Mathematics People

Gilbert Receives NAS Award

ANNA C. GILBERT of the University of Michigan, Ann Arbor, has received the 2008 National Academy of Sciences (NAS) Award for Initiatives in Research. According to the prize citation, Gilbert was honored for "innovative algorithms using wavelets and sampling techniques and their impact on data analysis and sparse approximation." The award, which carries a cash prize of US$15,000, is presented annually to recognize innovative young scientists and to encourage research likely to lead to new capabilities for human benefit. For 2008 the award was given in the fields of computational science and applied mathematics. It was established by AT&T Bell Laboratories in honor of William O. Baker and is supported by Alcatel-Lucent.

—From an NAS announcement

Feigenbaum Awarded Heineman Prize

MITCHELL J. FEIGENBAUM of Rockefeller University has been awarded the 2008 Dannie Heineman Prize in Mathematical Physics "for developing the theory of deterministic chaos, especially the universal character of period doubling, and for the profound influence of these discoveries on our understanding of nonlinear phenomena in physics."

The prize carries a cash award of US$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 Institute of Physics (AIP) and the American Physical Society (APS). The prize is presented annually.

—From an APS announcement

Chavez Receives AAAS Mentor Award

CARLOS CASTILLO CHAVEZ of Arizona State University has received the 2007 Mentor Award from the American Association for the Advancement of Science (AAAS) for his efforts to help underrepresented students earn doctoral degrees in the sciences.

Chavez, who earned his Ph.D. from the University of Wisconsin, has served as dissertation adviser for four Hispanic Americans who earned their doctorates in mathematics or the biological sciences. Another eleven Hispanic Americans whom he mentored in an undergraduate research program have gone on to earn doctorates in the biological sciences, mathematics, statistics, or bioinformatics at various institutions. He has also raised funding for and run a summer research program, the Mathematical and Theoretical Biology Institute, aimed at encouraging Hispanic American and Native American undergraduate students to enter Ph.D. programs with an emphasis on mathematical or computational biology. As a result of this program, fifty-nine Hispanic Americans and Native Americans have gone on to graduate programs.

The AAAS Mentor Award honors members of the AAAS who have mentored and guided significant numbers of underrepresented students toward Ph.D. degrees in the sciences and who have demonstrated scholarship, activism, and community building on behalf of underrepresented groups, including women of all racial or ethnic groups; African American, Native American, and Hispanic men; and people with disabilities. This award recognizes individuals in the early or mid-career stage who have mentored students for less than twenty-five years. The recipient receives US$5,000 and a commemorative plaque.

—From an AAAS announcement

Schedler Receives AIM Five-Year Fellowship

TRAVIS SCHEDLER of the University of Chicago has been named the recipient of the 2008 American Institute of Mathematics (AIM) Five-Year Fellowship.

Schedler will complete his Ph.D. at the University of Chicago under the direction of Victor Ginzburg. He works in the area of noncommutative algebraic geometry. His thesis defines and applies a new formalism of differential operators for associative algebras. Other work involves computing Hochschild and cyclic homology of algebras associated with quivers. He has written or coauthored eleven papers, one of which has appeared in the *Journal of the American Mathematical Society*. He received his A.B.

from Harvard in 2002 and spent a year of graduate study at the École Normale Supérieure.

—From an AIM announcement

2008 Clay Awards Announced

The Clay Mathematics Institute (CMI) has announced the recipients of the 2008 Clay Research Fellowships and Research Awards.

Clay Research Fellowships

SPYROS ALEXAKIS of Princeton University received his Ph.D. from Princeton in 2005. In his thesis, he proved a special case of the Desser-Schwimmer conjecture in conformal geometry, and he has recently proved the full case. This conjecture characterizes all pointwise Riemannian invariant polynomials in the metric tensor and its derivatives whose integrals over a compact manifold without boundary are invariant under conformal deformations.

ADRIAN IOANA of the California Institute of Technology received his Ph.D. in 2007 from the University of California, Los Angeles. In a 2006 paper he showed that any group that contains a copy of the free group on two letters has uncountably many orbit inequivalent actions.

XINYI YUAN will receive his Ph.D. degree in 2008 from Columbia University. In 2006 he proved an arithmetic analogue of a theorem of Siu and derived a natural sufficient condition for the case in which the orbit under the absolute Galois group is equidistributed.

Clay Research Fellows are appointed for terms ranging from two to five years; graduating doctoral students and mathematicians within three years of receiving the doctoral degree are eligible for the fellowships.

Clay Research Awards

The 2008 Clay Research Awards have been presented to CLIFFORD TAUBES of Harvard University for his proof of the Weinstein conjecture in dimension three, and to CLAIRE VOISIN of the Centre National de la Recherche Scientifique, the Institut des Hautes Études Scientifiques, and the Institut Mathématique de Jussieu for her disproof of the Kodaira conjecture.

The Weinstein conjecture is a conjecture about the existence of closed orbits for the Reeb vector field on a contact manifold. A contact manifold is an odd-dimensional manifold with a one-form A such that A wedged with the n-th exterior power of dA is everywhere nonzero. In particular, the kernel of A is a maximally non-integrable field of hyperplanes in the tangent bundle. The Reeb vector field generates the kernel of dA and pairs to one with A. Alan Weinstein asked some thirty years ago whether this vector field must, in all cases, have a closed orbit. (The unit sphere in complex n-space with A the annihilator of the maximal complex subspace of the real tangent space is an example of a contact manifold and contact 1-form. In this case, the orbits of the Reeb vector field generate the circle action whose quotient gives the associated complex projective space.) Note, by contrast, that there exist non-contact vector fields, even on the 3-sphere, with no closed orbits. These are the counterexamples (due to Schweitzer, Harrison, and Kuperberg) to the Seifert conjecture. Hofer affirmed the Weinstein conjecture in many 3-dimensional cases, for example the three-sphere and contact structures on any 3-dimensional, reducible manifold. Taubes's affirmative solution of the Weinstein conjecture for any 3-dimensional contact manifold is based on a novel application of the Seiberg-Witten equations to the problem.

The Kodaira conjecture was formulated in 1960, when Kunihiko Kodaira showed that any compact complex Kähler surface can be deformed to a projective algebraic surface. For the proof, Kodaira used his classification theorem for complex surfaces. The conjecture asks whether Kähler manifolds of higher dimension can be deformed to a projective algebraic manifold. Voisin constructs counterexamples: in each dimension four or greater there is a compact Kähler manifold that is not homotopy equivalent to a projective one. For dimension at least six, she gives examples that are also simply connected. A later result gives a substantial strengthening: in any even dimension ten or greater, there exist compact Kähler manifolds, no bimeromorphic model of which is homotopy equivalent to a projective algebraic variety. Distinguishing the homotopy type of projective and nonprojective Kähler manifolds is achieved through novel Hodge-theoretic arguments that place subtle restrictions on the topological intersection ring of a projective manifold.

—From a CMI announcement

Iyama Wins ICRA Award

OSAMU IYAMA of Nagoya University has been selected to receive the first ICRA Award from the International Conferences on Representations of Algebras (ICRA). Iyama was honored for "original and influential work on developing a 'higher' theory for almost split sequences and Auslander correspondence and his subsequent work on Calabi-Yau categories, which have strong connections with the cluster algebras of Fomin-Zelevinsky."

The ICRA conference series was established in 1974 to bring together both experts and young researchers in the field of representations of finite-dimensional algebras. The award will be given at each conference session to a young mathematician who has done outstanding work in the field.

—From an ICRA announcement

National Academy of Engineering Elections

The National Academy of Engineering (NAE) has announced the election of sixty-five new members and nine foreign associates, including six whose work involves the

mathematical sciences. Their names, institutions, and the research for which they were elected follow.

JON M. KLEINBERG, Cornell University, for contributions to the understanding of the structure and behavior of the World Wide Web and other complex networks; PRABHAKAR RAGHAVAN, Yahoo! Research, Santa Clara, California, for significant contributions to algorithms and the structure of the World Wide Web; VLADIMIR ROKHLIN, Yale University, for the development of fast multipole algorithms and their application to electromagnetic and acoustic scattering; and JAMES A. SETHIAN, University of California, Berkeley, for the development of efficient methods of tracking moving interfaces. Elected as foreign associates were ARTHUR JOHN ROBIN GORELL MILNER, University of Cambridge, for fundamental contributions to computer science, including the development of LCF, ML, CCS, and the pi-calculus; and EKKEHARD RAMM, University of Stuttgart, for contributions to the finite element analysis of plates and shells and leadership in computational mechanics.

—From an NAE announcement

Alex Rosenberg (1926–2007)

Alex Rosenberg died on October 27, 2007, in Schwerte, Germany, his home for the last decade. He was born in Berlin, Germany, on December 5, 1926. His family fled Germany in August 1939, first to Les-Plans-Sur-Bex, Switzerland, where they stayed for almost a year. After a brief stay in England, the family resettled in Ontario.

Alex studied at the University of Toronto. He earned a B.A. (math/physics) in 1948 and stayed on for an M.A. in 1949. Moving to the University of Chicago for his further graduate study, Rosenberg obtained his Ph.D. in 1951 under the supervision of Irving Kaplansky.

In 1961 Rosenberg joined the faculty at Cornell University as professor of mathematics and remained there for a quarter of a century. He was chairman of the mathematics department from 1966 to 1969, when it was at its largest. Later, in 1986, he moved to the University of California, Santa Barbara, as chair of the department of mathematics. A few years after his retirement in 1994, he moved back to Germany, where he lived until his death.

Rosenberg made fundamental contributions to algebra by applying newly developed homological techniques to Galois theory and quadratic forms as well as to other areas. He was also an active member of the mathematical community, holding many important posts in the leadership of both the AMS and the Mathematical Association of America, including serving as editor of the *Proceedings of the AMS* (1960–65).

Alex Rosenberg, whose occasionally gruff manner masked his wit, kindness, and generosity, was a major figure in the post-World War II U.S. mathematical community whose wise counsel was crucial to mathematics in the U.S. For additional information, see `http://www.spelman.edu/~colm/alexrosenbergobit.html`.

—Lance Small, University of California, San Diego