Mathematics People

Behrend Awarded 2014 CRM-Fields-PIMS Prize

KAI BEHREND of the University of British Columbia has been awarded the CRM-Fields-PIMS prize for his work in algebraic geometry. According to the prize citation, "his contributions to the subject are noted both for their depth and scope. He has obtained fundamental results in the theory of algebraic stacks, Gromov–Witten theory and the study of Donaldson–Thomas invariants. In particular, his pioneering works on the construction of a 'virtual fundamental class' played a key role in laying the algebraic foundations of the Gromov–Witten theory. Later, he made a breakthrough in the study of the Donaldson–Thomas invariants by showing that, for certain spaces, the degree of the virtual fundamental class could be expressed as the topological Euler characteristic weighted by a natural constructible function, depending only on the intrinsic properties of the space. This function is now widely known as Behrend's function. It allowed the use of motivic methods to compute Donaldson–Thomas invariants and made it possible to obtain their categorified and motivic versions, which is currently among the hottest trends in the subject. In his earlier work, Professor Behrend obtained an important generalization of the Lefschetz trace formula for algebraic stacks, presently known as Behrend's trace formula. The ideas put forward by Kai Behrend have already proven to be immensely influential and will undoubtedly have a lasting impact on this area of mathematics."

The CRM-Fields-PIMS Prize recognizes exceptional achievement in the area of mathematical sciences. It is awarded by the Centre de Recherches Mathématiques (CRM), the Fields Institute, and the Pacific Institute for Mathematical Sciences (PIMS).

—From a CRM announcement

IEEE Control Systems Awards Given

The Institute of Electrical and Electronics Engineers awards the Control Systems Award annually. TAMER BASAR of the University of Illinois at Urbana-Champaign was awarded the 2014 award "for seminal contributions to dynamic games, stochastic and risk-sensitive control, control of networks, and hierarchical decision making". BRUCE FRANCIS of the University of Toronto received the 2015 award "for pioneering contributions to H-infinity, linear-multivariable, and digital control". The award recognizes an individual's "outstanding contributions to control systems engineering, science, or technology" and considers the seminal nature, depth, and breadth of contributions, as well as singular achievement and practical impact.

—From an IEEE announcement

Corwin Awarded Packard Fellowship

IVAN CORWIN of Columbia University has been awarded a Packard Fellowship by the David and Lucile Packard Foundation. Corwin's work attempts to unify algebraic structures within mathematics, to build bridges between these structures and domains of physics, and to discover universal phenomena within these domains. He has uncovered universal distributions (modern day parallels of the bell curve) in models of interface growth, traffic flow, mass transport, turbulence, and shock-fronts. The Packard Fellowships provide young scientists early in their careers with flexible funding and the freedom to take risks and explore new frontiers in their fields of study.

—From a Packard Foundation announcement

Leverhulme Prizes Awarded

Six mathematicians have been awarded Leverhulme Prizes by the Leverhulme Trust. ALEXANDROS BESKOS of University College London was recognized for his work in computational statistics and theory and applications of Monte Carlo methods. DANIEL KRAL of the University of Warwick was honored for his work in combinatorics. DAVID LOEFFLER of the University of Warwick and SARAH ZERBES of University College London were honored for their joint work in number theory, particularly construction of Euler system associated with convolution of modular forms. RICHARD SAMWORTH of the University

of Cambridge was recognized for his foundational and methodological contibutions to many areas of statistics. CORRINA ULCIGRAI of the University of Bristol was honored for her major contributions to ergodic theory and dynamical systems. The Leverhulme Trust awards Philip Leverhulme Prizes to outstanding researchers in a UK institution of higher education or research whose work has already attracted international recognition and whose future careers are exceptionally promising. Each year a number of disciplines are chosen for the awards; for 2014 the subject areas were mathematics and statistics. Prizes awarded are worth £100,000 (approximately US$156,000) and are to be used, over a two- to three-year period, to advance prizewinners' research.

—From a Leverhulme Trust announcement

Prizes of the Math Society of Japan

The Mathematical Society of Japan (MSJ) has awarded the following prizes for 2014.

The 2014 Spring Prize was awarded to YUKINOBU TODA of the University of Tokyo for his outstanding contributions to the study of derived categories of algebraic varieties. The Spring Prize is awarded to researchers under forty years of age who have obtained outstanding mathematical results.

The 2014 Autumn Prize was awarded to HIDEO KOZONO of Waseda University for his outstanding contributions to harmonic analytic research for stationary and nonstationary problems to the incompressible Navier-Stokes equation. The Autumn Prize is awarded without age restriction to people who have made exceptional contributions in their fields of research. The Spring Prize and the Autumn Prize are the most prestigious prizes awarded by the MSJ to its members.

The 2014 Algebra Prizes have been awarded to YUJI YOSHINO of Okayama University for the study of Cohen–Macaulay representation theory and to HIDEKAZU FURUSHO of Nagoya University for studies of Grothendieck–Teichmüller theory and multiple zeta values.

The 2014 Analysis Prizes were awarded to KAZUHIRO ISHIGE of Tohoku University for research on the qualitative analysis of solutions of linear and nonlinear heat equations; to HIROFUMI OSADA of Kyushu University for research on stochastic dynamics and geometry for infinite particle systems; and to HIDETAKA HAMADA of Kyushu Sangyo University for studies on the Loewner differential equation in several complex variables and holomorphic mappings on homogeneous unit balls.

The 2014 Geometry Prize was awarded to MASATAKE KURANISHI for a series of outstanding original works far beyond geometry, ranging from the Cartan–Kuranishi theory and CR-geometry to the Kuranishi family.

The 2014 Takebe Katahiro Prizes have been awarded to TOSHIMICHI USUBA of Kobe University for research in set theory with emphasis on $P_{\kappa\lambda}$ combinatorics and its applications; to MASAKI TSUKAMOTO of Kyoto University for work on the mean dimension of infinite dimensional moduli spaces; and NEAL BEZ of Saitama University for the study of various inequalities appearing in harmonic analysis and partial differential equations. The prize is given to young researchers who have obtained outstanding results.

The 2014 Takebe Katahiro Prizes for Encouragement of Young Researchers have been awarded to the following: KEIJI TAGAMI of the Tokyo Institute of Technology for the study of positivities of links and Khovanov type link invariants; TATSUYUKI HIKITA of Kyoto University for a new approach to the combinatorics of diagonal coinvariants; SHUN OHKUBO of the University of Tokyo for the study of p-adic Galois representations of a local field with imperfect residue field; NORISUKE IOKU of Ehime University for harmonic analytical research for partial differential equations with logarithmic singularities; and MAKOTO NAKASHIMA of the University of Tsukuba for the study of branching random walks in random environment. The prize is intended for young mathematicians who are deemed to have begun promising careers in research by obtaining significant results.

The *Journal of the Mathematical Society of Japan* Outstanding Paper Prizes for 2014 have been awarded to DAISUKE FUJIWARA of Gakushuin University for "An integration by parts formula for Feynman path integrals", **65**, No. 4, 2013, pp. 1273–1318; and to HISASHI OKAMOTO of Kyoto University for "Blow-up problems in the strained vorticity dynamics and critical exponents", **65**, No. 4, 2013, pp. 1079–1099.

—From MSJ announcements

Prizes of the New Zealand Mathematical Society

The New Zealand Mathematical Society (NZMS) has announced several awards for 2014.

DAVID VERE-JONES of Victoria University of Wellington was awarded the 2014 Jones Medal in recognition of "his lifetime achievement in statistics, both for his revolutionary research on modeling earthquakes and his teaching of statistics and mathematics in New Zealand".

MARSTON CONDER of the University of Auckland was awarded the Hector Medal for his "outstanding contributions to mathematics both internationally and locally, particularly in the construction and analysis of discrete objects with maximum symmetry under given conditions". DIMITRI LEEMANS of the University of Auckland received the 2014 NZMS Research Award "for his striking contributions to algebraic combinatorics that combine techniques from algebra, graph theory, combinatorics and number theory for the exploration and classification of highly symmetric geometric structures".

DAVID SIMPSON of Massey University was honored with the 2014 NZMS Early Career Award "for his contributions to the analysis of the effects of randomness and uncertainties in nonsmooth dynamical systems".

TIMM TRESKATIS of the University of Canterbury was awarded the 2014 Aitken Prize for the best contributed

talk by a student at the NZMS Colloquium for his talk, "Accelerated gradient vs. primal-dual methods in nonsmooth optimisation".

ANDREA BABYLON of Massey University received the 2014 Australia and New Zealand Industrial and Applied Mathematics (ANZIAM) poster prize for the best poster by an early career researcher at the NZMS Colloquium for her poster, "Modelling leptospirosis in livestock". Four mathematicians were chosen as Fellows of the New Zealand Mathematical Society: ASTRID AN HUEF, University of Otago; GAVEN MARTIN, Massey University; GRAHAM WEIR, Industrial Research Ltd., and SIR VAUGHAN JONES, University of California Berkeley.

—From an NZMS announcement

AAAS Fellows Chosen

The following mathematical scientists have been elected fellows of the Section on Mathematics of the American Association for the Advancement of Science (AAAS): JAMES M. CROWLEY, Society for Industrial and Applied Mathematics (SIAM); CHARLES L. EPSTEIN, University of Pennsylvania; NATAŠA JONOSKA, University of South Florida; KIRK E. JORDAN, IBM Research Division; YURI TSCHINKEL, New York University; and HOWARD (HOWIE) WEISS, Georgia Institute of Technology.

—From an AAAS announcement

2014 Siemens Competition

©The Siemens Foundation

Peter Tian, third from left.

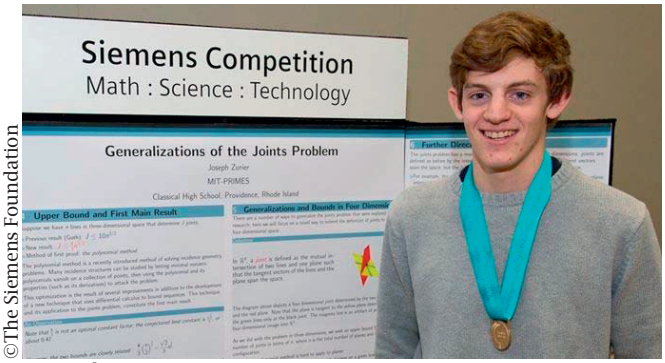
Several high school students whose work involves the mathematical sciences have won prizes in the 2014 Siemens Competition in Math, Science, and Technology.

PETER TIAN, a senior at the Wellington School in Columbus, Ohio, won the grand prize of a US$100,000 scholarship in the individual category for his project, "Extremal Functions of Forbidden Multidimensional Matrices", which makes significant advances in the theory of pattern avoidance for higher dimensional matrices and may assist in computing the shortest rectilinear path among obstacles in space.

This in turn has potential applications to motion planning in space or circuit design, including implications for other 3D areas dealing with space obstacles, such as drone programming for obstacle avoidance and self-driving cars. His work also extends a number of known results and advances areas of pure mathematics. Within mathematics, his project has a direct application to hypergraphs, and it also has potential applications to other areas of combinatorics and computational geometry. Tian was cofounder of his school's math club and is a Research Science Institute scholar and Mathematical Olympiad Summer Program attendee. He was mentored by Jesse Geneson of the Massachusetts Institute of Technology.

JOSEPH ZURIER, a senior at Classical High School, Providence, Rhode Island, was awarded the second-place prize of a US$50,000 scholarship for his project, "Generalizations of the Joints Problem".

His research contributed to work on an open problem in



©The Siemens Foundation

Joseph Zurier

geometry. His project concerns the intersection of line and planes in three and four dimensions. He was also the top prizewinner in the Who Wants to Be a Mathematician competition in 2013. He was mentored by Ben Yang of the Massachusetts Institute of Technology. The team of JONATHAN CHAN, a senior at Bergen County Academies, Hackensack, New Jersey, and MICHAEL SEAMAN, homeschooled, of Short Hills, New Jersey, was awarded the US$40,000 team scholarship for their project, "On the Distribution of Discriminants over a Finite Field". They proved a theorem about the distribution of discriminants of monic polynomials in finite fields. They were mentored by Keith Conrad of the University of Connecticut. The team of SHAKTHI SHRIMA, homeschooled, of Austin, Texas; ADAM FORSYTH, a senior at Georgetown Day School, Washington, DC; and JACOB GUREV, a junior at Mira Loma High School, Sacramento, California, was awarded the US$20,000 team scholarship for their project, "Metacommutation of the Hurwitz Integers and the Projective Line over Fp". They characterized unique factorization in the Hurwitz integers by using methods taken from projective geometry. Their results have possible applications in cryptography and in quantum field theory. The team was mentored by Henry Cohn of the Massachusetts Institute of Technology.

—From a Siemens Competition announcement