Mathematics People

Lieb Awarded Schock Prize

The Royal Swedish Academy of Sciences has announced the names of recipients of the Rolf Schock Prizes. These international prizes honor contributions to mathematics, logic and philosophy, visual arts, and music. The prizes, awarded every two years, amount to 400,000 Swedish crowns (approximately US$40,000).

ELLIOTT H. LIEB of Princeton University has been awarded the 2001 Schock Prize in mathematics "for his outstanding work in mathematical physics, particularly for his contribution to the mathematical understanding of the quantum-mechanical many-body theory and for his work on exact solutions of models in statistical mechanics and quantum mechanics."

Lieb has made pioneering contributions in many areas of mathematics, particularly mathematical analysis and mathematical physics. He has contributed to the understanding of many of the fundamental theories of quantum mechanics, statistical mechanics, and thermodynamics. Of particular importance is his work on exactly solvable models in statistical mechanics and quantum mechanics, as well as his contribution to understanding of the quantum-mechanical many-body problem. By studying the distribution of energy within quantum-mechanical systems, Lieb and his coworkers have achieved very precise results regarding fundamental questions of the stability of matter.

Elliott H. Lieb was born in Boston in 1932. He studied at the Massachusetts Institute of Technology and at the University of Birmingham, England, from which he received his Ph.D. in mathematical physics in 1956. He was professor of applied mathematics between 1968 and 1973 and of mathematics and mathematical physics between 1973 and 1975, both at MIT. Since 1975 he has been professor of mathematics and physics at Princeton University.

About Rolf Schock

Rolf Schock was born in France on April 5, 1933. His family had emigrated from Germany in 1931; they later settled in the United States. He studied geology, psychology, and mathematics at the University of New Mexico and then pursued postdoctoral studies in philosophy, first at the University of California, Berkeley, and then at UCLA. After moving to Sweden he received the Fil.Lic. degree in philosophy from Stockholm University in 1964 and a Ph.D. from Uppsala University in 1968. His dissertation, "Logics without existence assumptions", was an early work in what is now known as free logic and has often been cited by scholars in the field. Schock wrote many other works in logic and the philosophy of science. He never held a permanent appointment, although he was a lecturer in Sweden for brief periods, and for many years the Royal Institute of Technology provided him with a base. He was also a painter, photographer, and traveler. After his death in an accident on December 5, 1986, it came to light that he had left a considerable fortune, which he had inherited from his father. Schock bequeathed half of the funds for prizes in the arts and sciences.

—From a Royal Swedish Academy of Sciences announcement

Grabovsky and McCann Receive Monroe Martin Prize

The sixth Monroe Martin Prize of the University of Maryland, College Park, was presented on March 2, 2001. Two $2,000 awards were made.

The first recipient was YURY GRABOVSKY for his paper "Exact relations for effective tensors of polycrystals. I. Necessary conditions", which appeared in *Archive for Rational Mechanics and Analysis* **143** (1998), 309–329. This paper describes a general method for finding all exact relations for effective moduli of polycrystals by reducing the question to an algebraic problem of characterizing the rotationally invariant families of Jordan algebras. The method is applicable to a variety of physical settings, including elasticity, thermoelasticity, and piezoelasticity. Grabovsky was an undergraduate and graduate student at New York University and received his Ph.D. in 1994. He is currently on the faculty of Temple University.

The second recipient was ROBERT MCCANN for his paper "Exact solutions to the transportation problem on the line", which appeared in *Proceedings of the Royal Society of London* **A455** (1999), 1341–1380. This paper analyzes the solution of a classical optimization problem formulated by Monge in 1781. Couched in an economic setting, the problem is as follows: Given a distribution of iron mines and a distribution of factories that require iron ore, decide how the mines should supply the ore to the factories so as to minimize the total transportation costs. When the cost is a strictly concave increasing function of the distance traveled, this problem has a unique, geometrically characterized solution that exhibits a hierarchical structure. The paper elegantly exploits this structure in the one-dimensional setting to derive an algorithm that obtains the solution by a combinatorial sequence of finite-dimensional optimizations involving convex, separable network flows. After obtaining his B.S. from Queen's University at Kingston, McCann received his Ph.D. from Princeton University in 1994. He is currently on the faculty of the University of Toronto.

The Monroe Martin Prize was established to honor the outstanding contributions of Monroe H. Martin, professor emeritus at the University of Maryland, College Park. He was chair of the Department of Mathematics from 1942 until 1954 and was the founding director of the Institute for Fluid Dynamics and Applied Mathematics (a forerunner of the Institute for Physical Sciences and Technology) from 1952 until 1968. The prize is awarded every five years by the Institute for Physical Sciences and Technology to honor outstanding sole-authored papers by junior mathematicians. As on all previous occasions, the presentation of the awards was made by Martin, now in his ninety-fifth year. Previous prize winners are Neil Berger (1975), Marshall Slemrod (1980), Jonathan Goodman (1985), Marek Rychlik (1990), A. M. Stuart (1995), and Z. Xia (1995).

—From a University of Maryland announcement

Hitchin Receives Sylvester Medal

The 2000 Sylvester Medal of the Royal Society of London was awarded to NIGEL HITCHIN. He was recognized for his important contributions to many parts of differential geometry, in combination with complex geometry, integrable systems, and mathematical physics. His work interweaves the most modern ideas with the classical literature. This bronze medal is awarded triennially for the encouragement of mathematical research. A gift of £1,000 (about US$1,500) is also awarded.

—From a Royal Society announcement

National Academy of Sciences Elections

The National Academy of Sciences has announced the election of seventy-two new members and fifteen foreign associates. Following are the names and affiliations of those among the newly elected members who work in the mathematical sciences: ROBION C. KIRBY, University of California, Berkeley; GREGORY A. MARGULIS, Yale University; DONALD G. SAARI, University of California, Irvine; LESLIE G. VALIANT, Harvard University; MICHAEL S. WATERMAN, University of Southern California; and EFIM I. ZELMANOV, Yale University. Among the newly elected foreign associates are JACOB PALIS, Instituto de Mátematica Pura e Aplicada, Brazil; and MICHAEL POWELL, University of Cambridge.

—From an NAS announcement

Putnam Prizes Awarded

The winners of the 61st William Lowell Putnam Competition have been announced. The Putnam Competition is administered by the Mathematical Association of America and consists of an examination containing mathematical problems that are designed to test both originality and technical competence. Prizes are awarded to both individuals and teams.

The five highest ranking individuals, listed in alphabetical order, were GABRIEL D. CARROLL, University of California, Berkeley; ABHINAV KUMAR, Massachusetts Institute of Technology; CIPRIAN MANOLESCU, Harvard University; PAVLO PYLYAVSKYY, Massachusetts Institute of Technology; and ALEXANDER B. SCHWARTZ, Harvard University.

Institutions with at least three registered participants obtain a team ranking in the competition based on the rankings of three designated individual participants. The five top-ranked teams (with team members listed in alphabetical order) were: Duke University (John J. Clyde, Jonathan G. Curtis, Kevin D. Lacker); Massachusetts Institute of Technology (Aram W. Harrow, Abhinav Kumar, Ivan Petrakiev); Harvard University (Lukasz Fidkowski, Davesh Maulik,

Christopher C. Mihelich); California Institute of Technology (Kevin P. Costello, Christopher M. Hirata, Michael Shulman), and University of Toronto (Jimmy Chui, Pavel T. Gyrya, Pompiliu Manuel Zamfir).

Carroll, Schwartz, and Lacker are all former competitors and winners in the U.S. and International Mathematical Olympiads.

The top five individuals in the competition received cash awards of $2,500; the next ten received $1,000. The first-place team was awarded $25,000, with each team member receiving $1,000. The team awards for second place were $20,000 and $800; for third place, $15,000 and $600; for fourth place, $10,000 and $400; and for fifth place, $5,000 and $200.

—Elaine Kehoe

Tarokh Receives Waterman Award

VAHID TAROKH of the Massachusetts Institute of Technology is the recipient of the Alan T. Waterman Award of the National Science Foundation.

Tarokh is a recognized leader in the research field of wireless communications and the primary inventor of "space-time coding", a technique that significantly improves the speed and reliability of wireless data transmission. He built on highly complex mathematical models to develop protocols that can be transmitted via multiple antennas and received by sites that may or may not use multiple antennas.

The annual Waterman Award honors an outstanding young U.S. scientist or engineer who is at the forefront of his or her research field. The honoree receives a medal and a $500,000 grant over three years for scientific research or advanced study in any field of science or engineering.

—From an NSF announcement

Deaths

GARY L. AMENDE, of Sheridan, WY, died on September 18, 2000. Born on April 22, 1969, he was a member of the Society for 4 years.

NORMAN V. FELLERS, Keane Inc., Rockville, MD, died on April 9, 2001. Born in 1932, he was a member of the Society for 42 years.

GERALD B. HUFF, of Falls Church, VA, died on April 17, 2001. Born on May 23, 1909, he was a member of the Society for 58 years.

GUENTER M. SCHINDLER, retired, Rockwell International, Seal Beach, CA, died on December 19, 2000. Born on September 15, 1928, he was a member of the Society for 42 years.

About the Cover

The cover this month was suggested by the review of *Number* by Midhat Gazalé elsewhere in this issue.

The image is from the treatise *Algorismus* by Johannes Sacrobosco (called in his native language John of Holywood), one of several contained in MS 184 in the Rare Book and Manuscript Library at Columbia University. It shows a personification of Arithmetic, a not uncommon figure of the Middle Ages, lecturing on the "Arabic" numerals to a student who seems to be working at a sand table. Sacrobosco's treatise was the most popular university text on arithmetic of the period, based ultimately on a text by the Arabian mathematician al-Khwârizmî, introduced to Europe sometime early in the thirteenth century. Consuelo Dutschke, curator at the Library, says, "I think that an individual, likely German, copied this book out for himself, sometime around 1450. He wanted a copy of these texts, and it was cheaper to do the labor himself than to have a professional scribe do it for him. The copyist bought his own paper, bought or made his own ink, borrowed an exemplar of the text, and sat down and did it. The fifteenth century has far more books that look like this one than of the sort that get reproduced in art history books."

For modern mathematicians, decimal notation is a nearly trivial business, and few of us are familiar with the rather complicated story of how Western civilization acquired its present familiarity with numbers. After all, however, it is arguable that what most distinguishes modern mathematics from that of classical Greece is the way in which numbers are dealt with in everyday life. This came about at both universities and in commercial practice during the Middle Ages through a process that we can only dimly perceive.

The image is one of several charming and unusual ones illustrating mathematics in popular culture that can be found in the book *Numbers—The Universal Language* by Denis Guedj.

—Bill Casselman (covers@ams.org)