Mathematics People

2004–2005 AMS Centennial Fellowships Awarded

The AMS has awarded two Centennial Fellowships for 2004–2005. The recipients are JINHO BAIK of the University of Michigan and NITU KITCHLOO of Johns Hopkins University. The amount of each fellowship is $60,000. The Centennial Fellows also receive an expense allowance of $1,700 and a complimentary Society membership for one year.

Jinho Baik

Jinho Baik received his Ph.D. in 1999 from the Courant Institute of Mathematical Sciences, New York University, under the direction of Percy Deift. He was a Veblen Instructor at Princeton University and the Institute for Advanced Study during 1999–2002, and an assistant professor at Princeton University during 2002–2003. Since 2002 he has been an assistant professor at the University of Michigan.

Baik has been applying methods from integrable systems to probability, combinatorics, and statistical physics. In particular, asymptotic problems on random matrices, random permutations and orthogonal polynomials, and their interrelations have been his main research interest.

He plans to use the fellowship to visit the Courant Institute of Mathematical Sciences.

Nitu Kitchloo

Nitu Kitchloo received his Ph.D. in 1998 from the Massachusetts Institute of Technology under Haynes Miller. From 1998 to 2001 he was an instructor at Northwestern University, and from 2001 to the present he has been an assistant professor at Johns Hopkins University.

He plans to use his Centennial Fellowship at the University of California, San Diego (where he will assume the position of associate professor in fall 2004), and at Johns Hopkins University.

Kitchloo's research is in the fields of geometry, topology, and homotopy theory. He uses topological methods to study infinite-dimensional objects like loop spaces, loop groups, and Kac-Moody groups. His current interests involve studying the topology of symplectomorphism groups. He is also working on the topology of certain infinite loop spaces arising from spectra related to complex cobordism.

Jinho Baik

Nitu Kitchloo

Please note: Information about the competition for the 2005–2006 AMS Centennial Fellowships will be published in the "Mathematics Opportunities" section of an upcoming issue of the *Notices*.

—Allyn Jackson

Biran Awarded Oberwolfach Prize

PAUL BIRAN of Tel Aviv University has received the 2003 Oberwolfach Prize for outstanding research in geometry and topology, particularly symplectic and algebraic geometry. The prize will be given on July 2, 2004, during the 60th anniversary celebration of the Mathematisches Forschungsinstitut Oberwolfach.

Paul Biran has made fundamental and influential contributions to symplectic topology as well as algebraic

geometry. In his thesis he found a remarkable solution to the symplectic packing problem, i.e. the question of what percentage of the volume of a symplectic 4-manifold can be filled by a symplectic embedding of n disjoint balls of equal size. For small numbers of balls, obstructions have been known since the work of Gromov. Biran proved that full packing is possible for every symplectic 4-manifold provided that the number of balls is sufficiently large. His proof introduces original new techniques in symplectic topology: he showed that every symplectic manifold (with integral symplectic class) can be decomposed into a 2-disk bundle over a symplectic submanifold and an isotropic CW complex (on which the symplectic form vanishes). This structure theorem has many other consequences, such as intersection results for Lagrangian submanifolds (the "Lagrangian barrier" phenomenon discovered by Biran) and new obstructions to Lagrangian embeddings. Biran's work also provides new interconnections between symplectic and algebraic geometry: he was able to use symplectic techniques to obtain new results in algebraic geometry, including his contributions to the Nagata conjecture, and new obstructions for smooth projective varieties to appear as hyperplane sections of any other smooth variety or as sections in a fibration with isolated singularities. In another direction Paul Biran made some important contributions to the theory of periodic orbits of Hamiltonian systems as well as to the new theory of Calabi quasimorphisms on the group of Hamiltonian symplectomorphisms. His work covers a wide range of mathematics and brings together many deep and powerful techniques in symplectic topology, such as Floer homology, pseudoholomorphic curves, Donaldson's theory of symplectic submanifolds and Lefschetz pencils, and Seiberg-Witten invariants.

The Oberwolfach Prize is awarded by the Gesellschaft für Mathematische Forschung e.V. to European mathematicians not older than thirty-five years. The prize recognizes excellent achievements in a specific field of mathematics, which changes each time the prize is given. The prize carries a monetary award of 5,000 euros (approximately US$6,000).

Previous recipients of the Oberwolfach Prize are Peter Kronheimer (topology and geometry, 1991), Jörg Brüdern and Jens Franke (number theory and algebra, 1993), Gero Friesecke and Stefan Sauter (analysis and applied mathematics, 1996), Alice Guionnet (stochastics, 1999), and Luca Trevisan (discrete mathematics, 2000).

—Elaine Kehoe

Veneziano Awarded 2004 Heineman Prize

GABRIELE VENEZIANO of CERN (European Organization for Nuclear Research) has been awarded the Dannie Heineman Prize for Mathematical Physics "for his pioneering discoveries in dual resonance models which, partly through his own efforts, have developed into string theory and a basis for the quantum theory of gravity."

The prize carries a cash award of $7,500 and is presented in recognition of outstanding publications in the field of mathematical physics. The prize was established in 1959 by the Heineman Foundation for Research, Educational, Charitable, and Scientific Purposes, Inc., and is administered jointly by the American Physical Society (APS) and the American Institute of Physics (AIP). The prize is presented annually.

—From an APS announcement

Friedman Wins 2004 Parzen Prize

The Emanuel and Carol Parzen Prize for Statistical Innovation for 2004 has been awarded to JEROME H. FRIEDMAN of Stanford University "for his significant innovations in statistical theory that have transformed practice by the creation of influential software, that have significantly influenced modern computational statistics, and that have provided seminal leadership and statistical foundations to research in data mining and knowledge discovery, machine learning and statistical learning, and nonparametric statistical methods."

The Parzen Prize is awarded in even-numbered years by the Department of Statistics at Texas A&M University to North American statisticians who have made outstanding and influential contributions to the development of applicable and innovative statistical methods. The prize consists of a $1,000 honorarium and travel to College Station, Texas, to present a lecture at the prize ceremony.

—Department of Statistics, Texas A&M University

Holroyd and Benjamini Awarded Rollo Davidson Prizes

The trustees of the Rollo Davidson Trust have awarded two Rollo Davidson Prizes for 2004. ANDER HOLROYD of the University of British Columbia was honored for his "novel contributions to different areas of probability, including percolation in its many forms." ITAI BENJAMINI of the Weizmann Institute, Rehovot, Israel, was honored "for his work across probability, including the analytic and geometric, particularly in the study of random processes associated with graphs."

The prize was established to commemorate the life and work of Rollo Davidson and is awarded to young scientists of outstanding promise and achievements in probability, statistics, and related areas.

—From a Rollo Davidson Trust announcement

Brousseau and Hoyles Receive ICMI Medals

The International Commission on Mathematical Instruction (ICMI), founded in Rome in 1908, has, for the first time in its history, established prizes recognizing outstanding achievement in mathematics education research. The Felix Klein Medal, named for the first president of ICMI (1908–1920), honors a lifetime achievement. The Hans Freudenthal Medal, named for the eighth president of ICMI (1967–1970), recognizes a major cumulative program of research. These awards are to be made in each odd-numbered year, with presentation of the medals and invited addresses by the medalists at the following International Congress on Mathematical Education (ICME).

These awards, which pay tribute to outstanding scholarship in mathematics education, serve not only to encourage the efforts of others but also to contribute to the development, through the public recognition of exemplars, of high standards for the field. The awards represent the judgment of an (anonymous) jury of distinguished scholars of international stature, chaired by Michèle Artigue of the University Paris 7. Presentation of the medals and invited addresses of the medalists will occur at the International Congress of Mathematics Education in Copenhagen in July 2004.

Guy Brousseau

The Felix Klein Medal for 2003 is awarded to GUY BROUSSEAU, professor emeritus of the University Institute for Teacher Education of Aquitaine in Bordeaux. This distinction recognizes the essential contribution Guy Brousseau has made to the development of mathematics education as a scientific field of research through his theoretical and experimental work over four decades, and the sustained effort he has made throughout his professional life to apply the fruits of his research to the mathematics education of both students and teachers.

Born in 1933, Guy Brousseau began his career as an elementary teacher in 1953. In the late 1960s, after graduating in mathematics, he entered the University of Bordeaux. In 1986 he earned a *doctorat d'état* and in 1991 became a full professor at the newly created University Institute for Teacher Education (IUFM) in Bordeaux, where he worked until 1998.

From the early 1970s Guy Brousseau emerged as one of the leading and most original researchers in the new field of mathematics education, convinced on the one hand that this field must be developed as a genuine field of research, with both fundamental and applied dimensions, and on the other hand that it must remain close to the discipline of mathematics. His notable theoretical achievement was the elaboration of the theory of *didactic situations*, a theory that he initiated in the early 1970s and that he has continued to develop with unfailing energy and creativity. At a time when the dominant vision was cognitive, strongly influenced by the Piagetian epistemology, he stressed that what the field needed for its development was not a purely cognitive theory but one allowing us also to understand the social interactions between students, teachers, and knowledge that take place in the classroom and that condition what and how students learn. This is the aim of the theory of didactic situations, which has progressively matured, becoming the impressive and complex theory that it is today. To be sure, this was a collective work, but each time there were substantial advances the critical source was Guy Brousseau.

Although the research Guy Brousseau has inspired currently embraces the entire range of mathematics education from elementary to postsecondary, his major contributions deal with the elementary level, where they cover all mathematical domains, from numbers and geometry to probability. Their production owes much to the COREM (Center for Observation and Research in Mathematics Education), which he created in 1972 and directed until 1997. COREM provided an original organization of the relationships between theoretical and experimental work.

Guy Brousseau is not only an exceptional and inspired researcher in the field, he is also a scholar who has dedicated his life to mathematics education, tirelessly supporting the development of the field, not only in France, but in many countries, supporting new doctoral programs, helping and supervising young international researchers (he supervised more than fifty doctoral theses), and contributing in a vital way to the development of mathematical and didactic knowledge of students and teachers.

Celia Hoyles

The Hans Freudenthal Medal for 2003 is awarded to CELIA HOYLES, professor at the Institute of Education of the University of London, for her seminal research on instructional uses of technology in mathematics education. This distinction recognizes the outstanding contribution that Celia Hoyles has made to research in the domain of technology and mathematics education.

Celia Hoyles studied mathematics at the University of Manchester, winning the Dalton prize for the best first-class degree in mathematics. She began her career as a secondary teacher and then became a lecturer at the Polytechnic of North London. She entered the field of mathematics education research, earning a master's degree and doctorate, and became professor of mathematics education at the Institute of Education, University of London, in 1984.

Her early research in the area of technology and mathematics education, like that of many researchers, began by exploring the potential offered by Logo, and she soon became an international leader in this area. Her book, *Windows on Mathematical Meanings: Learning Cultures and Computers*, coauthored with Richard Noss, inspired major theoretical advances in the field, such as the notions of webbing and situated abstraction, ideas that are well known to researchers irrespective of the specific technologies they are studying. From the mid-1990s her research on technology integrated the new possibilities offered by information and communication technologies as well as the new relationships children develop with technology. As an international leader in the area of

technology and mathematics education, she was recently appointed by the ICMI Executive Committee as cochair of a new ICMI study on this theme.

Celia Hoyles' contribution to research in mathematics education is considerably broader than this focus on technology. Since the mid-1990s she has been involved in two further major areas of research. The first, a series of studies on children's understanding of proof, has pioneered some novel methodological strategies linking quantitative and qualitative approaches that include longitudinal analyses of development. The second area has involved researching the mathematics used at work, and she now co-directs a new project, Techno-Mathematical Literacies in the Workplace, which aims to develop this research by implementing and evaluating some theoretically designed workplace training using a range of new media.

In recent years Celia Hoyles has become increasingly involved in working alongside mathematicians and teachers in policymaking. She was elected chair of the Joint Mathematical Council of the U.K. in October 1999, and she is a member of the Advisory Committee on Mathematics Education (ACME), which speaks for the whole of the mathematics community to the government on policy matters related to mathematics education, from primary to higher education. In recognition of her contributions, she has recently been awarded the Order of the British Empire for "Services to Mathematics Education".

Celia Hoyles belongs to that special breed of mathematics educators who, even while engaging with theoretical questions, do not lose sight of practice and, reciprocally, while engaged in advancing practice, do not forget the lessons they have learned from theory and from empirical research.

—from an ICMI Announcement

Sloan Fellows Announced

The Alfred P. Sloan Foundation has announced the names of 116 outstanding young scientists and economists who have been selected to receive Sloan Research Fellowships. Grants of $40,000 for a two-year period are administered by each fellow's institution. Once chosen, fellows are free to pursue whatever lines of inquiry most interest them, and they are permitted to employ fellowship funds in a wide variety of ways to further their research aims. More than 500 nominations for the 2004 awards were reviewed by a committee of distinguished scientists. The mathematicians on the committee were Benedict Gross, Harvard University; George Papanicolaou, Stanford University; and Ronald Stern, University of California, Irvine.

Following are the names of the 2004 Sloan Fellows who work in the mathematical sciences: MEREDITH D. BETTERTON, University of Colorado; ROMAN BEZRUKAVNIKOV, Northwestern University; KENNETH BROMBERG, University of Utah; LI-TIEN CHENG, University of California, San Diego; NATHAN M. DUNFIELD, California Institute of Technology; THOMAS J. HAINES, University of Maryland, College Park; VADIM KALOSHIN, California Institute of Technology; ROWAN KILLIP, University of California, Los Angeles; MARK KISIN, University of Chicago; IOANNIS KONTOYIANNIS, Brown University; LEI NI, University of California, San Diego; ROBERT SEIRINGER, Princeton University; KNUT SOLNA, University of California, Irvine; BENNY SUDAKOV, Princeton University; JEFF VIACLOVSKY, Massachusetts Institute of Technology; BALINT VIRAG, University of Toronto; DIVAKAR VISWANATH, University of Michigan; KEVIN WHYTE, University of Illinois, Chicago; AE JA YEE, Pennsylvania State University; CHONGCHUN ZENG, University of Virginia.

—From a Sloan Foundation announcement

NSF Graduate Research Fellowships Announced

The National Science Foundation (NSF) has awarded its Graduate Research Fellowships for fiscal year 2004. This program supports students pursuing doctoral study in all areas of science and engineering and provides a stipend of $18,000 per year for three years of full-time graduate study. Following are the names of the awardees in the mathematical sciences for 2004, followed by their undergraduate institutions (in parentheses) and the institutions at which they plan to pursue graduate work.

BENJAMIN ARMBRUSTER (University of Arizona), Massachusetts Institute of Technology; MARGARET S. BRISCOE (Tulane University-Newcomb College), University of California, Berkeley; JONATHAN H. BROWN (Vanderbilt University), Vanderbilt University; EVAN M. BULLOCK (Rice University), Harvard University; ERIK L. CARLSSON (Stanford University), Princeton University; DAVID A. CONSTANTINE (Eastern Nazarene College), Cornell University; DAVID J. GAEBLER (Harvey Mudd College), University of California, Berkeley; JANE GU (Seoul National University), Massachusetts Institute of Technology; MATTHEW T. HOLDEN (Pomona College), Massachusetts Institute of Technology; RYAN C. HYND (Georgia Institute of Technology), Stanford University; DIANA L. ISTOOK (Brigham Young University), University of Oklahoma; JESSE KASS (University of Michigan), Harvard University; MICHAEL J. KHOURY (Denison University), Princeton University; WAI KEI PETER LEE (Stanford University), Massachusetts Institute of Technology; BRIAN T. LEHMANN (Yale University), University of California, Berkeley; PO-SHEN LOH (California Institute of Technology), Massachusetts Institute of Technology; JOEL LOS (University of Paris VII), University of California, Berkeley; ANI W. MANICHAIKUL (Stanford University), Johns Hopkins University; BERNARD A. MARES (Brown University) Stanford University; PHILIP J. MATCHETT (Harvard University), University of California, Berkeley; MAKSIM I. MAYDANSKIY (University of California, Berkeley), Massachusetts Institute of Technology; RADU H. MIHAESCU (Princeton University), University of California, Berkeley; DAVID K. MILOVICH (Massachusetts Institute of Technology), University of Wisconsin, Madison; ANTHONY J. NARKAWICZ (Virginia Polytechnic Institute and State University), Duke University; ANDREW G. NIEDERMAIER (Harvey Mudd College),

University of California, Berkeley; JENNIFER S. NOVAK (Texas A&M University), University of Chicago; DIMITRI J. PAPAGEORGIOU (University of North Carolina, Chapel Hill), University of Texas, Austin; ANKIT B. PATEL (Harvard University), Massachusetts Institute of Technology; JONATHAN L. POTTHARST (Massachusetts Institute of Technology), Harvard University; ALEXANDER B. SCHWARTZ (Harvard University), Princeton University; JAMES G. SCOTT (University of Texas, Austin), Duke University; ALEKSANDR G. SKOROKHOD (Massachusetts Institute of Technology), University of California, Berkeley; DAVID I. SMYTH (University of Illinois, Urbana-Champaign), University of California, Berkeley; JOHN T. WORKMAN (University of Tennessee, Knoxville), Stanford University.

Editor's note: The institutions of graduate study listed here are from the students' original applications. In some cases students will have switched institutions by the time the fellowship tenure begins.

—From an NSF announcement

Fulbright Awards Announced

The J. William Fulbright Foundation and the United States Information Agency have announced the names of the recipients of the Fulbright Foreign Scholarships for 2003–2004. Following are the U.S. scholars in the mathematical sciences who have been awarded Fulbright scholarships to lecture or conduct research, together with their home institutions and the countries in which they plan to use the awards.

SUBHA CHAKRABORTI (University of Alabama, Tuscaloosa), South Africa; ABDERRAHMN ELKHADER (Northern State University, South Dakota), Jordan; JOHN B. FINK (Kalamazoo College), Ecuador; DENNIS J. GARITY (Oregon State University), Slovenia; JASON C.-H. HSU (Ohio State University), Iceland; ANATOLI F. IVANOV (Pennsylvania State University), Chile; NAIHUAN N. JING (North Carolina State University), Germany; JOSEPH B. KADANE (Carnegie-Mellon University), Chile; CHRISTOPHER M. KRIBS ZALETA (University of Texas, Arlington), Mexico; VICTOR V. PAMBUCCIAN (Arizona State University), Poland; RAHUL A. PARSA (Drake University), South Africa; CHRISTOPHER P. THRON (Motorola), Chad; FREDERI G. VIENS (Purdue University), France.

—From a Fulbright Foundation announcement

Guggenheim Fellowships Awarded

The John Simon Guggenheim Memorial Foundation has announced the names of 185 United States and Canadian artists, scholars, and scientists who were selected as Guggenheim Fellows from more than 3,200 applicants in the 2004 competition. The awards totaled $6,912,000. Guggenheim Fellows are appointed on the basis of distinguished achievement in the past and exceptional promise for future accomplishment.

Following are the names of the awardees in the mathematical sciences, together with their affiliations and areas of research interest: AMIR D. ACZEL, Brookline, Massachusetts: Descartes's missing notebook and the beginnings of modern mathematics; MICHAEL P. BRENNER, Harvard University: Mathematical models in developmental biology; HUAI-DONG CAO, Lehigh University: The Ricci flow on Kähler manifolds; PANAGIOTA DASKALOPOULOS, Columbia University: Studies in nonlinear diffusion equations; RUSSELL IMPAGLIAZZO, University of California, San Diego: Heuristics, proof complexity, and algorithmic techniques; MICHAEL T. LACEY, Georgia Institute of Technology: Singular integrals on smoothly varying lines; WILLIAM R. ZAME, University of California, Los Angeles: Theoretical and experimental studies of financial markets; DAVID ZUCKERMAN, University of Texas, Austin: Randomness and computation. In addition, mathematician MANIL SURI of the University of Maryland, Baltimore County, received a fellowship for the writing of fiction.

—From a Guggenheim Foundation news release

Intel Science Talent Search Winners Announced

Two high school students working in mathematics and one in physics have been awarded Intel Science Talent Search Scholarships for 2004. BORIS ALEXEEV, a seventeen-year-old student at Cedar Shoals High School in Athens, Georgia, won the second prize, a $75,000 scholarship. The title of Alexeev's project is "Minimal Deterministic Finite Automata (DFSAs) for Testing Divisibility". He has submitted his work for publication. LINDA B. WESTRICK, an eighteen-year-old student at Maggie L. Walker Governor's School in Richmond, Virginia, won fourth place and a $25,000 scholarship for her mathematics project "Investigations of the Number Derivative". EDUARD REZNIK, a seventeen-year-old student at Ward Melville High School in East Setauket, New York, won a $25,000 fifth-place scholarship for his physics project "New Exact Solutions to Einstein's Equations".

—From an Intel Corporation announcement

National Academy of Sciences Elections

The National Academy of Sciences has announced the election of 72 new members and 18 foreign associates in recognition of their distinguished and continuing achievements in original research.

Among the new members are several who work in the mathematical sciences: JOSEPH BERNSTEIN, professor, School of Mathematical Sciences, Tel Aviv University; PHILLIP COLELLA, senior staff mathematician and group leader, Applied Numerical Algorithms Group, Lawrence Berkeley National Laboratory; STEPHEN H. DAVIS, McCormick School Professor

and Walter P. Murphy Professor of Applied Mathematics, Northwestern University; SHAFRIRA GOLDWASSER, professor, Department of Electrical Engineering and Computer Science, Massachusetts Institute of Technology; BENEDICT H. GROSS, George Vasmer Leverett Professor of Mathematics, Department of Mathematics, and Dean, Harvard College, Harvard University; NICHOLAS M. KATZ, professor and chair, Department of Mathematics, Princeton University; CHARLES M. NEWMAN, professor of mathematics and director, Courant Institute of Mathematical Sciences, New York University; GEORGE F. OSTER, professor of cell and developmental biology and of environmental science, policy, and management, University of California, Berkeley; and RONALD L. RIVEST, professor of computer science, Massachusetts Institute of Technology.

—From an NAS news release

National Academy of Engineering Elections

The National Academy of Engineering has announced the election of 76 new members and 11 foreign associates, including four whose work involves the mathematical sciences. FRANK T. LEIGHTON of the Massachusetts Institute of Technology was elected for contributions to the design of networks and circuits and for technology for Web content delivery. LINDA R. PETZOLD of the University of California, Santa Barbara, was elected for advances in the numerical solution of differential/algebraic equations and their incorporation into widely distributed software. G. W. STEWART of the University of Maryland, College Park, was elected for the development of numerical algorithms and software widely used in engineering computation. Elected as a foreign associate was JOHN R. WILLIS of the University of Cambridge, United Kingdom, for contributions to the micromechanics of engineering materials and the establishment of rigorous bounds on the properties of nonlinear composites.

—From a National Academy of Engineering announcement