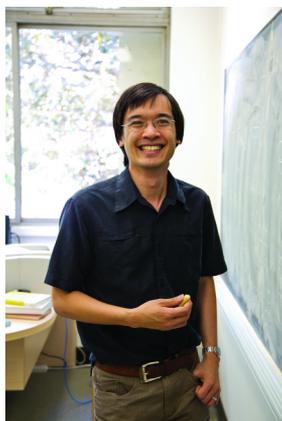


# Mathematics People

## Tao Awarded Royal Medal

TERENCE TAO of the University of California Los Angeles has been awarded the 2014 Royal Medal for Physical Sciences by the Royal Society of London “for his many contributions to math, including those in harmonic analysis, prime number theory, partial differential equations, combinatorics, computer science, statistics, representation theory, and much more”.



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Terence Tao

Tao was awarded the Fields Medal in 2006 and a Breakthrough Prize worth US\$3 million in 2014. Among his many honors and awards are the Salem Prize (2000), the AMS Bôcher Prize (2002) and Conant Award (2005), the Clay Research Award (2003), the SASTRA Ramanujan Prize (2006), the Ostrowski Prize (2007), the National Science Foundation Waterman Award (2008), the King Faisal International Prize (2010), and a MacArthur Fellowship (2007–2011).

The Royal Society, based in London and founded in 1660, is the oldest scientific academy in continuous existence. The organization awards three Royal Medals each year in the physical, biological, and applied sciences.

—Elaine Kehoe

## Lipton Awarded Knuth Prize

RICHARD J. LIPTON of the Georgia Institute of Technology has been named the recipient of the 2014 Donald E. Knuth Prize for inventing new computer science and mathematical techniques to tackle foundational and practical problems in a wide range of areas in graph algorithms,

computation, communication, program testing, and DNA computing.

According to the prize citation, “Together with ACM A. M. Turing Award winner Robert Tarjan, Lipton developed the planar separator theorem. It shows that a small number of intersections can be efficiently found in any road network, which, when removed, will split the network into disconnected pieces of at most half its original size. This operation facilitates a very efficient ‘divide and conquer’ approach to solving problems on such networks by breaking down a problem into two or more subproblems of the same or related type.

“Lipton pioneered the design of algorithms that make random choices in order to solve computational problems, particularly as a way to test programs. He confronted the ‘chicken and egg’ problem that can occur when building software designed to solve a complex problem: how to check the answers that a program produces without a way to compute the correct answers. In solving complex algebraic problems, Lipton showed that it was sufficient to check a program by running it against itself on randomly chosen but related inputs and comparing the results for consistency.

“Working with another ACM Turing Award recipient, Richard Karp, Lipton developed a fundamental theorem in circuit complexity. It demonstrated that NP-complete problems are unlikely to be efficiently solved by the best of algorithms even when given specially designed hardware. This critically important class of problems in computational complexity is the subject of intensive research. A purely algorithmic solution to this problem has long been the holy grail of computer science and is the object of a million-dollar challenge from the Clay Mathematics Institute.

“Lipton was an early developer of communication complexity, the study of the number of bits of communication needed for agents to solve computational tasks. He and his coauthors developed a multiparty version based on analogues of ‘hat puzzles’ in recreational mathematics. This work showed its relevance for understanding the complexity of computations and gave surprising solutions to the problems that arise. Lipton is also one of the original pioneers in DNA computing, which uses the combination

and replication of the vast numbers of DNA strands that fit in a test tube as a basis for parallel computation.”

The Knuth Prize, named in honor of Donald E. Knuth of Stanford University, is given every eighteen months by the Association for Computing Machinery (ACM) Special Interest Group on Algorithms and Computation Theory (SIGACT) and the Institute of Electrical and Electronics Engineers (IEEE) Technical Committee on the Mathematical Foundations of Computing. It carries a cash award of US\$5,000.

—From an ACM announcement

## Mirzakhani and Scholze Receive Clay Research Awards

MARYAM MIRZAKHANI of Stanford University and PETER SCHOLZE of the University of Bonn have been selected to receive 2014 Clay Research Awards by the Clay Mathematics Institute (CMI).

Mirzakhani was recognized for her many and significant contributions to geometry and ergodic theory, in particular to the proof of an analogue of Ratner’s theorem on unipotent flows for moduli of flat surfaces. She was awarded a Fields Medal this year.

Scholze was honored for his many and significant contributions to arithmetic algebraic geometry, particularly in the development and applications of the theory of perfectoid spaces. He was appointed a Clay Research Fellow for a term of five years in 2011 and received the 2013 SASTRA Ramanujan Prize.

The CMI presents Clay Research Awards annually to recognize major breakthroughs in mathematical research.

—From a CMI announcement

## AWM Hay and Humphreys Awards Announced

T. CHRISTINE STEVENS, associate executive director of the AMS and formerly of St. Louis University, has been chosen the recipient of the Louise Hay Award of the Association for Women in Mathematics (AWM). She was cofounder and codirector (with James R. C. Leitzel) of Project NEXT (New Experiences in Teaching), a program of the Mathematical Association of America (MAA) that helps new faculty members transition into full-time teaching. She served as the

program’s sole director from 1998 to 2009. She has made numerous contributions to mathematics education as an AMS/MAA/SIAM Congressional Science Fellow, as chair of the MAA’s Science Policy Committee, and as a member of the Society for Industrial and Applied Mathematics (SIAM) Science Policy Committee and the MAA Committee on Minority Participation in Mathematics. She has also served as an associate program director for the Teacher Enhancement Program at the National Science Foundation (NSF). She received her PhD from Harvard University. The Louise Hay Award recognizes outstanding achievements in any area of mathematics education.

RUTH HAAS of Smith College has been selected as the recipient of the AWM M. Gweneth Humphreys Award. According to the prize citation, Haas “has nurtured and supported a generation of women mathematics students at Smith. An impressive alumnae body attests enthusiastically to the crucial role Haas played in their decision to major in mathematics, attend graduate school, and ultimately pursue careers in the mathematical sciences.” She was instrumental in establishing the Center for Women in Mathematics and the postbaccalaureate program at Smith, as well as an undergraduate research course, the annual Women in Mathematics in the Northeast conference, and other programs. The award recognizes the commitment to and influence of M. Gweneth Humphreys on undergraduate students of mathematics.

—From AWM announcements



Maryam Mirzakhani

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## Godin Receives 2014 CMS Graham Wright Award

SHAWN GODIN of Cairine Wilson Secondary School, Ottawa, Ontario, has been named the recipient of the 2014 Graham Wright Award for Distinguished Service by the Canadian Mathematical Society (CMS). Godin has contributed to provincial tests, served as a mathematics consultant, written and reviewed district-wide exams, and consulted on math texts. Working with universities, he helped establish university and high school dialogues and to craft mathematics competitions and math camps. He has also worked with the Ontario Ministry of Education to create technology-based activities and provide support materials for students and teachers implementing changes to the mathematics syllabus.

The Graham Wright Award for Distinguished Service is presented annually to an individual who has made significant contributions to the Canadian mathematics community and in particular the CMS.

—From a CMS announcement

## Thamwattana Awarded 2014 Mitchell Medal

NGAMTA (NATALIE) THAMWATTANA of University of Wollongong has been awarded the 2014 J. H. Mitchell Medal of

the Australian Mathematical Society for work that involves the interaction of atomic and molecular nanostructures, producing accurate and simply expressed analytical results for calculations that had previously been attempted only by numerical methods. The award is given for distinguished research in applied and/or industrial mathematics, with a significant proportion of the research work having been carried out in Australia and/or New Zealand.

—From an ANZIAM announcement

## NCTM Lifetime Achievement Awards

The National Council of Teachers of Mathematics (NCTM) has presented Mathematics Education Trust (MET) Lifetime Achievement Awards for Distinguished Service to Mathematics Education to MIRIAM A. LEIVA, University of North Carolina, Charlotte, and CHRISTIAN R. HIRSCH, Western Michigan University. Leiva was the founding president of TODOS: Mathematics for All. According to the prize citation, “she has been an avid, persuasive spokesperson on issues that affect the mathematics achievement of all students and in particular of Latino/a students in the United States. She is recognized as that rare person who makes everyone consider the disparities that exist in mathematics education for underrepresented, underserved students, and through her leadership, she has provided a call to action and reform of that environment. That mission—the mission of TODOS—still remains at the forefront of her leadership efforts today.” She has been a member of the *Journal for Research in Mathematics Education* editorial panel and of the Research Advisory Committee and the Nominations and Elections Committee of the NCTM. She has served on the NCTM *Principles to Actions* author committee, with particular emphasis on equity. She has been a member of the NCTM Board of Directors. Other honors she has received include the Ross Taylor/Glenn Gilbert Memorial Award for Excellence in Mathematics Education from the National Council of Supervisors of Mathematics, the Iris Carl Equity and Leadership Award from TODOS, the North Carolina Diamante Award for contributions to the Hispanic/Latino community in the state, and the Rankin Award, which recognizes and honors individuals for their outstanding contributions to the North Carolina Council of Teachers of Mathematics (NCCTM) and to mathematics education in North Carolina.

Hirsch “was the driving force behind the Core-Plus Mathematics Project (CPMP), which, with support from the National Science Foundation, developed a research-based high school curriculum organized around mathematical strands of algebra and functions, statistics and probability, geometry and trigonometry, and discrete mathematics. This integrated curriculum was the first such curriculum to have a significant impact on national adoptions, and over a period of more than twenty years, it has moved to second and subsequent editions, including a new Common Core State Standards (CCSS) edition.” He has served

on the NCTM Board of Directors, was a member of the first Commission on Standards for School Mathematics, and chaired the grades 9–12 working group for the NCTM’s *Curriculum and Evaluation Standards for School Mathematics* (1989). He was editor of the 1985 Yearbook and the Addenda Series for grades 9–12 and was general editor of the 1990–1992 Yearbooks. He edited several additional NCTM publications and wrote numerous articles appearing in the NCTM journals and those of other professional organizations. He served as a referee for both research and professional practice journals within and outside NCTM, chaired the NCTM review group for College Board Standards for Success in College Mathematics and Statistics, and was both a member and chair of the Education Materials Committee.

—From NCTM announcements

## Pi Mu Epsilon Student Paper Presentation Awards

Pi Mu Epsilon (PME), the US honorary mathematics society, makes annual awards to recognize the best papers by undergraduate students presented at a PME student paper session. PME held a session in conjunction with the Mathematical Association of America MathFest held July 31–August 3, 2014, in Hartford, Connecticut. The AMS and the American Statistical Association sponsor awards to student speakers for excellence in exposition and research. Each awardee received a check for US\$150. The names, institutions, and paper titles of the award-winning students follow.

MARCUS ELIA, State University of New York, Geneseo, “The Collatz conjecture”; MARISSA HARTZHEIM, St. Norbert College, “A particular polarity, part I”; TAYLOR MILLER, St. Norbert College, “A particular polarity, part II”; CRYSTAL MACKEY, Youngstown State University, “Factorization theory of numerical monoids”; JONATHAN MARINO, Roanoke College, “Integer compositions applied to the probability analysis of blackjack and infinite deck assumption”; ROBERT LEHR, Southwestern University, “An irrational decomposition of generalized Fibonacci numbers”; SAMANTHA PARSONS, Roanoke College, “Protecting confidentiality and scientific integrity through synthetic data and mediator servers”; MATTHEW BUHR, University of South Dakota, “The flour beetle: A discrete mathematical model”; MAX GOERING, Kansas State University, “Modulus of families of walks on graphs”; DANIEL MILLER, Texas A&M University, “Data-driven forecasting of available and required energy for a solar water heating system”; HEATHER GRONEWALD, Southwestern University, “Computing cophylogenetic invariants”; ERIC SHEHADI, Youngstown State University, “Safeguard fair voting: Mathematically diagnosing gerrymanders”; ERIC LAI, University of California Irvine, “The distance between finite groups”; ELIZABETH GRECO, Kenyon College, “Brownian motion in the complex plane”; DAYNA MANN, Pepperdine University, “An individual-based model of chaparral vegetation response to frequent wildfires”; ANDRE BUNTON, University