Mathematics People

Hintikka and Caffarelli Receive Rolf Schock Prizes

Two mathematicians are among the winners of the Rolf Schock Prizes for 2005. The Schock Prize in Logic and Philosophy was awarded to JAAKKO HINTIKKA of Boston University "for his pioneering contributions to the logical analysis of modal concepts, in particular the concepts of knowledge and belief." The Schock Prize in Mathematics was given to LUIS A. CAFFARELLI of the University of Texas at Austin "for his important contributions to the theory of nonlinear partial differential equations."

The versatile philosopher and artist Rolf Schock (1933–86) described in his will a prize to be awarded in such widely differing subjects as logic and philosophy, mathematics, the visual arts, and music. The Royal Swedish Academy of Sciences, the Royal Swedish Academy of Fine Arts, and the Royal Swedish Academy of Music have awarded these prizes every other year since 1993. Each prize carries a monetary award of SEK 400,000 (about US$56,400).

Jaakko Hintikka

Jaakko Hintikka is known as the main architect of game-theoretical semantics and of the interrogative approach to inquiry and also as one of the architects of distributive normal forms, possible-world semantics, tree methods, infinitely deep logics, and the present-day theory of inductive generalization. He was one of the philosophers who established "possible-world" semantics for modal logic, a form of semantics that attempts to improve our understanding of modal concepts, not only such concepts as "necessary" and "possible" but also concepts such as "knowledge", "belief", "ought", "right", and "wrong". Hintikka's system is based on the concept of a "model set", that is, a set of sentences that may be understood as a partial description of a possible world. In his semantics, systems of such model sets are investigated. Hintikka has applied his semantics to many different fields. His semantic analysis of the concepts of "knowledge" and "belief" has led to what was later called epistemic logic, which has been highly influential both within and outside of philosophy. For example, it is of fundamental importance for pioneering work in datalogy and game theory. His mathematical interests are in logic and foundations of mathematics, including distributive normal forms, independence-friendly logic, definability, infinitely deep languages, and extremality assumptions in mathematical theories.

Jaakko Hintikka was born in Vantaa, Finland, in 1929. He received his Ph.D. from the University of Helsinki in 1956. He has taught at Helsinki, at the Academy of Finland, Florida State University, and Stanford University and has been at Boston University since 1990. He has authored or coauthored more than thirty books and monographs, including *The Principles of Mathematics Revisited*, and his works have been published in nine languages. Five volumes of his selected papers have been published, and a comprehensive examination of his thought, *The Philosophy of Jaakko Hintikka*, appeared in 2004 as part of the Library of Living Philosophers. He has held the John Locke Lectureship at Oxford University, the Hägerström Lectureship at Uppsala University, and the Immanuel Kant Lectureship at Stanford University. He has been the recipient of the Wihuri International Prize (1976), a Guggenheim Fellowship (1979–80), and honorary doctorates from the University of Liège, the Jagiellonian University of Cracow, and the Universities of Uppsala (2000), Oulu (2002), and Turku (2003).

Luis A. Caffarelli

Luis A. Caffarelli is the world's leading specialist in free boundary problems for nonlinear differential equations. Differential equations are the mathematician's foremost aid for describing change. In the simplest case, a process that depends on one variable alone—for example, time—may be described by an ordinary differential equation. But more complex phenomena are dependent on many more variables: perhaps time plus one, two, or three spatial variables. These processes require the use of partial differential equations and are very common in mathematical descriptions of natural phenomena. Usually, important data are locked at a boundary—the earth's surface, for example, when studying weather. But mathematical solutions become much more complicated if the boundary is free—that is, if it can vary, such as, for example, the boundary between frozen and unfrozen soil. Caffarelli's work has provided pioneering solutions to many such problems that have long defied mathematicians.

Luis A. Caffarelli was born in Argentina in 1948. He received his Ph.D. in mathematics from the University of

Buenos Aires in 1972. He has taught at the University of Minnesota, the Courant Institute of Mathematical Sciences, the University of Chicago, and the Institute for Advanced Study. He holds honorary doctorates from the École Normal Supérieure, Paris; the Universidad Autónoma de Madrid; and the Universidad de la Plata.

Mathematicians who have previously received the Schock Prize are: Solomon Feferman (2003), Richard P. Stanley (2003), Elliott H. Lieb (2001), Yuri Manin (1999), Dana S. Scott (1997), Mikio Sato (1997), Andrew Wiles (1995), and Elias M. Stein (1993).

—From a Royal Swedish Academy news release

Presidential Mentoring Awards Announced

On May 16, 2005, President Bush announced the recipients of the 2004 Presidential Award for Excellence in Science, Mathematics, and Engineering Mentoring, a program supported and administered by the National Science Foundation (NSF). Each award includes a US$10,000 grant for continued mentoring work.

The awards honor individuals and institutions that have enhanced the participation of underrepresented groups—such as women, minorities, and people with disabilities—in science, mathematics, and engineering education at all levels. Since its inception in 1996, the PAESMEM program has recognized eighty-seven individuals and sixty-seven institutions. Each year's awardees add to a widening network of outstanding mentors in the United States, assuring that tomorrow's scientists and engineers will better represent the nation's diverse population. This year, nine individuals and five institutions received the award.

Among the individual awardees are the following:

LENORE BLUM of Carnegie Mellon University helped pioneer the Expanding Your Horizons program at Mills College in 1973. The program—designed to introduce young female students to women in science and related careers—has since gone national through the Math/Science Network. Blum's leadership has also been instrumental in transforming the culture of computing at Carnegie Mellon to embrace diversity as critical for the field and future of our nation and by creating a model mentorship organization, Women@SCS, for women students in computer science.

RICHARD LADNER of the University of Washington pioneered computer networking for the deaf-blind using large print and paperless Braille displays. He is dedicated to increasing the number of students with disabilities who will pursue graduate degrees. Ladner's mentoring efforts extend beyond the university, reaching students at the high-school level. He is also a strong advocate for women in science and engineering and a supporter of NSF's ADVANCE program.

ELIZABETH YANIK of Emporia State University (Kansas) is considered a passionate teacher who directs and sustains a half dozen mentoring programs at the school. Her MASTER IT program is a weeklong residential summer program engaging girls (grades 8 and 9) in mathematics and science activities on the ESU campus. Her Interdisciplinary Science and Mathematics provides ESU students with opportunities for early research experiences. Participants include students majoring in biological sciences, physical sciences, mathematics, and computer science.

Among the institutional awards are the following:

The Department of Mathematics at the University of Iowa is the largest single awarder of mathematics doctorates to minorities in the nation. Articulated less than ten years ago, Iowa's commitment to increasing the numbers of minority graduate students has resulted in a well-crafted recruiting campaign to convince students that the environment is a supportive one. A standing committee has responsibilities from student admissions to monitoring their progress. Alliances with other institutions including, but not restricted to, those serving minority students has resulted in substantial support from external grants and new and continuing collaborations with minority faculty elsewhere. Currently, the department has 21% underrepresented minority graduate students. It is ensuring continuity by institutionalizing structures, thereby permitting the growth of a community where organizations work together.

The Society for the Advancement of Chicanos and Native Americans in Science (SACNAS) has established an array of mentoring activities at scientific meetings, teacher workshops, and through its own annual conference. It engages in broad partnerships with other professional organizations. The society provides and supports opportunities for students to strengthen their presentation skills and self-confidence and to make connections with scientists. Recently established and expanded student chapters have brought to 2,862 the number of student members, which should broaden the organization's reach. An ongoing project to develop biographies of Hispanic/Latino and Native American scientists serves as an inspiration to students from these populations.

—From an NSF announcement

Sloan Receives 2005 Information-Based Complexity Prize

The recipient of the 2005 Information-Based Complexity Prize is IAN SLOAN, Scientia Professor at the University of New South Wales, Sydney, Australia. The prize consists of US$3,000 and a plaque. The award was presented at the Foundations of Computational Mathematics (FoCM) Conference in Santander, Spain, in June 2005.

This annual prize is given for outstanding contributions to information-based complexity.

—Joseph Traub, Columbia University

Haggstrom and O'Connell Awarded Rollo Davidson Prizes

The Trustees of the Rollo Davidson Trust give notice that they have awarded the Rollo Davidson Prize for 2005 to OLLE HAGGSTROM, Chalmers University of Technology, for his work across discrete probability and interacting systems; and to NEIL O'CONNELL, University College, Cork, for his work in networks, large deviations, and random matrices.

Further details of the Rollo Davidson Trust may be found at http://www.statslab.cam.ac.uk/Rollo/index.html.

—From a Rollo Davidson Trust announcement

National Academy of Sciences Elections

The National Academy of Sciences (NAS) has announced the election of seventy-two new members and eighteen foreign associates. The following mathematical scientists are among the newly elected members: MALCOLM H. CHISHOLM, Ohio State University; IAIN M. JOHNSTONE, Stanford University; SERGIU KLAINERMAN, Princeton University; JÁNOS KOLLÁR, Princeton University; STANLEY OSHER, University of California, Los Angeles; and MARGARET H. WRIGHT, Courant Institute of the Mathematical Sciences. ADI SHAMIR of the Weizmann Institute of Science, Rehovot, Israel, was elected a foreign member.

—From an NAS announcement

American Academy Elections

Nine mathematical scientists have been elected to membership in the American Academy of Arts and Sciences for 2005. They are M. SALAH BAOUENDI, University of California, San Diego; HERBERT EDELSBRUNNER, Duke University; ERIC M. FRIEDLANDER, Northwestern University; JEROME H. FRIEDMAN, Stanford University; THOMAS G. KURTZ, University of Wisconsin, Madison; GREGORY LAWLER, Cornell University; LINDA PREISS ROTHSCHILD, University of California, San Diego; and BARRY SIMON, California Institute of Technology. ALEXANDER LUBOTZKY, Hebrew University of Jerusalem, Israel, was elected a foreign member.

The American Academy of Arts and Sciences was founded in 1780 to foster the development of knowledge as a means of promoting the public interest and social progress. The membership of the academy is elected and represents distinction and achievement in a range of intellectual disciplines—mathematical and physical sciences, biological sciences, social arts and sciences, and humanities and fine arts.

—From an AAAS announcement

Ferran Sunyer i Balaguer Prizes Awarded

The Ferran Sunyer i Balaguer Foundation has awarded the Ferran Sunyer i Balaguer Prizes for 2005 to ANTONIO AMBROSETTI and ANDREA MALCHIODI, both of the International School for Advanced Studies of Trieste (SISSA/ISAS), for their monograph *Perturbation Methods and Semilinear Elliptic Problems on R^n* and to JOSÉ SEADE of Universidad Nacional Autónoma de Mexico for his monograph *On the Topology of Isolated Singularities in Analytic Spaces*.

The Ferran Sunyer i Balaguer Foundation (http://www.crm.es/FerranSunyerBalaguer/ffsb.htm) of the Institut d'Estudis Catalans (IEC) awards this international prize every year to honor the memory of Ferran Sunyer i Balaguer (1912–67), a self-taught Catalan mathematician who gained international recognition for his research in mathematical analysis despite the serious physical disabilities with which he was born.

—From a Ferran Sunyer i Balaguer Foundation announcement

Putnam Prizes Awarded

The winners of the sixty-fifth William Lowell Putnam Mathematical 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 REID W. BARTON, Massachusetts Institute of Technology; VLADIMIR V. BARZOV, Massachusetts Institute of Technology; ANA CARAIANI, Princeton University; DANIEL M. KANE, Massachusetts Institute of Technology; and AARON C. PIXTON, Princeton 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 Massachusetts Institute of Technology (Reid W. Barton, Daniel M. Kane, Emanuel I. Stoica), Princeton University (Ana Caraiani, Suehyun Kwon, Mihai Manea), Duke University (Nikifor C. Bliznashki, Oaz Nir, Lingren Zhang), University of Waterloo (Olena Bormashenko, Ralph Furmaniak, Michael A. Lipnowski), and California Institute of Technology (Po-Ru Loh, Mehmet B. Yenmez, Rumen I. Zarev).

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

The Elizabeth Lowell Putnam Prize is awarded periodically to a woman whose participation in the Putnam Competition is deemed particularly meritorious. In the recent competition, this prize went to ANA CARAIANI of Princeton University. The prize carries a cash award of US$1,000.

—Elaine Kehoe

USA Mathematical Olympiad

The thirty-fourth annual USA Mathematical Olympiad was held April 19 and 20, 2005. The students participating in the Olympiad were selected on the basis of their performances on the American High School and American Invitational Mathematics Examinations, which involved hundreds of students.

The twelve highest scorers in the USAMO, listed in alphabetical order, were ROBERT CORDWELL, Albuquerque, New Mexico; ZHOU FAN, Parsippany, New Jersey; SHERRY GONG, Exeter, New Hampshire; RISHI GUPTA, Palo Alto, California; HYUN SOO KIM, Hackensack, New Jersey; BRIAN LAWRENCE, Silver Spring, Maryland; ALBERT NI, Aurora, Illinois; NATEE PITIWAN, North Andover, Massachusetts; ERIC PRICE, Alexandria, Virginia; PENG SHI, Toronto, Ontario, Canada; YI SUN, San Jose, California; and YUFEI ZHAO, North York, Ontario, Canada.

The twelve USAMO winners will attend the Mathematical Olympiad Summer Program (MOSP) from June 12 through July 2. Then six of the twelve students will be selected as the United States team to compete in the International Mathematical Olympiad (IMO) to be held in Merida, Mexico, July 8–19, 2005.

—From an American Mathematics Competitions announcement