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# Mathematics People

## Hejhal Receives Gustafsson Prize

DENNIS HEJHAL of Uppsala University has received the 1997 Göran Gustafsson Prize in Mathematics. These prizes, presented by the Göran Gustafsson Foundation for Scientific and Medical Research to researchers in Sweden, are given in the areas of molecular biology, physics, chemistry, and medicine, in addition to mathematics.

Hejhal was cited “for his research in analytic number theory and quantum chaos.” The prize consists of 100,000 Swedish crowns (approximately \$13,000) plus annual research support of 850,000 Swedish crowns (approximately \$110,000) for three years.

Hejhal currently holds a joint appointment at Uppsala and the University of Minnesota.

—*from Royal Swedish Academy of Sciences news release*

## Menger Prize Committee

The three-person Menger Prize Committee was formed by the American Mathematical Society in 1995 to select the chair of the AMS Judges Panel for the Special Award in Mathematics at the International Science and Engineering Fair (ISEF) and to oversee and participate in the awarding of prizes. The Committee supports the selection process of judges during the year and is an AMS point of contact. Each member of the Committee serves for three years. As a member’s term expires, a new member, who has served as chair of the Judges Panel, comes aboard. The members of the Menger Prize Committee are Julian Palmore (chair) and Jerry and Gisele Goldstein of Memphis State University.

The AMS has participated in ISEF for the past ten years. For the past five years—first, in 1993, as a member of the AMS Panel of Judges (in Biloxi, MS), then as chair of the Panel in 1994 (in Birmingham, AL), and finally as chair of the Menger Prize Committee since its inception in 1994—I have had the pleasure to view mathematics exhibits and

talk to participants in ISEF. The best work of these high school students, aged fourteen to eighteen, is at a level of graduate study and research in mathematics. To reach ISEF the students have participated in regional science fairs in the U.S. and foreign countries. The number of foreign participants is about 5 percent of approximately 1,000 total ISEF participants. The mathematics participants number about 50, of whom 9 this year were from other than the fifty states.

An interesting connection between the Westinghouse Science Talent Search and the International Science and Engineering Fair arose this year when the third- and fourth-place winners of the Science Talent Search were also the first- and second-place winners of the AMS Special Award in Mathematics at ISEF. Daves Maulik, the first-place winner this year (in Louisville, KY), was awarded first place from the AMS in 1994 (in Birmingham, AL), in 1995 (in Hamilton, ON), and in 1996 (in Tucson, AZ).

The accompanying article by Marius Nkashama lists all of the prizes awarded this year at ISEF.

—*Julian Palmore*

## AMS Menger Awards at the International Science and Engineering Fair

The 1997 International Science and Engineering Fair (ISEF) was held May 10–16, 1997, in the Commonwealth Convention Center in Louisville, Kentucky. Student winners were among 1,089 ninth- through twelfth-graders who earned the right to compete by winning top prizes at local, regional, state, or (in the case of some foreign students) national science fairs to reach the finals at ISEF. Prizes ranged over plaques, certificates, T-shirts, books, magazine/journal subscriptions, organization memberships, and cash awards. In addition to ISEF recognition, there were special awards made by other groups, including professional and educational organizations, industry, branches



**AMS Menger Award winners. Back row, left to right: D. Maulik, N. Eriksson, J. Rahe, J. Pelka, M. N. Nkashama (AMS panel) Y. Chen, S. Halle, M. Seligman, M. Schecter. Front row, left to right: C. Fu, S. Rutherford, J. Chen, T. Mack, D. Little.**

of the military, and colleges and universities. For the first time in its 48-year history, the ISEF offered more than \$1 million in tuition grants.

For the tenth time, the AMS has presented the Karl Menger Memorial Awards at ISEF. This year's AMS panel consisted of six mathematicians: Gisele Ruiz Goldstein and Jerome Goldstein, both of the University of Memphis; Lee Larson of the University of Louisville; Carl Lee of the University of Kentucky (Lexington); Marius Nkashama (chair) of the University of Alabama at Birmingham; and Julian Palmore of the University of Illinois at Urbana-Champaign. The panel considered 50 projects, including all 45 projects entered in mathematics. Each panel member inspected each project, and each student was interviewed by at least two members of the panel. Winners (one first place, two second place, four third place) were given cash prizes, and they and five honorable mention students were given copies of *What's Happening in the Mathematical Sciences* by Barry Cipra (published by the AMS) and a short intellectual biography of Karl Menger, for whom the awards are named. The Karl Menger Memorial prize winners were as follows.

First Place (\$1,000): DAVESH MAULIK, "Ordered Fields", Senior, Roslyn High School, Roslyn Heights, New York. This is the fourth year Maulik has won the first prize, a remarkable achievement.

Second Place (\$500 each): NICHOLAS ERIKSSON, " $q$ -Series, Elliptic Curves, and Odd Values of the Partition Function", Senior, Sentinel High School, Missoula, Montana; JEREMY RAHE, "Prime Factorials", Sophomore, Bellaire Senior High School, Bellaire, Texas.

Third Place (\$250 each project): JENNIFER PELKA, "Self-Complementary Degree Sequences", Freshman, Lake Highland Preparatory School, Orlando, Florida; YEN-JEN CHEN, "Banquet Problems", Junior, Taipei Municipal Chien-Kuo Senior High School, Taipei, Taiwan; SYLVAIN HALLE, "Unification of the Knowledge Base Creation Process", Junior, Collège de Levis, Levis, Quebec, Canada; MELANIE SCHECHTER and MATTHEW SELIGMAN, "Products, Sums and Duality", Ju-

niors, Roslyn High School, Roslyn Heights, New York.

Honorable Mention: THOMAS MACK, "Irrationality of  $Zeta(3)/\pi^3$ ", Senior, Menchville High School, Newport News, Virginia; SUSANNAH RUTHERGLEN, "Steiner 3-Point Problem", Sophomore, Charlottesville High School, Charlottesville, Virginia; JY-YING JANET CHEN, "Interesting Patterns of Inverse Pairs in Modular Arithmetic", Senior, A&M Consolidated High School, College Station, Texas; CHUN-HSIANG FU, "Bisecting Plane of a Tetrahedron", Junior, Taiwan Provincial Hsinchu Senior High School, Taiwan; DANIEL YING-JEH LITTLE, "Knots and Not Knots

Too: Phase II", Sophomore, Clear Lake High School, Houston, Texas.

As the titles indicate, the projects were remarkable and interesting for their breadth and for the quality of the work by the students. Note how many of the awards went to freshman, sophomores, and juniors!

—Marius N. Nkashama

## 1997 USA Mathematical Olympiad Winners

The 1997 edition of the USA Mathematical Olympiad (USAMO) exam consisted of six questions to be solved in six hours. The exam was given on May 1 to 182 students selected as a consequence of their performance on the 1997 American High School and American Invitational Mathematics Examinations.

JOSH P. NICHOLS-BARRER of Newton South High School, Newton Center, MA, is the first-place winner. The other winners are: CARL J. BOSLEY, Washburn Rural High School, Topeka, KS; LI-CHUNG CHEN, Monta Vista High School, Cupertino, CA; JOHN J. CLYDE, New Plymouth High School, New Plymouth, ID; NATHAN G. CURTIS, Thomas Jefferson High School of Science and Technology, Alexandria, VA; KEVIN D. LACKER, Sycamore High School, Cincinnati, OH; DAVESH MAULIK, Roslyn High School, Roslyn Heights, NY; and DANIEL A. STRONGER, Stuyvesant High School, New York, NY.

Four of this year's winners won last year: Bosley, Curtis, Stronger, and Nichols-Barrer. Nichols-Barrer also won in 1995. With the exception of Lacker and Maulik, the group of winners will represent the United States in the International Mathematical Olympiad, which is to be held in Mar del Plata, Argentina, on July 24 and 25. The leader of

the team will be Titu Andreescu from the Illinois Mathematics and Science Academy, the deputy will be Elgin Johnston from Iowa State University, and Walter Mientka will serve as the Official Leader Observer. Travel funds to the site of the IMO are provided by the Army Research Office.

The Mathematical Olympiad Summer Program, which prepares the team for the international competition, includes as participants the top 8 winners and 22 other high-ranking USAMO students. This program is sponsored by the Office of Naval Research and the Matilda Wilson Foundation, with support from the University of Nebraska-Lincoln, the site of the program.

The USAMO is run by American Mathematics Competitions.

—*Mathematical Association of America Announcement*

## Rolf Schock Prizes Awarded

The Royal Swedish Academy of Sciences has announced the names of recipients of the Rolf Schock Prizes. These international prizes honor contributions to logic and philosophy, mathematics, visual arts, and music. The prizes amount to 400,000 Swedish crowns (approximately US\$50,000).

### Schock Prize in Logic and Philosophy

DANA S. SCOTT received the prize in logic and philosophy “for his conceptually oriented logical works, especially the creation of domain theory, which has made it possible to extend Tarski’s semantical paradigm to programming languages as well as to construct models of Curry’s combinatory logic and Church’s calculus of lambda conversion.”

Contemporary logic has diversified into a number of branches. Scott has made fundamental contributions to several of these, notably automata theory, axiomatic set theory, model theory, and modal logic. An especially general interest, however, attaches to his creation of domain theory, which has made it possible to provide programming languages with a compositional semantics of the same kind as was given in the 1930s by the Polish logician Alfred Tarski for more traditional logical languages, like predicate logic and simple type theory. The introduction of the notion of domain also enabled Scott to construct models of Curry’s combinatory logic and Church’s calculus of lambda conversion, two closely related formal calculi which had previously resisted all attempts at semantic interpretation and which had therefore only been studied by purely syntactic means. The theory of Scott domains, as they are now called, constitutes the mathematical basis of the branch of computer science which is now generally referred to as “semantics of programming languages” and has been pivotal in establishing “logic and computer science” as a new branch of logic. Scott’s works are marked throughout by their conceptual clarity and formal elegance.

Scott was born on October 11, 1932, in Berkeley, California. He studied as a pupil of Alfred Tarski at the University of California, Berkeley, and obtained his bachelor’s degree there in 1954. He took his doctoral degree at Princeton University in 1958 with Alonzo Church as his thesis advisor. Scott has taught at many universities, among them UC Berkeley (1960–63) and Stanford University (1963–69). He was a professor of philosophy at Princeton University from 1969 until 1972, when he became a professor of mathematical logic at Oxford University. In 1981 he moved from Oxford to Carnegie Mellon University, where he is now professor of computer science, mathematical logic, and philosophy. He holds honorary doctorates from several European universities and is a member of several scientific academies, including the U.S. National Academy of Sciences.

### Schock Prize in Mathematics

MIKIO SATO received the prize in mathematics “for his creation of the theory of hyperfunctions. Professor Sato has been the driving force behind a world-leading group of researchers in algebraic analysis. His work in theoretical physics has increased our understanding of the divergences of quantum theory.”

Sato’s theory of hyperfunctions allows much freer calculations than does classical calculus. A function may not have a derivative which is a function, but it does have a derivative which is a hyperfunction. Every function is regarded as a sum of limit values of holomorphic functions, which means that one uses the fact that immediately outside the real numbers there are complex numbers—this is said to reflect the old idea that phenomena in the real world are limits of complex (imaginary, fictitious!) events that lie very close to but are still outside our reach. A rich theory for differential equations has been the result. The theory of hyperfunctions is competing with the so-called theory of distributions and often gives analogous results, but along a different path. In some sense the two theories are equivalent, but there are important differences in mode of attack. One theory is best known in Europe and the Americas, the other in Japan. Sato is deeply interested in and motivated by problems in theoretical physics. His important contributions concern Feynman integrals and integrable systems.

Mikio Sato was born in 1928. He graduated from Tokyo University in 1952. In 1970 he became a research professor at the Research Institute for Mathematical Sciences at Kyoto University. He is now an emeritus professor there.

### About Rolf Schock

Rolf Schock was born in France on April 5, 1933. His family emigrated in 1931 and settled in the U.S. 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 later a Ph.D. from Uppsala University. 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, though 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 keen painter, photographer, and traveler. After his death in an accident in December 1986 it came to light that he 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 Royal Swedish Academy of Sciences news release*

## Wiles Named MacArthur Fellow

ANDREW J. WILES of Princeton University has been selected to receive a fellowship from the John D. and Catherine T. MacArthur Foundation. He is one of 23 scholars, artists, and writers receiving the prestigious fellowships. Wiles will receive over five years a stipend totaling \$275,000.

Wiles's 1994 proof of the Shimura-Taniyama conjecture on elliptic curves included a proof of Fermat's Last Theorem, which had challenged number theorists for the past 350 years. The culmination of nearly a decade of work, the proof is part of a broad revolution in algebraic number theory, which arose as a field in its modern form from the numerous failures to prove the Fermat assertion.

Individuals cannot apply for MacArthur Fellowships. Instead, names are proposed to the Foundation by a group of 125 or more designated nominators in a variety of professions and areas of the country. Their nominations are reviewed by a 12-member selection committee, which meets eight times a year. Final approval for MacArthur Fellowships comes from the Foundation's Board of Directors. There is no annual quota of fellows and no predetermined time for naming them.

—*from MacArthur Foundation news release*

## Visiting Mathematicians

*(Supplementary List)*

Mathematicians visiting other institutions during the 1997-98 academic year were listed in the June/July 1997 issue of the *Notices*, pp. 715-717. The following is an update to that list (home countries are listed in parentheses).

ERNST GEKELER (Germany), Concordia University, Drinfeld Modules and Drinfeld Modular Curves, 3/98.

HEIDE GLUSING-LUERSSSEN (Germany), University of Notre Dame, Applied Mathematics, 8/97-5/98.

LASSE HOLMSTROM (Finland), George Mason University, Computational Statistics, Neural Nets, 8/97-7/98.

JAE KEOL PARK (South Korea), University of Southwestern Louisiana, Ring and Module Theory, 1/98-2/98.

JANA TRGALOVA (Slovak Republic), Concordia University, Mathematics Education, 5/97-4/98.

KONDRAGUNTA VENKATESWARLU (India), Concordia University, Statistics, 1/98-6/98.

## Deaths

B. J. BALL, of Austin, Texas, died on December 24, 1996. Born on November 29, 1925, he was a member of the Society for 47 years.

RENATE CARLSSON, of the University of Hamburg, died on April 5, 1997. Born May 1, 1941, she was a member of the Society for 23 years.

EUGENE B. FABES, of the University of Minnesota, died on May 17, 1997. Born on February 6, 1937, he was a member of the Society for 33 years.

ROBERT N. GOSS, of Claremont, CA, died on January 21, 1997. Born on January 7, 1921, he was a member of the Society for 48 years.

W. N. HUFF, of Norman, OK, died on August 11, 1996. Born on December 30, 1912, he was a member of the Society for 59 years.

ED W. HUFFMAN, professor at Southwest Missouri State University, died on November 3, 1996. Born on December 29, 1942, he was a member of the Society for 23 years.

DANIEL C. LEWIS, professor emeritus of Johns Hopkins University, died on June 19, 1997. Born on August 14, 1904, he was a member of the Society for 77 years.

RAYMOND A. LYTLE, professor emeritus of the University of South Carolina, died on April 2, 1997. Born in September 1919, he was a member of the Society for 53 years.

M. EVANS MUNROE, professor emeritus of the University of New Hampshire, died in April 1997. Born on October 8, 1918, he was a member of the Society for 55 years.

JOHN M. H. OLMSTED, professor emeritus of Southern Illinois University at Carbondale, died on March 31, 1997. Born on June 28, 1911, he was a member of the Society for 59 years.

D. G. VELESZ, professor emeritus of Quincy University, Quincy, Illinois, died in 1997. Born on April 26, 1909, he was a member of the Society for 51 years.

DANIEL H. WAGNER, of Malvern, Pennsylvania, died on March 12, 1997. Born on August 24, 1925, he was a member of the Society for 48 years.

DAVID ZEITLIN, of Minneapolis, Minnesota, died on November 5, 1996. Born on January 22, 1924, he was a member of the Society for 43 years.

## Erratum

One of the death notices in the June/July 1997 issue of the *Notices*, page 707, gave an incorrect middle initial for the deceased. The correct name is Donald H. Hyers.