT Arlington. For example, through her National Science Foundation Graduate STEM Fellows in K–12 Education (GK–12) grant, she works with several schools in the Arlington area which have a large enrollment of minorities and economically disadvantaged students to bring mathematical research to these schools to motivate students to pursue careers in the mathematical sciences.

Minerva has received an MAA TENSOR-SUMMA grant and has codirected MAA sponsored REU programs for the last four years. Some of her research students have won first place in the Student Presentations Competitions at the Texas Section Meetings.

Minerva is also active at the national level. She was the MAA Governor-At-Large for Minority Interests (2008–2011) and she has served on several national committees, including the Invited Addresses Committee for MathFest 2012, the Invited Addresses Committee for the 2011 Joint Mathematics Meeting, the Committee on Minority Participation in Mathematics (which she currently cochairs), the CUPM Subcommittee on Curriculum Renewal Across the First Two Years, and the Strategic Planning Working Group on Membership. She is currently an Associate Editor of the *American Mathematical Monthly* and serves in the Human Resources Advisory Committee of the Mathematical Sciences Research Institute at Berkeley, CA.

Biographical Note

Minerva Cordero-Epperson is an Associate Professor of Mathematics at the University of Texas at Arlington. She was born and raised in Bayamon, Puerto Rico. As a young girl she always loved and excelled at mathematics, and was blessed with many supportive and encouraging mathematics teachers. She knew at a very young age that she wanted to pursue a career in mathematics. Since there were no Ph.D. programs in mathematics in Puerto Rico at the time, she moved to the United States to pursue her graduate studies. Since then, she has published numerous articles and given talks at national and international conferences on her research in finite geometries. An integral part of her career centers on her devotion to teaching and her dedication to her students. This has been the driving force behind her involvement with the MAA and other organizations that promote students' involvement in the greater mathematical community.

Response from Minerva Cordero-Epperson

I am honored to receive the Texas Section Meritorious Service Award. It has been my pleasure to serve the Texas Section in several capacities, and I care deeply about its continued success. The Texas Section has many dedicated individuals whose contributions have made the Section a vibrant organization that serves the needs of both students and faculty. I have been fortunate to serve alongside many great individuals like Stuart Anderson, the late Jasper Adams, Neal Brand, James Epperson, Kim Childs, Connie Yarema, and Reza Abbasian, whose loyalty and service to the Section continue to inspire me every day.

Euler Book Prize

The Euler Book Prize is awarded annually to the author of an outstanding book about mathematics. The Prize is intended to recognize authors of exceptionally well-written books with a positive impact on the public's view of mathematics and to encourage the writing of such books.

The Euler Prize, established in 2005, is 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

Daina Taimiņa

Crocheting Adventures with Hyperbolic Planes, A. K. Peters, Ltd., Wellesley, MA, 2009.

This book is unlike any previously considered for the Euler Prize. Indeed, it is unlike any book on hyperbolic geometry previously written, and it is in a different universe from any book on crochet previously written. But, when you look at it, the idea makes such perfect sense that it seems inevitable.

Eugenio Beltrami, who in 1868 first modeled the non-Euclidean geometry of Bolyai and Lobachevsky by surfaces of negative curvature, actually toyed with the idea of building such surfaces. He made a small fragment of such a surface out of paper, and the idea was taken up again by William Thurston in the 1970s. But the idea did not take off, let alone reach a wide audience, until Daina Taimiņa wrote this book. By bringing crochet technology to the subject, she makes it easy and fun to construct hyperbolic surfaces that vividly illustrate essential features of non-Euclidean geometry. The book is elegant, from both a visual and mathematical point of view.

Thus, *Crocheting Adventures with Hyperbolic Plane*s is a novel approach to geometry that has brought a whole new audience to mathematics. In this respect it has greater outreach potential than any book we have previously considered. But it is much more than that; it is perfectly capable of standing on its mathematical feet as a clear, rigorous, and beautifully illustrated introduction to hyperbolic geometry. It is truly a book where art, craft, science, and mathematics come together in perfect harmony.

Biographical Note

Before coming to the United States in 1996, Daina Taimiņa taught for twenty years at the University of Latvia. Currently she is an Adjunct Associate Professor of Mathematics at Cornell University. In 1997 she crocheted the first hyperbolic plane for use in a non-Euclidean geometry class. Since then her crocheted geometric models have turned also into fiber art pieces. She has given many public lectures and workshops popularizing mathematics for wide audiences. Her models have appeared in art shows in the U.S., U.K., Ireland, Italy, Belgium, Germany, and her native Latvia. Her idea about crocheting hyperbolic planes was picked up by The Institute For Figuring and turned into the ecological project *Hyperbolic Crochet Coral Reef*, which involves thousands of participants worldwide. Taimiņa's crocheted hyperbolic planes are in the permanent *Textile Collection* of Cooper-Hewitt National Design Museum, the *American Mathematical Model Collection* in the Smithsonian Institutions, the U.S. State Department's *Art in Embassies Collection*, as well as others.

Response from Daina Taimiņa

Paul Halmos argued, "Mathematics is a creative art, and mathematicians should be seen as artists, not number crunchers." It has always been one of my favorite quotes, and I was greatly surprised and deeply honored to learn that I had been selected to receive the Euler prize (established by Paul and Virginia Halmos) exactly for viewing mathematics through art and craft. I was encouraged by a variety of people to write this book, many of whom approached me after my talks and told me that they always wanted to learn more mathematics, but they were scared away by the formality and abstractness of it. When I was in seventh grade my math teacher gave me a little book by Martin Gardner. Reading his book I realized that mathematics is not only strings of formulas or facts to remember, but that it is about many fun things. In writing *Crocheting Adventures with the Hyperbolic Planes*, I hope that maybe many years from now somebody else will be able to say the same about my book.

According to the AAUP, 68% of faculty in American higher education is composed of contingent and visiting faculty. I am accepting this prize in the name of that entire faculty group in hope that their contribution to the education of the next generation will be adequately acknowledged in future. I could not possibly have written this book without the help, support, and advice from other people—too many to list here. I want to thank once more the great team at my publisher, A. K. Peters, and all the reviewers; you gave me much valuable advice that shaped this book. My most heartfelt gratitude goes to David Henderson, my husband, who also acted as my first editor, critic, typesetter, consultant, opponent, and supporter; without you this book simply would not exist, so this award is as much yours as mine.

Chauvenet Prize

The Chauvenet Prize is awarded to the author of an outstanding expository article on a mathematical topic. 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

Dennis DeTurck, Herman Gluck, Daniel Pomerleano, and David Shea Vela-Vick

"The four vertex theorem and its converse," *Notices Amer. Math. Soc.*, 54 (2007), no. 2, 192–207.

The four vertex theorem is a beautiful result in global differential geometry. It says that any smooth simple closed curve in the plane must have at least four "vertices"—local extrema for the curvature function. The vertices of a (noncircular) ellipse, for example, are located where it meets its major and minor axes. The four vertex theorem was proved for convex curves in 1909 by Syamadas Mukhopadhyaya and for general curves in 1912 by Adolf Kneser.

Remarkably, the converse of the four vertex theorem is also true. Any continuous real-valued function on the circle with at least two local maxima and two local minima is the curvature function for some simple closed curve in the plane. The converse was proved for positive functions in 1971 by Herman Gluck and for arbitrary functions in 1997 by Björn Dahlberg.

The authors of this excellent expository article—Dennis DeTurck, Herman Gluck, Daniel Pomerleano, and David Shea Vela-Vick—sketch Robert Osserman's 1985 proof of the four vertex theorem and Dahlberg's proof of the converse. The article ends with some generalizations of the four vertex theorem and biographical sketches of Mukhopadhyaya, Kneser, and Dahlberg.

This carefully crafted survey has enough mathematical details to give the reader a sense of the proofs, but not so many to obscure the big picture. Experts and nonexperts alike are sure to enjoy and understand this well-written and well-illustrated article. It is also a wonderful tribute to Björn Dahlberg, who passed away in early 1998, with his unpublished proof of the full converse still on his desk.

Biographical Notes

Dennis DeTurck received his Ph.D. from Penn in 1980, and after a stint at NYU, he returned to Penn's Mathematics Department. He is now the Dean of the College at Penn and lives with about 500 new friends on its campus in Riepe College House, for whom he bakes innumerable cookies. He can't wait to see what he and his twenty-something sons, Greg and Gary, will be when they're all grown up.

Herman Gluck was born in New York City, brought up in the Bronx, and attended Bronx High School of Science, where he cocaptained the math and tennis teams, and found Doris, the love of his life. Then came NYU, with afternoon sojourns to Columbia and evening sessions at Courant, followed by marriage, graduate school at Princeton (where he worked with Ralph Fox in knot theory), and the birth of their son, Mark. This was followed by a postdoc fellowship year at Berkeley and IAS, four years at Harvard, and the birth of their daughter, Robi. Forty-five years later and counting, Herman is at Penn, surrounded by fabulous colleagues, students, and friends, as well as son-in-law Steve and granddaughters, Mandy and Kamila. A rich-to-bursting life includes tennis competition and voice lessons.

Daniel Pomerleano got his B.A. at the University of Pennsylvania in 2007 and is finishing up his Ph.D. at UC Berkeley studying mathematical physics. He enjoys playing chess and travelling to and living in new destinations, and he looks forward to the continuation of his mathematical journey.

David Shea Vela-Vick was born and raised in Albuquerque, New Mexico. He attended Rice University, where he received his B.A. in mathematics in 2004. It was there that he met his future wife, Monica. From Houston, Shea moved to Philadelphia to attend graduate school at the University of Pennsylvania. In 2009, he received his Ph.D. under the supervision of John B. Etnyre. He commutes to NYC where he is completing his third year as an NSF Postdoctoral Fellow at Columbia University. By day, Shea works on low-dimensional topology/geometry. By night, he changes poopie diapers for his newborn, Austin Lucas.

Joint Response from Dennis DeTurck, Herman Gluck, Daniel Pomerleano, and David Shea Vela-Vick

The award of the Chauvenet Prize has filled us all with great pleasure, and we feel honored that our names will be added to the list of prize winners.

A little detective work has led us to believe that Shea and Daniel are the first to be awarded this prize in its 87-year history for work done as students: this made us smile even more.

Our entire mathematical community owes a debt of gratitude to Vilhelm Adolfsson and Peter Kumlin of Göteborg University in Sweden. Knowing of Björn Dahlberg's work on the converse to the Four Vertex Theorem, they searched

for and found his marvelous unfinished manuscript after his tragic death from meningitis at the age of 48. They worked it over in great detail, edited it, and then shepherded it through to publication.

Our deepest thanks to Monroe Tenner, the very talented artist responsible for the full color picture of eight snakes chasing their tails, which illustrated one of the core arguments in proving the converse to the Four Vertex Theorem.

And finally, special thanks to Sandra Frost, the extraordinary Managing Editor of the *Notices*. Sandy, with artistic talent of her own, produced a version of the eight snakes picture with colors deeper and even more striking than the electronic version we sent her, and then she made a full page glossy of it, superimposed on a watermark of itself.

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 Outstanding 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

John Pardon

John Pardon has been named the recipient of the 2012 Morgan Prize for Outstanding Research by an Undergraduate Student for solving a problem on distortion of knots posed in 1983 by Mikhail Gromov. Demonstrating brilliant geometric understanding, John solved the problem by exhibiting a sequence of torus knots with distortions going to infinity. More precisely, given a smooth (or rectifiable) embedding of a knot K into 3-space, consider the ratios of the intrinsic and extrinsic distances between pairs of distinct points on the knot. The supremum of this ratio over all pairs is the distortion of the embedding. The distortion of a knot K is the infimum of the distortions of all rectifiable curves in the isotopy class of K. John's elegant proof was a beautiful mix of geometry and topology combined with some analytic arguments. John learned about this problem on his own (and in high school). According to his letters of recommendation, with this problem, no one had any idea how to get started; the key insight that cracked this problem is due to John. This paper appeared in the July issue (volume 174, number 1) of the *Annals of Mathematics*.

John has had five papers published with another two submitted, one of which (with János Kollár) resulted from a conversation at a Phi Beta Kappa dinner at which Kollár asked John about a topology problem he had been posing to various topologists for about a year, without success. A week later, John sent Kollár an email with a solution to the problem and they began working together, leading to the paper submitted in April. John's letters of recommendation describe him as very knowledgeable and insightful. John has given talks on his work at the Southeast Geometry Conference at the University of South Carolina, at geometry and topology seminars at City University of New York, Georgia Tech, University of Georgia, as well as at Princeton seminars and conferences.

Biographical Note

John Pardon was raised in Chapel Hill, North Carolina, and began taking mathematics classes at Duke University while he was still in high school at Durham Academy. He was the valedictorian of Princeton's 2011 graduating class, majoring in mathematics. John was also a member of Princeton's winning team in an international Chinese-language debate, having taken Chinese throughout all four years at Princeton. A Phi Beta Kappa, he is also an accomplished cellist, twice winning the Princeton Sinfonia's annual concerto competition; he was a four-year member of the Sinfonia.

John's first paper in mathematics, "On the unfolding of simple closed curves", was submitted to the *Transactions of the American Mathematical Society* in January of his senior year in high school. It was also in high school that one of his favorite pastimes (reading mathematics papers online) introduced him to the problem on distortion of knots posed Gromov, the solution of which brings to him the Morgan Prize. John has received numerous recognitions for his academic achievements; some of these are the Goldwater scholarship, two-time winner of Princeton's Shapiro Prize for academic excellence, and an NSF Graduate Research Scholarship to support his graduate studies at Stanford University, where he is currently.

Response from John Pardon

I am very honored to receive the 2012 Morgan prize. I would like to thank the AMS, MAA, and SIAM for sponsoring the award, and Mrs. Frank Morgan for endowing it.

I am grateful to everyone who has taught me mathematics, especially my dad, for sharing their expertise and enthusiasm.

Thanks are due to David Gabai for helpful discussions about my work on knot distortion, and to János Kollár for sharing and discussing topology problems with me.

Citation for Honorable Mention
Hannah Alpert

Hannah Alpert is recognized with an Honorable Mention for the 2012 Morgan Prize for Outstanding Research by an Undergraduate Student for a body of work consisting of six papers, five of which were published and one submitted prior to her graduation from the University of Chicago in June 2011. The first of these, in terms of her timeline of work, is a joint paper on topological graph theory on which she worked while in high school. Her co-authors on this paper point out that they sent this high school student the remaining cases in the proof that all 6-colorable triangulations of the torus satisfy Grünbaum's Conjecture, cases on which they were stuck. Hannah finished them off quickly and this paper appeared in the *Journal of Graph Theory* early in 2010. An anonymous referee's comment on Hannah's paper "Rank Numbers of Grid Graphs" (*Discrete Math-*

ematics, 2010) says, "The compilation of results forms arguably the best paper on the topic in the last decade." This is one of three professional-level papers she wrote in her 2009 REU at University of Minnesota Duluth.

Rather than exploit her novel approach to ranking numbers (her first paper of the summer of 2009) to obtain more results, Hannah asked for a different topic and successfully extended previous results on phase transitions in countable Abelian groups. She also provided the first results on phase transitions for uncountable Abelian groups and infinite nonabelian groups. She spoke on this work at the Combinatorial and Additive Number Theory conference, which is sponsored by the New York Number Theory Seminar. Hannah had two papers related to tournaments following the Lafayette College REU and a joint paper in *Discrete and Computational Geometry* as a result of the Willamette Valley REU the summer after her first year at University of Chicago.

Biographical Note

Hannah Alpert grew up in Boulder, Colorado, attending Fairview High School. It was in high school that she began her mathematical research that led to a joint paper published in the *Journal of Graph Theory*. Hannah participated in the Hampshire College Summer Studies in Mathematics for three summers and was a MathPath camp counselor the summer before she entered the University of Chicago, from which she graduated in June 2011.

While an undergraduate at Chicago, Hannah participated in three REUs (Willamette Valley, University of Minnesota Duluth, and Lafayette College) and in each of these successfully solved posed problems, resulting in publications in *Discrete and Computational Geometry*, *Discrete Mathematics*, *Integers, and Archiv der Mathematik*. She also participated in the Budapest Semesters in Mathematics. Hannah was recognized at JMM 2009 with an MAA Undergraduate Poster Session Prize. She was awarded the Barry M. Goldwater Scholarship in 2009 and was a winner of the 2010 Alice T. Schafer Prize for Excellence in Mathematics by an Undergraduate Woman. Hannah is in her first year of graduate work at MIT, where she is supported with an NSF Graduate Fellowship.

Response from Hannah Alpert

I am grateful to have been selected for Honorable Mention for the 2012 Morgan Prize. I would like to thank sarah-marie belcastro, Josh Laison, Joe Gallian, Mel Nathanson, and Garth Isaak for the work they have done to facilitate my research.

Citation for Honorable Mention
Elina Robeva

Elina Robeva is recognized with an Honorable Mention for the 2012 Morgan Prize for Outstanding Research by an Undergraduate Student for her work with Sam Payne of Yale University on a new proof of the Brill–Noether Theorem using tropical geometry. Elina began work on the deep and difficult mathematics of Brill–Noether theory during her sophomore year at Stanford; the co-authored

paper "A Tropical Proof of the Brill–Noether Theorem" has been recommended for publication in *Advances in Mathematics*. Elina's letters of recommendation say that without her persistence, independence, and insight, this project would have ended far short of the ultimate goal of a new proof of the Brill–Noether theorem. It is noted that the Brill–Noether theorem is a remarkable result that has spawned an entire subfield of algebraic geometry and that the paper of which Elina is a co-author may reasonably be the most important paper of the year in tropical geometry. Multiple definitive breakthroughs along the way to the new proof were due solely to Elina.

Prior to the Brill–Noether work, Elina proved an elegant formula for the optimal strategy in bidding Hex (where players bid for the right to move, rather than taking turns). Her formula is beyond the computing capacities of contemporary machines; however, Elina developed and implemented a Monte Carlo approximation to this optimal strategy that is available online and is undefeated against human opponents. This work led to a joint paper "Artificial Intelligence for Bidding Hex" that appeared in the volume *Games of No Chance* in December 2008. Elina is referred to by her references as a mature and powerful research mathematician, who is known for her attitude at seeking out challenges and working both hard and wisely. "The essential quality in a mathematician, the willingness to dive into a research problem and not be fearful, is something that Elina has developed at a young age."

Biographical Note

Elina Robeva was born and grew up in Sofia, Bulgaria. Her interest in mathematics developed in middle school through competitions. By the time she graduated from high school, she had won two silver medals in the International Mathematical Olympiad, a gold medal in the Balkan Mathematical Olympiad, and various other awards from national and international competitions. Then she enrolled at Stanford, where she concentrated on theoretical mathematics and research. She graduated in June 2011 and was recognized with a Deans' Award for Academic Accomplishment and a Sterling Award for Scholastic Achievement. The article announcing these awards says that she "devoured the most challenging undergraduate and graduate mathematics courses at Stanford." She also achieved an honorable mention on the 2010 William Lowell Putnam examination and spent a summer at Facebook as a software engineer. Elina is now in her first year of the mathematics Ph.D. program at Harvard.

Response from Elina Robeva

I am very honored to have received this recognition, and I thank the AMS, MAA, and SIAM for selecting me for this award.

I would like to express my gratitude to the people who have had the most impact on my mathematical education thus far. I thank Ravi Vakil for the great support and advice and for all the times when he encouraged me to pursue various challenging mathematical tasks. I thank Sam Payne for being a wonderful research advisor and providing me with really interesting and engaging research problems. I also express my gratitude to Persi Diaconis for his great advice during my time

at Stanford. I thank my high school teacher, Svetla Angelova, and the Bulgarian Academy of Sciences for the great preparation and opportunities to take part in mathematical competitions. Finally, I thank my mother, Rumyana Ivanova, for her unbounded love, support, and patience, which have continuously guided me during my education.

George David Birkhoff Prize in Applied Mathematics

This prize was established in 1967 in honor of Professor George David Birkhoff. The initial endowment was contributed by the Birkhoff family and there have been subsequent additions by others. It is awarded for an outstanding contribution to "applied mathematics in the highest and broadest sense." Currently, the prize is awarded every three years. The award is made jointly by the American Mathematical Society and the Society of Industrial and Applied Mathematics. The recipient must be a member of one of these societies.

Citation

Bjorn Engquist

The 2012 George David Birkhoff Prize in Applied Mathematics is awarded to Bjorn Engquist for his contributions to a wide range of powerful computational methods over more than three decades. These include the numerical analysis of boundary conditions for wave propagation which provided deep understanding about constructing accurate numerical schemes, efficient shock capturing schemes for nonlinear conservation laws which have found their way far beyond fluid mechanics into such disparate fields as image processing and materials, techniques for numerical homogenization, and methods for computing across multiple scales. His work blends mathematical analysis, modeling, and computation, and has led to numerical tools with enormous impact across a broad range of applications, including aerodynamics, acoustics, electromagnetism, computational fluid mechanics, and computational geoscience.

Biographical Note

Bjorn Engquist was born in Stockholm, Sweden, in 1945 and he studied as an undergraduate and graduate student at Uppsala University, where he obtained his Ph.D. in 1975. After two years as a postdoc at Stanford University he joined the faculty at the UCLA Department of Mathematics in 1978. He has been professor at Uppsala University, the Royal Institute of Technology in Stockholm, and Princeton University. At Princeton he was also the director for the program in Applied and Computational Mathematics. Since 2004 he is the CAM Chair I Professor at the University of Texas at Austin and there also director for the Center for Numerical Analysis at the Institute for Computational Engineering and Science. He has supervised 33 Ph.D. students. He was speaker at the International Congresses of Mathematicians in 1982 and 1998 and he has received the first SIAM Prize in Scientific Computing, the Celsius Medal, the Wallmark Prize, a

Guggenheim Fellowship, and recently the Henrici Prize. He is a SIAM Fellow and member of the Royal Swedish Academy of Sciences, the Royal Swedish Academy of Engineering Sciences and a foreign member of the Norwegian Academy of Science and Letters.

Response from Bjorn Engquist

I am deeply honored and delighted to receive the 2012 George David Birkhoff Prize in Applied Mathematics. I greatly appreciate the citation and the recognition from the American Mathematical Society and the Society for Industrial and Applied Mathematics. I have always found computational science, which is at the interface between mathematics and applications, to be an exciting and a fruitful field for research. It is highly rewarding to see mathematical advances impact science and engineering. I am grateful to all collaborators throughout my career. I thank my advisor Heinz-Otto Kreiss for his guidance and insight. I also thank many of my colleagues from the important early years, when I was fortunate to collaborate with Andrew Majda and Stanley Osher, to the present time working with Richard Tsai and Lexing Ying. I am also thankful for the inspiring interaction with my many excellent students from whom I learned at least as much as they from me. Many thanks to Weinan E and Tom Hou from our time at UCLA and beyond and to Olof Runborg and Anna-Karin Tornberg from the time at the Royal Institute of Technology in Stockholm.

JOINT POLICY BOARD FOR MATHEMATICS

Joint Policy Board for Mathematics Communications Award

This award was established by the Joint Policy Board for Mathematics (JPBM) in 1988 to reward and encourage communicators who, on a sustained basis, bring mathematical ideas and information to nonmathematical audiences. Both mathematicians and nonmathematicians are eligible. Currently, the award is made annually. JPBM represents the American Mathematical Society, the American Statistical Association, the Mathematical Association of America, and the Society for Industrial and Applied Mathematics.

Citation

Dana Mackenzie

The 2012 JPBM Communications Award is presented to Dr. Dana Mackenzie.

Over the last 15 years Dr. Mackenzie has produced a remarkably broad and deep body of writing for experts and nonexperts alike. The work focuses largely on mathematics itself, but also touches geology, climate change, astronomy, academic mathematics as a profession, and even the game of chess—at which Dr. Mackenzie competes at the USCF National Master level.

Dr. Mackenzie's authorship of Volumes 6–8 of *What's Happening in the Mathematical Sciences*, published by the American Mathematical Society, illustrates his knowledge, versatility, and expository skill. These lucid, informative, and witty volumes showcase the importance and applicability of up-to-the-moment developments in mathematics, in fields ranging from the geometry of surfaces to signal processing to the history of mathematics in antiquity. When *Science* recognized Grigory Perelman's proof of the Poincaré conjecture as "Breakthrough of the Year" in 2006, Dr. Mackenzie was chosen to write the cover article.

In these and other works, Dr. Mackenzie reveals, celebrates, and illustrates the excitement and vitality of learning, using, and discovering excellent mathematics.

Biographical Note

Dana Mackenzie was born in 1958 and wrote his first book at the age of five. While "The Littlest Inchwarm" (sic) never got past its original limited edition of one copy, it did foreshadow a lifetime love of writing. Mackenzie's love of mathematics also surfaced at an early age. He eagerly read every book by Martin Gardner, discovered the formula for triangular numbers in sixth grade, and discovered that i has a square root in ninth grade. Fortunately, his teachers didn't tell him that these things were already known.

After majoring in mathematics at Swarthmore College, Mackenzie earned his Ph.D. from Princeton University in 1983. He taught for six years at Duke University and seven years at Kenyon College. During that time, he received the 1993 George Pólya Award from the Mathematical Association of America.

In 1996, while surfing the newfangled World Wide Web, Mackenzie found out about the Science Communication Program at the University of California at Santa Cruz. It was another "eureka" moment, as he saw for the first time how to combine his passions for math and writing. The program taught him the ropes of journalism and launched him on a new career as a freelance mathematics and science writer.

Since 1997 Mackenzie has written for such magazines as *Science*, *New Scientist*, *American Scientist*, and *Smithsonian*. His first trade book, *The Big Splat, or How Our Moon Came to Be*, appeared on *Booklist* magazine's best-of list for 2003 and was one of Audible.com's audiobooks of the year for 2010. While he enjoyed writing about other sciences, he still felt his portfolio was incomplete without a book about the subject he knew best. Princeton University Press will publish his first full-length popular book about mathematics, called *The Universe in Zero Words*, in 2012.

Mackenzie still lives in Santa Cruz with his wife, Kay, and an ever-changing array of foster animals.

Response from Dana Mackenzie

I like to tell people that my job gives me the opportunity to get free lessons from the smartest people in the country every week. For someone who likes learning new things, journalism—especially science journalism—is like a never-ending trip to the candy store. I never know what I'm going to turn up next.

Winning the JPBM Communications Award evokes two predictable emotions, which are both sincere in spite of their predictability. First, I am humbled by the list of previous winners. I see names of people who inspired me, such as Martin Gardner, Constance Reid, Ian Stewart, and Sylvia Nasar. I also see people like last year's winners, Nicolas Falacci and Cheryl Heuton, who have done much more than I ever could to bring mathematics to the masses.

The second sincere emotion is gratitude. I would like to thank several people, some well known and others not, without whom this journey would never have happened. Barry Cipra helped me get started in the writing business. Editors like Robert Coontz at *Science* and Brian Hayes and Rosalind Reid at *American Scientist* taught me the craft. John Wilkes had the vision to start the Science Communication Program at UCSC, and gave me the last slot in the class of 1997, when I barely applied before the deadline. Ed Dunne and Jim Maxwell at the American Mathematical Society entrusted me with the *What's Happening in the Mathematical Sciences* series, so well begun by Barry Cipra. And Martin Gardner and George Pólya, neither of whom I ever met, were my greatest inspirations.

Frank Nelson Cole Prize in Algebra

This prize was founded in honor of Frank Nelson Cole on the occasion of his retirement as secretary of the AMS after 25 years of service and as editor-in-chief of the *Bulletin of the American Mathematical Society* for 21 years. The endowment was made by Cole, contributions from Society members, and his son, Charles A. Cole. Prizes are awarded at three-year intervals for contributions to algebra or the theory of numbers.

Citation

Alexander S. Merkurjev

The 2012 Frank Nelson Cole Prize in Algebra is awarded to Alexander S. Merkurjev of the University of California, Los Angeles, for his work on the essential dimension of groups.

The essential dimension of a finite or of an algebraic group G is the smallest number of parameters needed to describe G-actions. For instance, if G is the symmetric group on n letters, this invariant counts the number of parameters needed to specify a field extension of degree n, which is the algebraic form of Hilbert's 13th problem.

Merkurjev's papers ("Canonical p-dimension of algebraic groups" (with N. Karpenko), *Adv. Math.* 205 (2006), no. 2, 410–433; and "Essential dimension of finite p-groups" (with N. Karpenko), *Invent. Math*. 172 (2008), no. 3, 491–508) introduce breakthrough new techniques to compute the essential dimension of p-groups. In his paper "Essential p-dimension of $\mathrm{PGL}(p^2)$" (*Jour. Amer. Math. Soc.* 23 (2010), no. 3, 693–712), which is a *tour de force*, Merkurjev calculates the essential dimension, localized at a prime p, of the group $\mathrm{PGL}(p^2)$, which is bound up with understanding the structure of division algebras of dimension p^4 over general fields.

Merkurjev's unique style combines strength, depth, clarity, and elegance, and his ideas have had broad influence on algebraists over the last three decades.

Biographical Note

Alexander Merkurjev was born on September 25, 1955, in St. Petersburg (Leningrad), Russia. In 1977 he graduated from St. Petersburg University, and he received his Ph.D. there in 1979 under the direction of Anatoly Yakovlev. In 1983 he earned the Doctor of Sciences degree from St. Petersburg University for the work "Norm residue homomorphism of degree two". In 1983 Merkurjev won the Young Mathematician Prize of the St. Petersburg Mathematical Society for his

work on algebraic K-theory. In 1995 he was awarded the Humboldt Prize. In 1977 Merkurjev became a professor at St. Petersburg University. Since 1997 he has been a professor at UCLA.

Merkurjev's interests lie in algebraic K-theory, algebraic groups, algebraic theory of quadratic forms, essential dimension. He was an invited speaker at the International Congress of Mathematicians (Berkeley, 1986). Twice he delivered an invited address at the European Congress of Mathematics (1992, 1996), and he was a plenary speaker in 1996 (Budapest).

Response from Alexander S. Merkurjev

It is a great honor and great pleasure for me to receive the 2012 Frank Nelson Cole Prize in Algebra. I would like to thank the American Mathematical Society and the Selection Committee for awarding the prize to me.

I am very grateful to my teacher Andrei Suslin (he was awarded the Frank Nelson Cole Prize in Algebra in 2000). I also want to thank my parents, family, friends, and colleagues for their help and support over the years.

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 and each is awarded annually. The following citation describes the award for Mathematical Exposition.

Citation

Michael Aschbacher, Richard Lyons, Steve Smith, and Ronald Solomon

The 2012 Leroy P. Steele Prize for Mathematical Exposition is awarded to Michael Aschbacher, Richard Lyons, Steve Smith, and Ronald Solomon for their work, *The classification of finite simple groups: groups of characteristic 2 type*, Mathematical Surveys and Monographs, 172, American Mathematical Society, Providence, RI, 2011. In this paper, the authors, who have done foundational work in the classification of finite simple groups, offer to the general mathematical public an articulate and readable exposition of the classification of characteristic 2 type groups.

Biographical Notes

Michael Aschbacher was born in Little Rock, Arkansas, in 1944. He received his undergraduate degree from Caltech in 1966 and his Ph.D. from the University of Wisconsin in 1969 under the direction of Richard Bruck. He was a postdoctoral fellow at the University of Illinios in 1969–70, and since then he has been at Caltech, where he is the Shaler Arthur Hanisch Professor of Mathematics. He received the Cole Prize in Algebra from the AMS in 1980 and the Rolf Schock Prize from the Royal Swedish Academy of Sciences in 2011. He was an invited speaker at the International Congress of Mathematicians in 1978 and a vice president of the AMS from 1996–98. He is a member of the National Academy of Sciences and the American Academy of Arts and Sciences. Aschbacher's research focuses on the finite simple groups.

Richard Lyons earned his Ph.D. under the supervision of John G. Thompson at the University of Chicago, with a brief stop at the University of Cambridge. At Chicago he had further tutelage from Jon Alperin, Richard Brauer, George Glauberman, Marty Isaacs, and Leonard Scott. He had graduated from Harvard College and had been inspired by the high school teaching of Dr. Beryl E. Hunte. After a J. Willard Gibbs Instructorship at Yale, he joined the faculty of Rutgers, where he began a long-term collaboration with the late Danny Gorenstein, and where he now serves in his fortieth year.

Stephen D. Smith is Professor Emeritus of Mathematics at the University of Illinois at Chicago. He received his S.B. from M.I.T. in 1970, and his D.Phil in 1973 under the supervision of Graham Higman at Oxford (where he was a Rhodes Scholar). He was a Bateman Research Instructor at Caltech from 1973 to 1975, and then moved to UIC as assistant professor, and later associate professor, and professor. He has published mainly in finite group theory, with further interests in combinatorics, algebraic topology, and computer science. In addition to the book cited for this Steele Prize, which was written jointly with Aschbacher, Lyons, and Solomon, he has also published *The Classification of Quasithin Groups* with Michael Aschbacher, *Classifying Spaces of Sporadic Groups* with Dave Benson, and most recently *Subgroup Complexes*.

Smith married Judith L. Baxter in 1980, and has two adult stepchildren.

Ronald Solomon got his love of words from his mother and his love of math from his high school teacher, Blossom Backal. He graduated Queens College (CUNY) in 1968 and earned his Ph.D. at Yale University in 1971, under the supervision of Walter Feit. After a Dickson Instructorship at the University of Chicago and a year at Rutgers University, he joined the faculty of the Ohio State University in 1975. Since 1982, he has been a member of a team, with Danny Gorenstein and Richard Lyons, who wrote a series of volumes (Mathematical Surveys and Monographs, 40.1–40.6, American Mathematical Society, Providence, RI, 1994, 1996, 1998, 1999, 2002, 2005) which presents a substantial portion of the proof of the classification of the finite simple groups. Ron earned an Ohio State Distinguished Teaching Award in 1997 and the Levi L. Conant Prize of the AMS in 2006. He is grateful and proud to be the husband of Rose and the father or Ari and Michael.

Joint Response from Michael Aschbacher, Richard Lyons, Steve Smith, and Ronald Solomon

We are deeply grateful to the Society for honoring us with this Steele Prize for Mathematical Exposition. For decades, Danny Gorenstein was the voice of the Classification Project, providing the community with a vivid narrative of our travails and accomplishments. Unfortunately, he departed this life before the task was completed and the tale fully told. Our book serves in part as a sequel to his 1983 volume, providing a detailed reader's guide to the major papers composing the second ("even") half of the Classification proof; but we have prefaced it with an outline and synopsis of the entire proof, updating Danny's references and giving our personal view of the entire enterprise. In writing a book, it always helps to have a great story to tell, and few mathematical projects have played out on such an epic scale and reached such a gratifying culmination as the Classification of the Finite Simple Groups. We appreciate that, in awarding us this prize, the Society acknowledges the importance of this work.

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 and each is awarded annually. The following citation describes the award for Seminal Contribution to Research.

Citation
William Thurston

The Leroy P. Steele Prize for Seminal Contribution to Research is awarded to William Thurston for his contributions to low dimensional topology, and in particular for a series of highly original papers, starting with "Hyperbolic structures on 3-manifolds. I. Deformation of acylindrical manifolds" (*Ann. of Math. (2)* 124 (1986), no. 2, 203–246), that revolutionized 3-manifold theory. These papers transformed the field from a subfield of combinatorial topology to a web of connections between topology, complex analysis, dynamical systems, and hyperbolic geometry. In addition, Thurston not only gave a complete conjectural picture of all compact 3-manifolds, but in these papers he proved his conjecture for a large class of examples, namely Haken manifolds, which include all compact 3-manifolds with nonempty boundary.

Biographical Note

William P. Thurston was born October 30, 1946, in Washington, D.C., and he received his Ph.D. in Mathematics from the University of California at Berkeley in 1972. He taught at the IAS (1972–1973) and at MIT (1973–1974) before joining the faculty of Princeton University in 1974. Professor Thurston returned to UC-Berkeley, this time as a faculty member, in 1991, and became director of MSRI in 1993. He then taught at UC-Davis from 1996–2003 and accepted a position at Cornell University in 2003, where he holds joint appointments in the Department of Mathematics and the Faculty of Computing and Information Science.

Professor Thurston held an Alfred P. Sloan Foundation Fellowship from 1974–1975; in 1976 he was awarded the AMS Oswald Veblen Geometry Prize for his work on foliations. In 1979 he became the second mathematician ever to receive the Alan T. Waterman Award, and in 1982 Professor Thurston was awarded the Fields Medal. He is a member of the American Academy of Arts and Sciences and the National Academy of Sciences.

Response

I am deeply honored by this recognition from the American Mathematical Society. I have loved mathematics all my life. I felt very lucky when I discovered the mathematical community—local, national and international—starting in graduate school. So the Steele prize, with its long and distinguished history of honoring mathematicians whom I greatly admire, means a lot to me.

The work cited by the Steele Prize focuses on what I called the "geometrization conjecture". When I gradually realized the geometric beauty of 3-manifolds, it was as if a giant whirlwind, far bigger and far stronger than me, had swept me up and taken over my mathematical life. I couldn't escape (admittedly, I didn't even want to escape). At first I glimpsed only parts of the big picture, but little by little it came into focus and the mist blew away. I worked very hard and was able to prove the geometrization conjecture in many important cases, including, in some sense, "almost all" cases. I became completely convinced that the geometrization conjecture is true, but my approaches were extremely difficult, if not impossible, to push through.

I was ecstatic to be able to prove the geometrization conjecture in certain sweeping families of cases, but I was frustrated that my various methods seemed very difficult, if not impossible, to extend to all cases. I became completely convinced that the geometrization theorem was true, but it was frustrating not to have a complete proof. I was very pleased when Grigori Perelman, using very natural methods pioneered by Richard Hamilton (but foreign to my technical expertise) proved the geometrization conjecture in full generality.

I have been very lucky to have a long stream of wonderful students. They and others have built up a thriving mathematical community well versed in geometric structures on 3-manifolds, as well as a other related structures on 3-manifolds, such as taut foliations, tight contact structures, etc. There are still many mysteries to solve in this area. I used to feel that there was certain knowledge and certain ways of thinking that were unique to me. It is very satisfying to have arrived at a stage where this is no longer true—lots of people have picked up on my ways of thought, and many people have proven theorems that I once tried and failed to prove.

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 and each is awarded annually. The following citation describes the award for Lifetime Achievement.

Citation

Ivo M. Babuška

The 2012 Steele Prize for Lifetime Achievement is awarded to Ivo M. Babuška for his many pioneering advances in the numerical solution of partial differential equations over the last half century.

In his work on finite element methods, Babuška has developed and applied mathematics in profound ways to develop, analyze, and validate algorithms which are crucial for computational science and engineering. In so doing, he has helped to define that field, and has had a great impact on the modern world.

A constant characteristic of Babuška's work is the combination of deep and imaginative mathematical analysis with a constant concern for the practical implications of his work for engineering applications. In seminal work of the 1960s and 1970s, he established the mathematical foundations of the finite element method culminating in a monumental and highly influential treatise coauthored with Aziz in 1972. In this early work he established the essential role of stability of Galerkin methods and formulated the discrete inf-sup condition, later to be named the Babuška–Brezzi condition, and developed the approximation theory of finite element spaces. He also introduced many techniques of lasting importance, such as the imposition of Dirichlet boundary conditions through Lagrange multipliers and through penalties, analysis through mesh-dependent norms, the first studies of a posteriori error estimation, and the Babuška–Rheinboldt theory of adaptivity. The Babuška paradox for elastic plates, which shows strikingly that the deformation of a circular elastic plate is not well approximated by the deformation of even a nearly equal polygonal plate, has inspired important developments in mechanics, partial differential equations, and numerical methods.

Babuška is an exceptionally productive author, collaborator, and mentor. He has published over 350 refereed journal articles and 26 books, has had nearly 150 coauthors, and has advised 40 Ph.D. students. An astounding feature of Babuška's

work is how many themes he initiated grew into large and active research fields. In the mid-1970s Babuška was among the pioneers of homogenization, which aims to capture the large scale effects of fine scale features of materials without resolving them. Later he developed generalized finite element methods with J.E. Osborn which sought to capture the influence of subgrid scale features in computational methods, and anticipated a large and currently active branch of research in multiscale numerical methods. In the late 1980s Babuška and collaborators developed the *p*-version of the finite element method, and later the *hp*-method, and developed an elaborate theory for understanding its convergence in the presence of singularities. His important work in dimensional reduction and hierarchical models also dates from this time. In the 1990s, he developed the partition-of-unity finite element method, which led to another large and active area of development on meshless methods. In this century he has led the way to the computation of partial differential equations with uncertain data, and the booming field of uncertainty quantification.

Ivo M. Babuška is among the foremost numerical analysts of all time and a unique leader in applied mathematics. His many contributions have had a lasting impact on mathematics, engineering, science, and industry. The Steele Prize honors him for all of these achievements.

Biographical Note

Ivo Babuška was born 1926 in Prague, Czechoslovakia. He received his civil engineering degree (Ing.) and his Ph.D. degree from the Czech Technical University in Prague. After that he studied mathematics and received a Ph.D. (then called a Candidate of Science, C.Sc., degree as in USSR) and then the Doctorate degree (Doctor of Science, D.Sc.) in mathematics from the Czechoslovak Academy of Sciences. He worked in the Mathematical Institute of the Academy and received the Czechoslovak State Award for his scientific work in 1968.

In 1968 Dr Babuška came to the University of Maryland at College Park as a visiting scientist, where he then became a professor in the mathematics department. He retired from Maryland as Distinguished University Professor in 1995.

Since 1995 he has been a senior scientist of the Institute for Computational Engineering and Sciences and professor of Aerospace Engineering and Engineering Mechanics holding the Robert Trull Chair in Engineering at the University of Texas at Austin. Now half retired, he is still working at the university.

Ivo Babuška received various honors recognizing his contributions. He has been awarded five honorary doctorate degrees, was elected to the U.S. National Academy of Engineering, the European Academy of Sciences, the Engineering Academy of the Czech Republic, and the Learned Society of Czech Republic. He is a fellow of SIAM and ICAM. Asteroid 36060 was named Babuška. He also received various recognitions including the Birkhoff Prize of SIAM and AMS, the ICAM Congress Medal, and the Bolzano Medal.

Response from Ivo Babuška

I am deeply honored to receive the Steele Prize for Lifetime Achievement from the AMS because my work encompasses both mathematics and engineering applications and computations. I was very fortunate that many of my mathematical results are used widely in engineering and practical computations. It is very satisfactory and important to me that my mathematical results are appreciated by both the mathematical and engineering community and they are also used in practice. This was influenced by my combined educations in engineering and mathematics and by my mentors, Professor Faltus in engineering, Professor E. Cech, the well-known topologist, and Professor F. Vycichlo, to whom I am very grateful.

On this occasion, I would like to thank all my scientific collaborators and friends in the mathematics and engineering communities. I cannot list them all, so I will mention here only very few: J. Osborn, J. Whiteman, J. T. Oden, and B. Szabo, and my students with whom I have enjoyed not only doing mathematics but also hiking, skiing, and various excursions and adventures.

Finally, I would like to thank very much the selection committee for this great honor.

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.

Citation

Matthew DeLong

Matthew DeLong is a passionate and reflective teacher who challenges his students, from the math-anxious to the most able, to higher levels of accomplishment. His personal qualities of integrity, creativity, caring, and patience contribute to his ability to connect with students on an individual basis and encourage them to do their best work. He has also become a leader in professional development for collegiate mathematics teaching and in student-centered instruction.

While a Ph.D. student at the University of Michigan, Professor DeLong was the first graduate student put solely in charge of a course of ten sections of precalculus, received the Rackham Pedagogy Award for materials designed to facilitate the pedagogical development of graduate student instructors, and was responsible for helping plan and run the professional development week for graduate students and post-docs.

Professor DeLong is the 2005 recipient of the MAA's Henry L. Alder Award for Distinguished Teaching by a Beginning College or University Faculty Member. At Taylor University, DeLong started and leads the monthly School of Natural and Applied Sciences Educational Issues Seminar, and is Taylor University's first Center for Teaching and Learning Excellence Fellow.

DeLong is dynamic in the classroom and implements progressive and innovative teaching strategies. A typical class session involves students presenting homework solutions, mini-lectures, and group problem solving activities from handouts. He keeps the class moving quickly and on task, while encouraging the students to explore the "why" questions and to understand the mathematics. Students meet in groups outside of class to solve "team homework" problems, and they take turns writing the solutions to these problem sets. DeLong expects

students to read the textbook before class by employing a blog for students to post questions on their reading. DeLong developed a liberal arts general education course at Taylor University that engages students in meaningful activities involving the application of mathematics skills and content as part of real world problem solving.

Professor DeLong has published several articles on student-centered instruction and has given many regional and national professional presentations on teaching mathematics. He also co-authored the MAA book Learning to Teach and Teaching to Learn Mathematics: Resources for Professional Development (MAA Note Series, 57, 2001). This book presents a model for training college mathematics instructors in a collegiate program. Reviews say it "offers a treasure chest of ideas" and that this "high-quality comprehensive resource belongs in every mathematics instructor's hands."

DeLong has led Taylor University's Mathematics Contest Team to a top-three finish seven times in the last ten years of the Indiana Collegiate Mathematics Competition, and he initiated an undergraduate research program at Taylor in which he has supervised students, two of whom have recently had their research published in *Mathematics Magazine*.

Biographical Note

Matt DeLong was raised by a supportive family in rural Indiana, which was the perfect environment for nurturing the varied loves that have remained with him throughout life: family, learning, church, mathematics, music, theater, and sports. Because he was raised by teachers and married into a family of educators, it was probably inevitable that he would become a teacher himself. For this he was prepared by his 1993 B.A. from Northwestern University in mathematics and economics and his 1998 Ph.D. in mathematics from the University of Michigan. Taylor University, a small Christian liberal arts college in Upland, Indiana, has, since 1998, been the perfect place for Matt to grow as a teacher and mathematician. The supportive environment there has also allowed him to maintain a variety of interests, including number theory, knot theory, faculty development, coaching little league sports, singing and conducting sacred choral music, performing and directing in musical theater, and singing in his faculty quartet, *Quadrivium.*

Response from from Matthew DeLong

The list of Haimo winners includes many of my mathematical heroes. Thus, it is incredibly humbling to be added to their ranks. I thank the MAA, not only for this award, but also for its rich professional development culture, particularly Project NExT, that has enhanced my work in many ways. I thank my colleagues in the Taylor Mathematics Department, who nominated me for this award, but more importantly who daily strive for excellence and growth in teaching and serving our students. I am grateful for every one of my students, whose successes and failures have taught me much about teaching and learning. The other most significant impacts on my teaching were my father, who taught me that math is fun and teaching rewarding; Mike Stein of Northwestern, who exemplified excel-

lence in teaching and pointed me to graduate school; Pat Shure of Michigan, who taught me to teach and allowed me to mentor the teaching of others; and my friend and collaborator Dale Winter, from whom I learned much. I am indebted more than I could express to my wife Bonnie for her love and support. I am also grateful for my three wonderful children—Ross, Grace, and Luke—and for the love and joy that they bring to my life. Lastly, I thank The Truth, for all of the above and so much more.

Citation

Susan Loepp

Susan Loepp has a profound influence on her students, challenging them to reach their full potential through high standards and talented encouragement. Her mentoring of a diverse group of students has inspired passion and encouraged many to major in mathematics. She also advises numerous undergraduates to successfully publish research, and has created new courses and a concomitant book.

Professor Loepp received an unprecedented three teaching awards as a graduate student at the University of Texas, Austin, and also the 2007 Alumni Award from her alma mater, Bethel College in Kansas. Her teaching evaluations at Austin, the University of Nebraska, and Williams College shine above most others.

At Williams College, Loepp challenges and encourages a diverse group of students, men and notably women, athletes and scholars, the anxious and the overconfident. Loepp has high standards, assigning both daily and weekly problem sets, about which students have been known to brag how long it took and that they were able to finish. She says "I am passionate about setting high standards for students and then helping them struggle to reach their potential."

Loepp's colleagues write that she exudes energy, interest, confidence, and knowledge; "has a lively, friendly, inviting teaching style, but it's clear that she means business"; that she has the "courage to explore tough/pointless/all student questions, [even] if it [means] departing from her lesson plan"; and that she has an impressive ability to conduct class discussion: "She drew perceptive and eager responses from her students … due, in part, to her engaging them in vital mathematical conversation and exploration. Susan knows the importance of giving the students time to think." Professor Loepp empowers students, connecting with them individually and inspiring mathematical zeal, encouraging many to become mathematics majors. Students are clearly infected by her enthusiasm.

Professor Loepp also guides numerous students in undergraduate research in commutative algebra: she has seven joint papers with undergraduate students, and six additional research papers have been published by her students. She has advised 32 summer research students from across the country in the NSF "SMALL" undergraduate research project, and many of these have given student talks at conferences. A colleague writes, "It is remarkable that Loepp is able to

make this very technical material accessible to undergraduate students. To bring students to the point of producing publishable results is truly incredible." Additionally, Professor Loepp has advised 35 student colloquia at Williams College.

Finally, Professor Loepp has created three courses that emphasize applications: a senior seminar on algebraic error-correcting codes, a course on quantum cryptography (which utilizes a book she cowrote with William K. Wootters), and an applied version of a core requirement in abstract algebra, including encryption on elliptic curves.

Biographical Note

Susan Loepp received a B.A. in mathematics and a B.S. in physics from Bethel College (N. Newton, Kansas) in 1989. She earned her Ph.D. in mathematics from the University of Texas at Austin in 1994. After a two-year postdoctoral position at the University of Nebraska, she joined the faculty at Williams College, where she now holds the rank of professor. Loepp is currently the principal investigator on the Williams College SMALL REU grant, and she has served as the director of the program twice. Her research area is commutative algebra, and she has advised the research of many undergraduate students in that field. Loepp and William K. Wootters, an expert in quantum information theory, are co-authors of the book *Protecting Information: From Classical Error Correction to Quantum Cryptography* (Cambridge University Press, Cambridge, 2006).

Response from Susan Loepp

I am truly honored to be one of the recipients of the 2012 Deborah and Franklin Tepper Haimo award. I am immensely grateful to my colleagues in the mathematics and statistics department at Williams College. Every day, they show by example what it means to be a dedicated teacher and scholar. I am lucky to be surrounded by exceptionally supportive, talented, dynamic, and entertaining colleagues. Olga R. Beaver, in particular, has been a fantastic mentor and role model. The undergraduate students I have taught and advised in research are amazing; I have learned more from them than they from me. My Ph.D. advisor, Raymond C. Heitmann, was the best advisor I could have hoped for. I am also grateful to Arnold M. Wedel from Bethel College and Frank S. Brenneman from Tabor College for their dedication to my undergraduate education and for introducing me to effective and unconventional teaching techniques. Finally, I would like to thank my family and friends for their unwavering support.

Citation

Cynthia Wyels

Cynthia Wyels is committed to student success. She works tirelessly to facilitate student learning, not only for her own students but also for students of her colleagues, students across her university, and students at other universities, including in other countries. Her devotion to supporting learning extends to students of all backgrounds and abilities.

Professor Wyels invests considerable time, creativity, and enthusiasm in developing, employing, and assessing innovative teaching practices. One example is her development of computer laboratory activities that lead students to understand and explore key concepts in a variety of undergraduate mathematics courses. Another example is her creation of in-class worksheets that help students to concentrate on the big picture of mathematical ideas being presented. More recently, Professor Wyels has begun to use "proof portfolios" to track students' abilities to construct complete, correct, and elegant proofs as they progress through their undergraduate studies. Professor Wyels has shared all of her teaching innovations with her departmental colleagues and also more broadly through various MAA conferences and publications.

Providing students with enriching research experiences is a particular passion of Professor Wyels. She has led Research Experiences for Undergraduates programs that have emphasized participation from students in underrepresented groups, particularly native Spanish speakers and first-generation college students. She has regularly donated her own faculty stipend in order to support participation of students from a Mexican university. She has mentored 63 undergraduates in research, including 38 from underrepresented groups, with several of these projects leading to co-authored research papers. Professor Wyels has also led efforts to institutionalize student research on her campus and to create an annual student research symposium.

Professor Wyels' dedication to effective teaching extends across her campus, as does her commitment to providing productive learning environments for all students. She founded the Critical Friends Group at California State University Channel Islands, which colleagues report as having fostered a cultural shift in attitudes toward teaching, especially with regard to supporting students who initially find university culture to be confusing and alienating.

Students and colleagues alike attest to the tremendous influence that Professor Wyels has had as a mentor, not only on their study of mathematics and their careers in mathematics and education, but also for developing their self-confidence, persistence to succeed, and professionalism for handling all situations. Testimonials for Professor Wyels attest to her high standards and meticulousness, and also to her generosity, enthusiasm, kindness, and selflessness.

Biographical Note

Cindy Wyels attributes a love for teaching and an analytical bent to her parents, a teacher and an engineer. She first learned to appreciate mathematics at Pomona College. After earning her Ph.D. at the University of California, Santa Barbara, she took positions at the United States Military Academy and Weber State University, then spent several formative years at California Lutheran University. A growing interest in access to higher education led her to CSU Channel Islands, where she has directed the graduate program since its inception. Over the years she has become more cognizant of the barriers facing students from low income, first generation, and historically underrepresented groups, and has worked more actively to help students overcome whatever barriers they may face. She is an

advocate of undergraduate research and believes it is particularly meaningful for students from nontraditional backgrounds. Her research interests are in combinatorics, most recently in graph pebbling and graph labeling.

Response from from Cynthia Wyels

I am deeply honored and humbled to receive the Haimo Award from the Mathematical Association of America. I gratefully recognize the MAA for many opportunities: professional development programs through which I found mentors and friends who still guide and sustain me; the National REU Program that gave me a start directing REUs for students from underrepresented minorities; and all the workshops, minicourses, conference sessions and panels from which my students and I continue to benefit immensely. The faculty of Pomona College in the early 1980s exemplified the scholar-teacher model: Stan Hales in particular shared his enthusiasm for combinatorics. Joe Gallian and Aparna Higgins inspired hundreds of faculty to engage undergraduates in mathematical research; Aparna became a role model, then a collaborator and a friend. Kathryn Weld and Phil Straffin have been steady friends and mentors, with just the right advice or support when needed. Zsuzsanna Szaniszlo generously offers advice and ideas; Maggy Tomova provides inspiration and joyfully collaborates on what is her "hobby" branch of mathematics. At each stage of my career I've been surrounded by dedicated and caring mathematics faculty, too many to name. I thank my students for all they have taught me, as they've demonstrated time and again that mathematical talent and strength of character are found in every subpopulation, native language, and income level. It is my privilege and joy to work at CSU Channel Islands with so many talented students and brilliant, caring faculty. I particularly rely on the wisdom, humor, and dedication of my colleague Kathryn Leonard, who shares a passion for promoting student success, especially through engaging students in meaningful research.

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

Dan Kalman

Uncommon Mathematical Excursions: Polynomia and Related Realms. The Dolciani Mathematical Expositions, 35. Mathematical Association of America, Washington, D.C., 2009.

Just how interesting can a book be whose only topic is polynomials? It doesn't take long to find out. By page 3, we encounter Lill's ingenious paper-folding technique for visualizing real roots of a polynomial, with an elegant proof based on Horner's method to evaluate a polynomial. Now most mathematicians are vaguely aware of Horner's method, but try to find one who knows Lill's technique, or one that knows that the first mention of Lill's idea in the United States appeared in an 1879 pamphlet by a lieutenant in the Army Corps of Engineers. By Chapter 2 we find that if a cubic $p(x)$ has three noncollinear roots in the complex plane, the unique ellipse inscribed in the triangle formed by those roots has the roots of $p'(x)$ as its foci (Marden's Theorem), and that a polynomial $p(x)$ with positive integer coeffcients is completely determined by the value of $p(1) = b$ and $p(b)$ (think base b). There is much, much more: palindromials, polynomial interpolation, symmetric functions, Newton's identities, and a brief history of Cardano's formula for the roots of a cubic (again, who knew Mark Kac sharpened his teeth at age 15 on his own method of getting Cardano's formula?)

And that is only the first third of the book! The next part covers max/min problems, beginning with a careful analysis of the Lagrange fallacy, then moving on to the Milkmaid problem, rotating ellipses, the ladder-around-the-corner (done with envelopes!), and the old shortest-time path through-or-around a field but with a discontinuous objective function. The last section focuses more on calculus questions, the wonder of elementary functions, and the expansion of the toolbox with special functions to solve, for example, $e^x = cx$.

The exposition is perfect: expansive, relaxed, and detailed (almost nothing is stated without being proved). Although knowledge of calculus is needed, any good undergraduate mathematics major can read the entire book, as could many talented high school students. The book is a goldmine of topics for undergraduate talks.

Biographical Note
Dan Kalman

Dan Kalman has been a member of the mathematics faculty at American University, Washington, DC, since 1993. Prior to that he worked for eight years in the aerospace industry and taught at the University of Wisconsin, Green Bay. Kalman has a B.S. from Harvey Mudd College and a Ph.D. from University of Wisconsin, Madison. He has been a frequent contributor to all of the MAA journals, and has served on the editorial boards of both MAA book series and journals; Uncommon Mathematical Excursions is his second MAA book. Kalman has served the national and regional MAA in several capacities, including a term as associate executive director for programs, as the current governor for the MD-DC-VA section, and as a cast member of MathFest 2011's *MAA—the Musical*. While he delights in word play of all kinds, his propensity for making puns has been grossly exaggerated.

Response from Dan Kalman

It is gratifying and humbling to receive a Beckenbach Book Award. Consider how many truly great books the MAA publishes. Consider, too, the books which have received past Bechanbach awards. By either standard, receiving this award is an incredible honor, for which I am truly grateful.

Writing this book was a long and difficult labor, and at times a very lonely one. At the end, after a second or two of post-publication excitement, I felt like the castaway who has thrown his bottle into the ocean, wondering whether anyone anywhere might read the message it contains. To be sure, the castaway has far greater cause for concern than an MAA author. But they have this in common: neither will get much indication whether their missives have been read or not. Until now, that is!

Luckily for me, I was not alone on that desert island. I had plenty of help before sealing up my bottle. Underwood Dudley, in particular, was a constant source of encouragement, feedback, and insightful editorial advice. In no small measure the quality of the finished product confirms one of Woody's maxims: "the editor is always right." I am happy also to acknowledge the contributions of the Dolciani Expositions editorial board, the MAA production staff, and my wise reader, Maurice Burke. My thanks go to all of them, to the prize committee, and to the MAA for publications and programs that so enrich our professional lives.

Citation

Nathan Carter

Visual Group Theory. Classroom Resource Materials Series. Mathematical Association of America, Washington, D.C., 2009.

Burnside's classic text, *Theory of Groups of Finite Order*, was the first book written on group theory; it begins by defining a group as a collection of operators closed under multiplication and inverses (no associative law). Groups don't just sit there, they do something, they act on something, as permutations or symmetries or isometries. This is where groups come from, and it is the standard viewpoint both of users in physics, geometry, analysis, topology, combinatorics, and also of specialists in permutation groups, representations, and geometric group theory. Unfortunately, this viewpoint is almost absent from present undergraduate textbooks.

Nathan Carter's eye-opening textbook has a mission to fix that. Using a Rubik's Cube as a motivating example, he returns to Burnside's definition, only with "actions" instead of "operators". This is followed by Cayley diagrams to show how a group looks; Dehn's term *grüppenbilder*, or group pictures, was always the better name. Next come motivating examples: symmetries of polygons, crystals, frieze patterns, contra dancing, roots of polynomials. Chapter 4, entitled "Algebra at Last," finishes with the "classic" definition of a group, although the action definition is really the classic one. Lastly, much of the traditional content of an undergraduate text on group theory can be found in Carter's text: the alternating and symmetric groups, abelian groups, subgroups, products, and quotients, homomorphisms, Sylow theory, and a little Galois theory.

The presentation is never traditional. Turn to any page and a figure jumps out: Cayley diagrams, colored multiplication tables, permutations as arrows from letter to letter—even Sylow theory is accompanied by conceptual sketches outlining the proofs. The exposition is breezy and leisurely: theorems are "taken out for a test drive", a proposition "gives us a headstart", a statement is "dense with notation" or "hairy". Steps are explained, proof strategies are analyzed—anything to loosen the seductive (after the fact) but intimidating (before the fact) concision and formality of algebra. The result is a textbook that reads like a conversation. Nathan Carter's *Visual Group Theory* is an original breakthrough that has a chance of transforming a staple of a mathematics major's diet.

Biographical Note

Nathan Carter uses computer science to advance mathematics. He studied both subjects at the University of Scranton and at Indiana University, earning a Ph.D. in mathematical logic in 2004. Besides work in logic, he has written a book on group theory visualization, and done a little work in social network analysis. His open source mathematics software, including packages for group theory visualization, games in formal logic, and a general validation environment for mathematical reasoning, is available at http://www.platosheaven.com.

Response from Nathan Carter

I'm excited and grateful to receive the Beckenbach Award for two reasons, and I'm glad to say that only *one* of the two is a selfish reason. After investing a few years of work in a book project, naturally, an author wants to know if it was worth the effort. Recognition from a respected body such as the MAA answers yes to that question; it tells me that those who know math and math education value my effort. That's the selfish reason, but the other reason is much more important.

I wrote the book to make some fascinating mathematics more accessible, putting all its exciting aspects on display. With this award, the MAA expresses the opinion that this worked; more specifically, that the book is beneficial to students of mathematics. And some students have said so, too. One of my colleagues told me that two of his students picked up the book to thumb through it before the semester and suddenly found themselves actually reading the book. This caught them by surprise because they didn't intend to start reading and had never really read a math textbook before.

Students themselves agreeing with the mathematicians at the MAA that the book engages the reader in learning higher mathematics gives me a much better reason to be thankful: I'm thankful that I contributed something that makes math more enticing. And I'm thankful that the MAA is an organization that, with awards like the Beckenbach Award, values and encourages that same ideal.

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 Yeuh-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

John Ewing

John Ewing received his Ph.D. in mathematics from Brown University in 1971 and, after a two-year post-doctoral appointment at Dartmouth, he joined the mathematics department faculty at Indiana University. John quickly became known on campus not only as a very good teacher and researcher, but also as a team player and leader who worked to improve the department, the campus, and the field of mathematics. At Indiana, John began his administrative career as director of Undergraduate Studies (1978–1980) and later served as chair of the Mathematics Department (1986–1989 and 1992–1995). During this period, while John served as the editor of the *Monthly* and the editor of Graduate Texts at Springer-Verlag, he played a key role in the expansion of the department, the renovation of two department buildings, and the strengthening of the department in both teaching and research. Also, while at Indiana, he published approximately 35 research papers in algebraic topology and related areas, supervised three Ph.D. students, and held visiting positions at the University of Virginia, Newcastle University, and the University of Göttingen.

Outside of Indiana University, John first turned his considerable administrative skills to publication. In addition to work on editorial boards too numerous to list, John served as editor of the *American Mathematical Monthly* (1992–1996) and of the *Mathematical Intelligencer* (1980–1986). While he was editor, these journals were distinguished by articles containing engaging, accessible, and

important mathematics. In 1994, John edited the MAA publication, *A Century of Mathematics Through the Eyes of the Monthly*. Underwood Dudley's review in the *Intelligencer* captures John's editorial style: "This is a rich and fascinating book. It has everything, and everything that it has is delightful, curious, enlightening, engrossing, interesting, informative, funny, stirring, poignant, or some combination of the preceding."

Between 1995 and 2009, John served as Executive Director of the American Mathematical Society. His decisions within the AMS were always guided by a commitment to serve not only the specific interests of the AMS, but also those of the broader mathematical sciences community. John is very much a "big tent" mathematician, always maintaining strong and cordial working relationships with his professional society colleagues, especially at the MAA and SIAM. New joint projects of the time that benefited from the mutual cooperation of the mathematics organizations included public awareness activities and government outreach.

As an example of John's big tent vision, in *Science* in 1997, John called attention to the importance of Project NExT: "By bringing young mathematicians to meetings several years in a row, you show them the value of contacts. Most young mathematicians learn that slowly, over many years, or never learn it at all. Project NExT fellows have it handed to them for free." In 2001 the AMS began funding six Project NExT Fellows per year.

In 1999, an AMS task force produced the influential and no-holds-barred *Towards Excellence: Leading a Mathematics Department in the 21st Century*, which was edited by John and is available at no cost on the Internet. This volume quotes deans who report that mathematics departments tend to be too insular, and it emphasizes the importance of mathematics departments building good relationships with other departments across campus. The MAA's *Guidelines for Programs and Departments in Undergraduate Mathematical Sciences* calls *Towards Excellence* "an excellent reference for a planning and evaluation process," and David Bressoud, Past President of the MAA, calls it "one of the most useful resources for making the case for greater support for curricular and instructional improvement." In 2002, John presented the ideas in *Towards Excellence* at an MAA PREP workshop, *Leading the Academic Department: A Workshop for Chairs of Mathematical Science Departments*.

John is a recognized expert in scholarly publishing and has been a strong, articulate, balanced, and visible voice about the role of professional society publishers in working for the long-term survivability of peer review journals as an essential tool for research and scholarship. He spoke eloquently, effectively, and sensibly at national and international venues on the issues that surround scholarly publishing, especially nonprofit publishers, and wrote an important series of commentaries on the state of publishing in the mathematical sciences.

While he has not been an advocate of totally free access, which he finds unsustainable, John has worked tirelessly to improve access to the mathematical literature. He has been committed to low-cost, high-quality electronic publishing,

with author-friendly copyright policies, and to databases that make an exhaustive literature search possible. The Digital Mathematics Registry, which went online in 2006, is a complete list of digitized publications in the mathematical sciences. The AMS maintains this registry as a public service, which is, itself, in the public domain.

Mathematical Reviews, online through MathSciNet since 1996, is one of the indispensable tools of the working mathematician. John's contributions to the growth and enhancement of *Mathematical Reviews* were substantial. With the advice of the senior *MR* staff and oversight committees, he worked first and foremost setting the agenda for improvements to the database. He is a detailed-oriented person, and so his role was rather direct. He is very knowledgeable on the role of technology in building and serving information. He instituted a pricing scheme with the result that the number of institutions that could subscribe to *MR* doubled in a decade. He arranged for all reviews back to the first issue in 1940 to be digitized. There is no doubt that John was key to moving the project forward to produce the *MR* tools and database that we have today. John chaired the Joint IMU/ICIAM/IMS Committee on Quantitative Assessment of Research Citation Statistics. Their report, a critical analysis of the use and misuse of citation statistics in science, was published as the lead article in *Statistical Science* in 2009. The report was featured in *The Wall Street Journal* and on MathDL.

In 2009, John became president of Math for America. The mission of the nonprofit Math for America is "to improve mathematics education in U.S. public secondary schools by recruiting, training, and retaining outstanding mathematics teachers." When he became president, John said, "After 3 years, roughly 40% of the teachers of mathematics [in U.S. schools] are gone. … You can't sustain a profession if you have that kind of attrition. … What Math for America does is concentrate on that one part of the problem. At the moment, it's bringing through something like 40 to 50 new teachers a year. Our hope is to double that number in the next couple of years" (*Science*, January 2009). Since John became president, Math for America has enlarged to about 420 participants, expanded to new cities, and developed new programs, including one for science teachers. Recently, John has again served on several MAA committees, including the Pólya Lecturer Committee and as chair of the 2010 search committee for the editor of the Monthly.

John has received the following awards: the Lester R. Ford Award, 1975; SERC, Great Britain, Research Fellowship, 1981; SFB fellowship, Federal Republic of Germany (Göttingen), 1984; the first MAA George Pólya Lecturer, 1991–92 and 1992–93; Honorary Doctorate of Science, St. Lawrence University, 1995; the George Pólya Award, 1996; Fellow, American Association for the Advancement of Science, 2005.

Throughout his career, John has been an effective and firm, but gentle, leader. As Jonathan Borwein, a former MAA Governor, wrote about serving with John on the Committee on Electronic Information and Communication (CEIC) of the International Mathematical Union, "John is an enormously hard-working

man—this is not a secret—who wears his remarkable erudition and breadth of knowledge very lightly. He is patient, hard to ruffle, and even harder to alienate. The CEIC was formed with many passionate members; all knowledgeable about some bits of the puzzle. It had only one expert: John Ewing. John's patience and generosity in educating the rest of us about the many pitfalls and subtleties was extraordinary. His care in trying to distinguish his role as committee member from that as AMS Executive Director (which could have made him the eight-hundred pound gorilla on the committee) was remarkable."

Biographical Note

John Ewing's biographical note is included with his citation.

Response from John Ewing

I am genuinely humbled to receive this award. Many past winners are my mathematical heroes—people who left legacies that will endure for decades—and I'm not in the same league. I am pleased to receive the award because the citation emphasizes the importance of a community of mathematicians with diverse interests and goals, which are represented by different organizations. That community spirit is crucial to the health of mathematics, and we should all take pride that our organizations work so well together. And I am grateful both to the MAA for all it does for mathematics and also to my colleagues through the years—at Indiana University, at the AMS, and at Math for America—who share in whatever I have accomplished. Lastly, I am grateful to my wife, who not only supported and encouraged me throughout my career, but amazingly seems to like being around mathematicians.

Summary of Awards

For AMS

Award for Distinguished Public Service: William McCallum

Frank Nelson Cole Prize in Algebra: Alexander S. Merkurjev

Levi L. Conant Prize: Persi Diaconis

Leroy P. Steele Prize for Lifetime Achievement: Ivo Babuška

Leroy P. Steele Prize for Mathematical Exposition: Michael Aschbacher, Richard Lyons, Steve Smith, and Ronald Solomon

Leroy P. Steele Prize for Seminal Contribution to Research: William Thurston

Albert Leon Whiteman Memorial Prize: Joseph Warren Dauben

For AMS-SIAM

George David Birkhoff Prize in Applied Mathematics: Bjorn Engquist

For AMS-MAA-SIAM

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

For AWM

Louise Hay Award for Contributions to Mathematics Education: Bonnie Gold

M. Gweneth Humphreys Award for Mentorship of Undergraduate Women in Mathematics: Deanna Haunsperger

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

For JPBM

Communications Award: Dana Mackenzie

For MAA

Beckenbach Book Prize: Dan Kalman, Nathan Carter

Certificates for Meritorious Service: David Kerr, Joe Yanik, Ruth Favro, Frank Ford, Hortensia Soto-Johnson, Minerva Cordero-Epperson

Chauvenet Prize: Dennis DeTurck, Herman Gluck, Daniel Pomerleano, and David Shea Vela-Vick

Euler Book Prize: Daina Taimiņa

Yueh-Gin Gung and Dr. Charles Y. Hu Award for Distinguished Serviceto Mathematics: John Ewing

Deborah and Franklin Tepper Haimo Awards for Distinguished College or University Teaching of Mathematics: Matthew DeLong, Susan Loepp, Cynthia Wyels

Index of Award Recipients

Michael Aschbacher 43
Ivo Babuška 47
Nathan Carter 58
Minerva Cordero-Epperson 25
Joseph Warren Dauben 3
Matthew DeLong 50
Dennis DeTurck 29
Persi Diaconis 1
Bjorn Engquist 37
John Ewing 60
Ruth Favro 21
Frank Ford 22
Herman Gluck 29
Bonnie Gold 13
Deanna Haunsperger 16
Dan Kalman 56
David Kerr 19
Susan Loepp 52
Richard Lyons 43
Dana Mackenzie 39
William McCallum 9
Alexander S. Merkurjev 41
John Pardon 32
Daniel Pomerleano 29
David Shea Vela-Vick 29
Steve Smith 43
Ronald Solomon 43
Hortensia Soto-Johnson 24
Daina Taimiņa 27
William Thurston 45
Fan Wei 11
Cynthia Wyels 53
Joe Yanik 20