Mathematics People

Tao Receives 2008 Waterman Award

TERENCE TAO of the University of California, Los Angeles, has received the Alan T. Waterman Award from the National Science Foundation. Called a "supreme problem-solver" and named one of "the Brilliant 10" scientists by *Popular Science* (October 2006), Tao's extraordinary work, much of which has been funded by NSF through the years, has had a tremendous impact across several mathematical areas.

The annual Waterman Award recognizes an outstanding young researcher in any field of science or engineering supported by NSF. Candidates may not be more than thirty-five years old, or seven years beyond receiving a doctorate, and must stand out for their individual achievements. In addition to a medal, the awardee receives a grant of US$500,000 over a three-year period for scientific research or advanced study in their field.

Terence Tao was born in Adelaide, Australia, in 1975. His genius in mathematics began early in life. He started to learn calculus when he was seven years old, at which age he began high school; by the age of nine he was already very good at university-level calculus. By the age of eleven, he was thriving in international mathematics competitions. Tao was twenty when he earned his doctorate from Princeton University, and he joined UCLA's faculty that year. UCLA promoted him to full professor at age twenty-four. Tao now holds UCLA's James and Carol Collins Chair in the College of Letters and Science. He is also a fellow of the Royal Society, London; the Australian Academy of Sciences (corresponding member); and the National Academy of Sciences (foreign associate). Tao's areas of research include partial differential equations, combinatorics, number theory, harmonic analysis, and algebraic geometry.

In addition to the prestigious Waterman Award, Tao has received a number of other awards, including the Salem Prize (2000), the AMS Bôcher Prize (2002), the Fields Medal (2006), the SASTRA Ramanujan Prize (2006), a MacArthur Fellowship (2006), and the Ostrowski Prize (2007).

Previous recipients of the Waterman Award in the mathematical sciences are: Emmanuel Candès (2006), Gang Tian (1994), Herbert Edelsbrunner (1991), Edward Witten (1986), Harvey M. Friedman (1984), William Thurston (1979), and Charles Fefferman (1977).

—From an NSF news release

Mitrea Awarded Michler Prize

IRINA MITREA of the University of Virginia has been awarded the Ruth I. Michler Memorial Prize. The prize, given by the Association for Women in Mathematics (AWM) and Cornell University, gives a midcareer woman mathematician a residential fellowship in the Cornell University mathematics department without teaching duties.

Mitrea earned her Ph.D. from the University of Minnesota, where she investigated the spectral properties of elliptic layer potentials under the direction of Carlos Kenig and Mikhail Safonov. She was a postdoctoral member of the Institute for Advanced Study in Princeton in 2000–2001, then was appointed assistant professor at Cornell University. She has been affiliated with the University of Virginia since 2004, becoming an associate professor in 2007. She has organized several mathematics programs for girls and serves as a mathematics consultant for the Young Women Leaders Program at the University of Virginia. Her research combines harmonic analysis techniques and partial differential equations methods.

The Michler Prize is awarded annually to a woman who has been recently promoted to the rank of associate professor or an equivalent position in the mathematical sciences. The 2008 award consists of US$42,000, with an additional travel allowance provided by Cornell University.

—From an AWM announcement

Papageorgiou Awarded 2008 Information-Based Complexity Prize

ANARGYROS PAPAGEORGIOU of Columbia University has been awarded the 2008 Information-Based Complexity Prize. The prize consists of US$3,000 and a plaque. The award will be presented at the Seminar on Algorithms and Complexity for Continuous Problems, Schloss Dagstuhl, Germany, in September 2009.

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

—Joseph Traub, Columbia University

Goldwasser Receives Athena Award

SHAFI GOLDWASSER of the Massachusetts Institute of Technology and the Weizmann Institute of Science, Israel, has been named the recipient of the 2008–2009 Athena Award of the Association for Computing Machinery's Committee on Women in Computing (ACM-W).

According to the citation, Goldwasser was selected "for her outstanding research contributions to cryptography, complexity theory, and number theory". She is the coinventor of zero-knowledge proofs, "a key tool in the design of cryptographic protocols. Her work on interactive and zero-knowledge proofs provides underpinnings for secure transmission of information over the Internet."

The Athena Award, which celebrates women researchers who have made fundamental contributions to computer sicence, includes an honorarium of US$10,000, provided by Google Inc.

—From an ACM announcement

Bridgeland and Tong Receive Adams Prize

TOM BRIDGELAND of the University of Sheffield and DAVID TONG of the University of Cambridge have been jointly awarded the Adams Prize by the University of Cambridge. The selected topic for 2008 was quantum fields and strings. According to the prize citation, Bridgeland "has made highly original, deep and wide-ranging contributions to two branches of algebraic geometry, classical and noncommutative, of which a new synthesis has been stimulated by recent developments in string theory." Tong "has made strikingly original advances across a broad range of topics in both quantum field theory and string theory, a particularly notable contribution being to use the D-branes of string theory to understand certain supersymmetric solitons arising in field theory; his work has implications for cosmology as well as quantum physics."

The Adams Prize is awarded each year by the Faculty of Mathematics and St. John's College to a young researcher based in the United Kingdom who is doing first-class international research in the mathematical sciences. The prize is named after the mathematician John Couch Adams and was endowed by members of St. John's College. It is currently worth £13,500 (approximately US$26,500), of which one-third is awarded to the prizewinner on announcement of the prize; one-third is provided to the prizewinner's institution (for research expenses of the prizewinner); and one-third is awarded to the prizewinner on acceptance for publication in an internationally recognized journal of a substantial (normally at least twenty-five printed pages) original survey article of which the prizewinner is an author.

—From a University of Cambridge announcement

Griffiths Awarded Brouwer Prize

PHILLIP A. GRIFFITHS of the Institute for Advanced Study in Princeton has been awarded the 2008 L. E. J. Brouwer Prize of the Royal Dutch Mathematical Society (Koninklijk Wiskundig Genootschap, KWG). He was honored for his work in complex algebraic geometry and differential geometry, including research on algebraic cycles and variations of Hodge structures. He will present the Brouwer Lecture during the European Congress of Mathematics in Amsterdam in July 2008.

The Brouwer Prize is the Netherlands' most prestigious award in mathematics. It was established shortly after the death of the distinguished mathematician L. E. J. Brouwer and is awarded every three years. For each award the Society chooses an important field in mathematics; the 2008 prize was awarded in the field of geometry.

—Herman te Riele, Centrum voor Wiskunde en Informatica

Heller Awarded Templeton Prize

MICHAEL HELLER, a Polish cosmologist and Catholic priest who for more than forty years has developed sharply focused and strikingly original concepts on the origin and cause of the universe, often under intense governmental repression, has won the 2008 Templeton Prize. The prize is valued at £820,000, more than US$1.6 million, and is the world's largest annual monetary award given to an individual.

Heller, 72, professor in the faculty of philosophy at the Pontifical Academy of Theology in Cracow, toiled for years beneath the stifling strictures of the Soviet era. He has become a compelling figure in the realms of physics and cosmology, theology, and philosophy with his cogent and provocative concepts on issues that all of these disciplines pursue, albeit from often vastly different perspectives.

With an academic and religious background that enables him to comfortably and credibly move within each of these domains, Heller's extensive writings have evoked new and important consideration of some of humankind's most profound concepts.

Heller's examination of fundamental questions such as "Does the universe need to have a cause?" engages a wide range of sources who might otherwise find little in common. By drawing together mathematicians, philosophers, cosmologists, and theologians who pursue these topics, he also allows each to share insights that may edify the other without any violence to their respective methodologies.

In a statement prepared for the news conference, Heller described his position as follows: "Various processes in the universe can be displayed as a succession of states in such a way that the preceding state is a cause of the succeeding one…(and) there is always a dynamical law prescribing how one state should generate another state. But dynamical laws are expressed in the form of mathematical equations, and if we ask about the cause of the universe we should ask about a cause of mathematical laws. By doing so we are back in the Great Blueprint of God's thinking the universe, the question on ultimate causality…: 'Why is there something rather than nothing?' When asking this question, we are not asking about a cause like all other causes. We are asking about the root of all possible causes."

Heller's current work focuses on noncommutative geometry and groupoid theory in mathematics, which attempts to remove the problem of an initial cosmological singularity at the origin of the universe. "If on the fundamental level of physics there is no space and no time, as many physicists think," says Heller, "noncommutative geometry could be a suitable tool to deal with such a situation."

Heller plans to dedicate the Templeton Prize money to help create the Copernicus Center in conjunction with Jagiellonian University and the Pontifical Academy of Theology in Cracow to further research and education in science and theology as an academic discipline.

—*From a Templeton Foundation news release*

Ziegler Wins Communicator Award

GÜNTER M. ZIEGLER of the Technische Universität Berlin has been named the recipient of the 2008 Communicator Award given by the Deutsche Forschungsgemeinschaft (DFG; German Research Foundation) and the Donors' Association for the Promotion of Sciences and Humanities in Germany. He was selected "in recognition of his outstanding ability to communicate his research work in discrete mathematics to the general public in a fresh and innovative way."

According to the citation, Ziegler is a "young and unconventional scientist who has succeeded in making a positive impact on the public image and public perception of mathematics, which is still often misunderstood and unpopular.…Ziegler has been actively approaching the public and the media for about ten years, in his endeavors to communicate the importance of mathematics and his particular field, discrete geometry, in a comprehensible manner. In doing so, he has used forms and formats that are not only unusual, but also highly effective, some of which he developed personally. His 'Math Quiz' and 'Science Café', in which he engages in dialogue with scientists from other disciplines, have enjoyed particular success. These events, which regularly attract an audience in the hundreds, are accompanied by numerous articles and columns in newspapers and magazines as well as appearances on radio and television."

The Communicator Award is given to scientists and researchers who have conveyed their research findings to the general public in a particularly varied, original, or creative manner and who have rendered outstanding services to the increasingly important dialogue between the scientific community and the public.

—*From a DFG announcement*

Buchberger Receives ACM Award

BRUNO BUCHBERGER of Johannes Kepler University, Linz, Austria, has been named the recipient of the Paris Kanellakis Theory and Practice Award of the Association for Computing Machinery (ACM). He was recognized "for his role in developing the theory of Groebner Bases, which has become a crucial building block to computer algebra and is widely used in science, engineering, and computer science." His work "has resulted in automated problem-solving tools to address challenges in robotics, computer-aided design, systems design, and modeling biological systems."

The Paris Kanellakis Theory and Practice Award honors specific theoretical accomplishments that have had a significant and demonstrable effect on the practice of computing. This award is endowed by contributions from the Kanellakis family, with additional financial support provided by ACM's Special Interest Groups on Algorithms and Computational Theory, on Design Automation, on Management of Data, and on Programming Languages; the ACM SIG Project Fund; and individual contributions.

—*From an ACM announcement*

Lester and Reys Recognized for Lifetime Achievement in Mathematics Education

FRANK K. LESTER JR. of Indiana University, Bloomington, and ROBERT E. REYS of the University of Missouri are the recipients of 2008 Mathematics Education Trust (MET) Lifetime Achievement Awards for Distinguished Service to Mathematics Education awarded by the National Council

of Teachers of Mathematics (NCTM). They were selected in recognition of their accomplishments in leadership, teaching, and service to mathematics education.

Lester is well known for his research on mathematical problem-solving instruction and his work in mathematics learning, teaching, and curriculum. He has served as a member of NCTM's Board of Directors, Research Advisory Committee, and Standards Impact Research Group and as editor of the *Journal for Research in Mathematics Education*. He organized and participated in the Research Catalyst Conference sponsored by NCTM and the National Science Foundation and has served on a steering committee of the American Educational Research Association special interest group for research in mathematics education. According to the citation, "Lester's work demonstrates his commitment to transforming research results into practice."

Reys's contributions to mathematics education include studies of number sense, calculator use, and estimation in elementary school mathematics. He has been an adviser for "Research within Reach" for elementary and secondary school mathematics. He has served as general editor of five yearbooks and coeditor of a sixth for NCTM and was a member of one of the first NCTM interpretive teams that examined, summarized, and reported results from the National Assessment of Educational Progress in mathematics. (Editor's Note: Reys is a frequent contributor to the *Notices*. His most recent article, "Jobs in mathematics education in institutions of higher education in the United States", appeared in the June/July 2008 issue.)

—From an NCTM announcement

USA Mathematical Olympiad

The 2008 USA Mathematical Olympiad (USAMO) was held April 29 and 30, 2008. The students who participated in the Olympiad were selected on the basis of their performances on the American High School and American Invitational Mathematics Examinations. The twelve highest scorers in the USAMO, listed in alphabetical order, were: DAVID BENJAMIN, West Lafayette, Indiana; TAORAN CHEN, Fresh Meadows, New York; PAUL CHRISTIANO, Saratoga, California; SAMUEL ELDER, Fort Collins, Colorado; SHAUNAK KISHORE, West Chester, Pennsylvania; DELONG MENG, Baton Rouge, Louisiana; EVAN O'DORNEY, Danville, California; QINXUAN PAN, Gaithersburg, Maryland; DAVID ROLNICK, Rupert, Vermont; COLIN SANDON, Essex Junction, Vermont; KRISHANU SANKAR, Hastings-on-Hudson, New York; and ALEX ZHAI, Champaign, Illinois.

In June the twelve USAMO winners will take the team selection test to qualify for the U.S. team. The six students with the highest combined scores from the test and the USAMO will attend the Mathematical Olympiad Summer Program (MOSP) at the University of Nebraska, Lincoln, training to compete in the International Mathematical Olympiad (IMO) to be held in Madrid, Spain, July 10–22, 2008.

—Elaine Kehoe

Moody's Mega Math Challenge Winners Announced

The winners of the 2008 Mega Math Challenge for high school students have been announced. The topic for this year's competition was "Energy Independence Meets the Law of Unintended Consequences: Is Ethanol the Answer?" A team from the High Technology High School in Lincroft, New Jersey, was awarded the Summa Cum Laude Team Prize of US$20,000 in scholarship money. The members of the team were THOMAS JACKSON, KELLY ROACHE, AFANASIY YERMAKOV, and JASON ZUKUS. The team's coach was Raymond Eng, and the title of their project was "Ethanol: Not All It Seems to Be".

The Magna Cum Laude Team Prize of US$15,000 was awarded to a team from Manalapan High School, Manalapan, New Jersey. The team members were MICHAEL BACSIK, JEPHTHAH LIDDIE, JOSHUA NEWMAN, THOMAS SOZZI, and KEVIN TIEN. The team's coach was Jessy Friedman, and the title of their project was "Going Green Does Not Save Green: Corn-Based Ethanol and U.S. Energy Independence".

The Cum Laude Team Prize of US$10,000 in scholarship money was awarded to a team from Shrewsbury High School, Shrewsbury, Massachusetts, for their project "Unintended Consequences: The Ethanol Corn-Nundrum". The team members were ANAND DESAI, RUBY LEE, SHENGZHI LI, ANIRVAN MUKHERJEE, and LINGKE WANG, and they were coached by Catherine McDonough.

A team from Holmdel High School, Holmdel, New Jersey, won the Meritorious Team Prize of US$7,500 for their project "The Hidden Costs of Ethanol". The team consisted of ERIC CHUNG, ALAAP PARIKH, and ASHUTOSH SINGHAL and was coached by Josephine Blaha.

The Exemplary Team Prize of US$5,000 went to a team from Hunterdon Central Regional High School in Flemington, New Jersey. The team members were BRANDON COMELLA, GAWAIN LAU, KELVIN MEI, NEVIN RAJ, and YIWEN ZHAN, and their coach was David Gelb. Their project was titled "Ethanol: The Future of America's Energy Independence?".

The First Honorable Mention Team Prize of US$2,500 went to a team from the Wheeler School in Providence, Rhode Island, for a project titled "Ethanol—Too Good To Be True?". The team members were BRETT MUSCO, CAMERON MUSCO, CHRISTOPHER MUSCO, CHRISTOPHER SHAW, and KARAN TAKHAR, and they were coached by George Lewis.

The Mega Math Challenge invites teams of high school juniors and seniors to solve an open-ended, realistic, challenging modeling problem focused on real-world issues. The top five teams receive awards ranging from US$5,000 to US$20,000 in scholarship money. The competition is sponsored by the Moody's Foundation, a charitable foundation established by Moody's Corporation, and organized by the Society for Industrial and Applied Mathematics (SIAM).

—Elaine Kehoe

National Academy of Sciences Elections

The National Academy of Sciences (NAS) has announced the election of seventy-two new members and eighteen foreign associates. Following are the new members who work in the mathematical sciences: EMILY A. CARTER, Princeton University; HELMUT HOFER, Courant Institute of Mathematical Sciences, New York University; PETER W. JONES, Yale University; FRANK T. LEIGHTON, Massachusetts Institute of Technology; THOMAS M. LIGGETT, University of California, Los Angeles; NATHAN SEIBERG, Institute for Advanced Study; and ELIZABETH A. THOMPSON, University of Washington, Seattle. Elected as foreign associates were H. KEITH MOFFATT, University of Cambridge, and TERENCE C. TAO, University of California, Los Angeles.

—From an NAS announcement

American Academy Elections

Twelve mathematical scientists have been elected to membership in the American Academy of Arts and Sciences for 2008. They are: RUZENA BAJCSY, University of California, Berkeley; EMILY A. CARTER, Princeton University; SUN-YUNG ALICE CHANG, Princeton University; TOBIAS COLDING, Massachusetts Institute of Technology; VLADIMIR DRINFELD, University of Chicago; DAVID GOTTLIEB, Brown University; JOHN GUCKENHEIMER, Cornell University; LARRY V. HEDGES, Northwestern University; RICHARD H. HERMAN, University of Illinois, Urbana-Champaign; DAVID KAZHDAN, Hebrew University, Jerusalem, and Harvard University; JAMES H. SIMONS, Renaissance Technologies; and CHARLES SIMONYI, Intentional Software Corporation.

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

Juha Heinonen (1960–2007)

University of Michigan professor of mathematics Juha Heinonen passed away on October 30, 2007, after a courageous battle with kidney cancer. He was born July 23, 1960, in the small town of Toivakka in central Finland. His father was a lumberjack and well-respected socialist politician for the tiny town. A gifted athlete, Heinonen was the 1976 Finnish national champion in his class in 5-kilometer cross-country skiing. After serving one year in the Finnish army, he enrolled as a student of mathematics at the University of Jyväskylä. His 1987 Ph.D. thesis, directed by Olli Martio, was in nonlinear potential theory.

Heinonen first came to the University of Michigan for a semester as a visiting graduate student in 1985. In 1988 he returned as a three-year postdoctoral assistant professor, and in 1992 he accepted a tenure-track assistant professorship. In 2000 he was promoted to professor.

Considered a scholar of high professional standards, Heinonen was a leading figure in geometric function theory, his main research area. His two books, *Nonlinear Potential Theory of Degenerate Elliptic Equations* (coauthored with T. Kilpeläinen and O. Martio) and *Analysis on Metric Spaces*, have become standard references in their fields. He coauthored more than 60 research papers, many of which contributed to the creation of a new branch of mathematics, now called analysis on metric spaces. Heinonen was a generous and enthusiastic collaborator who was proud of the fact that nearly all of his research publications were joint works. His collaborators admired him for his erudition, his deep mathematical insights, and his never-ending scientific curiosity.

Heinonen directed eight doctoral students, and many students, junior faculty, and young researchers greatly benefited from his patient mentorship and wise tutelage. His expertise was recognized with many awards and fellowships, including a Sloan Fellowship, numerous NSF grants, several visiting appointments, and an Excellence in Research Award from the University of Michigan. For seven years he was an editor of the *Proceedings of the AMS*. In 2002 he was invited to give a talk at the International Congress of Mathematicians in Beijing. He became a member of the Finnish Academy of Science and Letters in 2004.

In 1991 Heinonen married mathematician Karen Smith, who is also a professor at the University of Michigan. They had a daughter, Sanelma, in 1998, and their boy-girl twins, Tapio and Helena, in 2003. Juha was a vibrant, balanced, satisfied person who enjoyed many things in life besides mathematics and sports. He spent his free time studying foreign languages or reading history, biographies, and political commentary. He also loved the outdoors.

Besides his wife and children, Heinonen is survived by his mother, Liisa Heinonen, and his sister, Maritta Nukarinen. Further information is available at `http://www.math.lsa.umich.edu/events/juhaMem.html`.

—From a University of Michigan Department of Mathematics obituary

Murray H. Protter (1918–2008)

Murray H. Protter, a mathematician and former chair of the mathematics department at the University of California at Berkeley, died on May 1, 2008, in Berkeley. He was ninety. The cause was congestive heart failure.

Murray Protter had a great impact on the field of mathematics in the U.S. and internationally, not just from his research achievements involving maximum principles and partial differential equations but also from his leadership skills and his gift for teaching. He had the good fortune to be department chair of the UC Berkeley mathematics

department during the early 1960s, which was shortly after the Soviet Union launched the satellite Sputnik in 1958. During this time it became a national priority to improve science education, and Protter helped to hire many of the great mathematicians of the day, turning Berkeley into one of the best mathematics departments in the U.S. and indeed worldwide. He was also active in the AMS, serving for many years as its treasurer, and also was a longtime editor of the book reviews of the *Bulletin of the AMS.*

Protter was the author of many books, the most famous one written jointly with C. B. Morrey Jr., *Calculus with Analytic Geometry: A First Course*, which was published in 1964. It became the second best-selling text in calculus in the U.S. The research book of which he was the most proud was *Maximum Principles in Differential Equations*, written jointly with Hans Weinberger and first published in 1967. It was reissued by Springer-Verlag in 1999.

Protter joined the Second World War effort after earning his Ph.D. at Brown by calculating the flutter speeds of military aircraft. After this work he joined the faculty at Syracuse University, later moving to the Institute for Advanced Study in Princeton and then to Berkeley, where he remained. At Berkeley he enjoyed a leadership position for many years and was chosen to lead a delegation of mathematicians to the Soviet Union as part of a cultural exchange at the beginning of the period of détente, commonly considered to be the years 1969–1976.

Protter also lent his hand to industry from time to time. One example concerns a time when Shell Oil was drilling for oil and not finding any. Finding the location of oil involved solving the wave equation with certain boundary conditions. This is usually done using computer algorithms, but the drill holes were coming up dry. Protter showed that the wave equation Shell Oil was using had no solution and gave the company the correct formulation of the equation.

Protter grew up in Brooklyn, attended the University of Michigan, and earned his Ph.D. at Brown University in 1946. It was there he met his wife, Ruth Rotman Protter, who survives him. Their first child, Barbara (now of Kansas City), was born in Providence, and then they moved to Syracuse, where his second child, Philip (now of Ithaca), was born. He leaves four grandchildren and three great grandchildren.

—*Philip Protter, Cornell University*

Correction

The May 2008 issue of the *Notices* carried an article about the 2008 prizes of the Association for Women in Mathematics (AWM). The article erroneously stated that the AWM Shafer Prize winner, Alison Miller, was the first woman to receive a gold medal in the International Mathematical Olympiad (IMO). In fact, Miller is the first female member of the United States IMO team to have won a gold medal, which she received in 2004. In 2007 another woman member of the U.S. team, Sherry Gong, also won a gold medal.

The first woman ever on a U.S. team was Melanie Wood, who was on the team in 1998 and 1999 and won silver medals both times. She also received the AMS-MAA-SIAM Morgan Prize in 2004 and the Schafer Prize in 2002.

A brief examination of information on the Internet appears to indicate that the woman who has won the most gold medals in the IMO is Evgenia Malinnikova, who was on the Russian team and won gold medals in 1989, 1990, and 1991. She was also the top IMO competitor at that time, as she came within one point of having three perfect scores in a row (perfect scores are much rarer than gold medals). Also noteworthy are Maryam Mirzakhani, who as a member of the Iranian team received gold medals in 1994 and 1995, and Ana Caraiani, who was on the Romanian team and received gold medals in 2002 and 2003. Caraiani was the Schafer Prize winner in 2007.

—*Allyn Jackson*