Mathematics People

Kleinberg Receives MacArthur Fellowship

JON KLEINBERG of Cornell University has been awarded a MacArthur Foundation Fellowship for 2005. The prize citation calls Kleinberg "a computer scientist with a reputation for tackling important, practical problems and, in the process, deriving deep mathematical insights."

Kleinberg's research interests range from computer networking analysis and routing to data mining to comparative genomics and protein structure. He is best known for his contributions to two aspects of network theory: "small worlds" and searching the World Wide Web. The "small world" concept, originated by psychologist Stanley Milgram, states that any two people are linked by a relatively small number of connections among mutual acquaintances. Kleinberg extended this concept by introducing the notion of navigability—essentially, the information structure of the network necessary for individuals to make distant connections efficiently based solely on local information. He proved that, although certain architectures can be computationally efficient, no algorithm can find the shortest path in networks with short, random connections. In addition, Kleinberg has developed an algorithm for identifying the structure of website interactions; his algorithm distinguishes "authority" sites, which contain definitive information, from "hub" sites, which refer to authority sites using hyperlinks.

Jon Kleinberg received his A.B. (1993) from Cornell University and his Ph.D. (1996) from the Massachusetts Institute of Technology. He has held several research positions at IBM and has continued to be a member of the visiting faculty program at the IBM Almaden Research Center since 1998. He has been at Cornell University since 1996. The MacArthur Foundation Fellowship Program awards five-year, unrestricted fellowships of US$500,000 to individuals across all ages and fields who show exceptional merit and promise of continued creative work.

—From a MacArthur Foundation news release

NSF CAREER Awards Made

The Division of Mathematical Sciences (DMS) of the National Science Foundation (NSF) has honored fourteen mathematicians in fiscal year 2005 with Faculty Early Career Development (CAREER) awards. The NSF established the awards to support promising scientists, mathematicians, and engineers who are committed to the integration of research and education. The grants run from four to five years and range from US$200,000 to US$500,000 each. The 2005 CAREER grant awardees and the titles of their grant projects follow.

MARK EMBREE, Rice University: Design and Analysis of Restarted Iterative Methods for Linear Systems, Eigenvalue Problems, and Model Reduction; EZRA MILLER, University of Minnesota, Twin Cities: Discrete Structures in Continuous Contexts; DAVID BEN-ZVI, University of Texas, Austin: Representation Theory on Curves; HELGE JENSSEN, Pennsylvania State University: Large and Multidimensional Solutions of Conservation Laws; PETER KRAMER, Rensselaer Polytechnic Institute: Stochastic Dynamical Models in Microbiology; JONATHAN MATTINGLY, Duke University: Stochastic Analysis and Numerics in Partial Differential Equations and Extended Dynamical Systems; TIEFENG JIANG, University of Minnesota, Twin Cities: Random Matrices and Related Topics; ANNA VAINCHTEIN, University of Pittsburgh: Lattice Models of Martensitic Phase Transitions; THOMAS SCANLON, University of California, Berkeley: Geometric and Algebraic Model Theory; MATTIAS JONSSON, University of Michigan, Ann Arbor: A Unified Study of Singularities; SAMUEL KOU, Harvard University: Stochastic Modeling and Inference in Biophysics; JORDAN ELLENBERG, University of Wisconsin, Madison: Rational Points on Varieties and Nonabelian Galois Groups; WEI BIAO WU, University of Chicago: Asymptotics of Random Processes and Their Applications; and YUHONG YANG, University of Minnesota, Twin Cities: Adaptive Regression for Dependent Data by Combining Different Procedures.

—Elaine Kehoe

Viana Awarded ICTP/IMU Ramanujan Prize

MARCELO VIANA of the Instituto de Matemática Pura e Aplicada (IMPA), Brazil, has been awarded the first Srinivasa Ramanujan Prize for Young Mathematicians from Developing Countries by the Abdus Salam International Centre for Theoretical Physics (ICTP) and the International Mathematical Union (IMU). Viana was honored for his outstanding contributions to the field of dynamical systems. He has played a key role in the development of mathematics at IMPA and in Brazil.

The Ramanujan Prize is funded by the Niels Henrik Abel Memorial Fund and is designed to honor researchers under forty-five years of age who have conducted outstanding research in developing countries. The prize carries a cash award of US$10,000 and a travel allowance to visit ICTP to deliver a prize lecture.

—From an ICTP announcement

Bhargava and Soundararajan Awarded SASTRA Ramanujan Prizes

MANJUL BHARGAVA of Princeton University and KANNAN SOUNDARARAJAN of the University of Michigan have been awarded the first annual SASTRA Ramanujan Prizes of the Shanmugha Arts, Science, Technology Research Academy (SASTRA) of South India.

The prize citations are as follows.

"Manjul Bhargava is awarded the 2005 SASTRA Ramanujan Prize for his phenomenal contributions to number theory, most notably for his discovery of higher order composition laws, for applying these laws to solve new cases of one of the fundamental questions of number theory, that of the asymptotic enumeration of number fields of a given degree d, and for making progress on the problem of finding the average size of ideal class groups of number fields and the related conjectures of Cohen and Lenstra. All this stems from his Ph.D. thesis written under the direction of Andrew Wiles of Princeton University and published as a series of papers in the *Annals of Mathematics*. Bhargava's research has created a whole new area of research in a classical topic that has seen very little activity since the time of Gauss."

"Kannan Soundararajan is awarded the 2005 SASTRA Ramanujan Prize for his brilliant contributions to several areas in analytic number theory that include combinatorial and multiplicative number theory, the Riemann zeta function, Dirichlet L-functions, the analytic theory of automorphic forms, and the Katz-Sarnak theory of symmetric groups associated with families of L-functions. Among other things, the prize recognizes his resolution of a conjecture of Ron Graham in combinatorial number theory in collaboration with R. Balasubramaniam, his fundamental results on the distribution of zeros of the Riemann zeta function, both of these being his undergraduate research at the University of Michigan, as well his Ph.D. thesis written under the direction of Peter Sarnak of Princeton University, in which Soundararajan proved the spectacular result that more than 7/8-ths of quadratic Dirichlet L-functions have no zeros at the critical point $s = 1/2$. The prize also recognizes Soundararajan's joint work with Brian Conrey that a positive proportion of Dirichlet L-functions have no zeros on the real axis within the critical strip, his joint work with Ken Ono providing a conditional proof of a conjecture of Ramanujan on the values of a certain quadratic form, and his recent work with Hugh Montgomery on the distribution of primes in short intervals."

The prize was awarded at the International Conference on Number Theory and Mathematical Physics, held December 19–22, 2005, at SASTRA. Both recipients gave invited talks on their work.

The SASTRA Ramanujan Prize carries a cash award of US$10,000 and is given for outstanding contributions by individuals under the age of thirty-two (the age Ramanujan was when he died) in areas of mathematics that were broadly influenced by Ramanujan's work.

The prize committee consisted of Krishnaswami Alladi (chair), University of Florida; Manindra Agrawal, Indian Institute of Technology; George Andrews, Pennsylvania State University; Jean-Marc Deshouillers, University of Bordeaux; Tom Koornwinder, University of Amsterdam; James Lepowsky, Rutgers University; and Don Zagier, Max Planck Institute for Mathematics, Bonn, and Collège de France.

—Krishnaswami Alladi, Chair,
SASTRA Ramanujan Prize Committee

Bhargava and Dencker Receive Clay Awards

The Clay Mathematics Institute (CMI) has presented its Clay Research Awards for 2005 to MANJUL BHARGAVA, Princeton University, and NILS DENCKER, Lund University, Sweden. According to the prize citations, Bhargava was recognized "for his discovery of new composition laws for quadratic forms and for his work on the average size of ideal class groups," and Dencker was honored "for his complete resolution" of a 1970 conjecture made by Treves and Nirenberg that "posits an essentially geometric necessary and sufficient condition…for a pseudodifferential operator of principal type to be locally solvable."

The CMI is a private nonprofit foundation dedicated to increasing and disseminating mathematical knowledge. This year's research awards were presented on October 11, 2005, at Oxford University.

—From a CMI announcement

Alfred W. Goldie (1920–2005)

Alfred W. Goldie, whose eponymous theorem changed the face of noncommutative ring theory, died on October 8, 2005, in hospital, near his home in Bowness-on-Windermere, England. According to his family, his death was the result of a heart attack following surgery earlier that week.

Goldie's Theorem and its proof initiated the systematic study of noncommutative noetherian rings by linking their properties, through the technique of forming a ring of fractions, to semisimple rings with the descending chain condition—a class well understood via the Wedderburn theorems. Goldie's insights found applications to the study of infinite-dimensional representations of finite-dimensional Lie algebras, for example.

Alfred Goldie was born on December 10, 1920, in Staffordshire, England. He was educated at Wolverhampton Grammar School and then at St. Johns College, Cambridge. During World War II he did research on interior ballistics. Goldie's only "formal" study of algebra was several meetings with Philip Hall, the eminent British algebraist.

After positions at Nottingham and Newcastle (where he proved Goldie's theorem), Goldie became a research professor at the University of Leeds in 1963 and remained until his retirement in 1986. At Leeds he continued his work in algebra, building a "school" in ring theory, hosting many visitors, and organizing memorable conferences. Goldie visited the U.S. many times, with extended stays at Yale, Tulane, and the University of California at San Diego.

Alfred Goldie approached his work with optimism and with no fear of the really hard problems.

—Lance Small, University of California, San Diego