Integral

NEWS FROM THE MATHEMATICS DEPARTMENT AT MIT

Dear Friends,

Greetings from MIT Mathematics!

Faculty recruiting was tremendous last year and brought us four fantastic new individuals: Professors Alice Guionnet (probability), Larry Guth (geometry and harmonic analysis), Bill Minicozzi (geometric analysis and PDEs), and Assistant Professor Aaron Naber (Ricci solitons, collapsing theory). Jörn Dunkel (physical applied mathematics) will join us next year as Assistant Professor.

We filled two key staff positions with outstanding people: Barbara Peskin joined the department in January as Academic Administrator, with primary responsibility for running MAS, the Mathematics Academic Services office. This office, and hence Barbara herself, is our nexus for all things educational. With the growth in the mathematics major, now at over 350 students the third largest at MIT, and assorted new technologies and other changes, we are most fortunate to have Barbara, one of our former PhDs, here with us. Barbara's extensive mathematical experience as well as managerial experience from leadership positions at Dragon Systems and the International Computer Science Institute will serve us well. Cynthia Shen arrived two months ago as Administrative Officer. Cynthia runs Headquarters and is responsible for the oversight of all department finances and staff. She brings a great depth of knowledge from her prior MIT positions in finance at CSAIL and RLE.

Annual Retreat

The first Mathematics Department Retreat took place late September, organized by our graduate students. Over 150 department members, families, and guests traveled to Purity Spring Resort in the White Mountains in New Hampshire for a splendid weekend of hiking, canoeing, picking mushrooms, doing mathematics and relaxing. Late nights laughing around the bonfire and playing board games in the lodge made for a memorable time. We expect the Retreat to become an annual tradition.

Building 2 Renovation

Preparations for the Building 2 renovation gathered speed over the summer. We've worked closely with Ann Beha Architects and MIT planners to arrive at an exciting scheme that adds common spaces and offices, mezzanines and skylights, and takes good advantage of our outlooks over the Charles River. The schedule calls for construction to begin this summer. We'll pack up our things and move to temporary quarters in Building E17/18, which is being refurbished too. Mathematics faculty and staff recently saw the E17/18 space during a lunch we served there. It met with general approval—proximity to the Kendall Square restaurants and the T station being seen as a plus, as noted by several people. We will be sharing E17/18 with Economics, whose regular building will be renovated at the same time. When we return to Building 2 after the work is done, Building E17/18 will serve as swing space for other departments as their turn comes for major renovation.

We are deeply grateful to Jim and Marilyn Simons, and the Simons Foundation, for the leadership gift that is helping make this project possible. We are in the process of raising additional funds to cover as much of the remaining renovation cost as we can. The MIT Administration and the Facilities Department have worked with us intensively to produce a design that meets our needs.

Simons Lectures

This year's Simons Lectures will take place in May, given by Emmanuel Candès and Raphaël Rouquier.

MITx and edX

In other activities, the Department has been considering ways to participate in edX, the initiative for online education. The edX enterprise is building technology to enhance the learning experience for MIT students and to reach thousands or millions of students worldwide. The potential is extraordinary, but the uncertainties are many. We are excited about the possibilities and we will work on overcoming the challenges.

Visiting Committee

I'll close by thanking the members of our Visiting Committee, which convened this past spring under the leadership of its new chair, Art Samberg. I also thank my colleagues for their excellent presentations and participation. The meeting was successful, with broad enthusiasm expressed for the results of our recent faculty recruiting efforts and lots of discussion about how the Department could and should participate in edX. The renovation was a major agenda item. Lead architect Ann Beha came and inspired us with her vision for new spaces at MIT. She knows the campus well from her days as an architecture graduate student here. We appreciate the time invested by everyone, as well as their helpful ideas and their support.

Have a good year!

Michael Sipser
Department Head

New Faculty

Alice Guionnet, Professor of Mathematics, comes to MIT from École Normale Supérieure Lyon, where she was on the faculty since 2000. Guionnet is a probabilist, specializing in random matrices, large deviations, free probability, and the statistical mechanics of disordered systems. As Director of Research at ENS Lyon, she built a top-ranking probability group. Her distinctions include the Miller Institute Fellowship, the Loève Prize, the Silver Medal of CNRS, and Simons Investigator. She received her PhD from ENS Paris under the guidance of Gérard Ben Arous.

Larry Guth, Professor of Mathematics, arrives from NYU's Courant Institute of Mathematical Sciences. Guth works in systolic and harmonic analysis. He's made major breakthroughs on several long-standing questions including the endpoint multilinear Kakeya conjecture and the Erdös distinct distances problem in combinatorial geometry. Guth received his PhD at MIT in 2005 under Tom Mrowka. Following appointments at Stanford and the University of Toronto, he joined the Courant Institute as Professor of Mathematics in 2011.

Aaron Naber, Assistant Professor of Mathematics, has been a CLE Moore Instructor here since 2009. Naber is a geometric analyst working on the large-scale structure of Riemannian geometry, Ricci flow, singularity theory of harmonic maps, and Kähler geometry. Naber completed his PhD at Princeton University in 2009 under Gang Tian.

William Minicozzi, Professor of Mathematics, arrives from Johns Hopkins University, where he has been on the faculty since 1994. Minicozzi's field is geometric analysis. His groundbreaking work with Toby Colding settled several major problems in the theory of embedded minimal surfaces of 3 manifolds. For these contributions, they shared the 2010 Veblen Prize in Geometry. Minicozzi received his PhD from Stanford University in 1994 under Richard Schoen.

Faculty Achievements

Igor Rodnianski was awarded the 2011 Fermat Prize by the Toulouse Mathematics Institute, "for his fundamental contributions to the study of the equations of general relativity and of the propagation of light on curved space-times." **Bonnie Berger** was elected fellow of the American Academy of Arts and Sciences and fellow of the International Society for Computational Biology. **Bjorn Poonen** was elected fellow of the American Academy of Arts and Sciences. **Alice Guionnet** and **Paul Seidel** were chosen to be Simons Investigators by the Simons Foundation. **Victor Kac** was selected to be a Simons Fellow by the Simons Foundation. **Mark Behrens** received the 2011 School of Science Prize for Excellence in Graduate Teaching. **Pavel Etingof** was selected to be the next Robert E. Collins Distinguished Scholar. **Jacob Fox** was selected to be the next recipient of the Edmund F. Kelly Research Award. **Michael Sipser** was selected to be the next holder of the Barton L. Weller Professorship. **Alexei Borodin** gave the 2012 London Mathematical Society Lectures at the University of Glasgow, a series of ten lectures on determinantal point processes and representation theory. **Paul Seidel** gave the 2012 Mordell Lecture at Cambridge University and the 2011-2012 Distinguished Lecture Series at UCLA. **David Vogan** was elected President of the American Mathematical Society, starting February 2013.

Ju-Lee Kim was promoted to Professor.

Abhinav Kumar and **Jonathan Kelner** were promoted to Associate Professor.

Research Staff Awards

Alejandro Rodriguez and **Andrew Sutherland** each received the School of Science Infinite Mile Award. Andrew was also awarded the Selfridge Prize for the top paper at the Algorithmic Number Theory Symposium. He was recently promoted to Principal Research Scientist.

Staff Award

Erin McGrath, Director of Development for the Mathematics and Physics departments, received the 2012 MIT Excellence Award in the category of Serving the Client.

Student Awards

Graduate students **Sheel Ganatra**, **Hoeskuldur Halldorsson**, and **Alejandro Morales** received the Charles and Holly Housman Award for excellence in undergraduate teaching. **Steven Sam** received the Charles W. and Jennifer C. Johnson Prize for an outstanding paper accepted for publication.

Undergraduate **Fan Wei** '12 received the Jon A. Bucsela Prize in Mathematics for distinguished scholastic achievement, professional promise, and enthusiasm for mathematics. She also received the Alice T. Schafer Prize for excellence in mathematics by an undergraduate woman in mathematics, given by the Association for Women in Mathematics. Undergraduate **Amol Aggarwal** '15 and his mentor, graduate student **Guozhen Wang**, shared the Hartley Rogers Jr. Prize for the best SPUR paper. **Jacob Steinhardt** '12 received a Hertz fellowship to support his graduate studies. **George Arzeno** '14, **Jon Schneider** '13, **Shawn Tsosie** '12, and **Fan Wei** '12 were Poster Session Winners at the Joint Meetings of the AMS and MAA.

Another Putnam Record

We had a record-breaking year at the 2011 William Lowell Putnam Mathematical Competition. An astonishing 36% of all high scorers in this North American competition were MIT students. Precisely speaking, of the 81 high scorers (Honorable Mention and higher), MIT had 29, more than the next five schools combined (Princeton 9, Stanford 6, Carnegie-Mellon 5, Harvard 4, and Caltech 3).

Congratulations to the fabulous 29: Noah Arbesfeld, Paul Christiano, Cesar Cuenca, Akashnil Dutta, Vlad Firoiu, Whan Ghang, Benjamin Gunby, Brian Hamrick, Travis Hance, Yangzhou Hu, Jiaoyang Huang, Hyun Hwang, Tian-Yi Jiang, Supanat Kamtue, Vladislav Kontsevoi, Reed LaFleche, Holden Lee, Zipei Nie, Timothy Reynolds, David Rolnick, Colin Sandon, Jonathan Schneider, Jeffrey Shen, Xiaolin Shi, Warut Suksompong, Bogdan Veklych, Mark Velednitsky, Tianqi Wu, Kerry Xing.

MLK Visiting Assistant Professor Terrence Blackman

Terrence Blackman is spending this year with us as Dr. Martin Luther King, Jr., Visiting Assistant Professor. Terrence is on the mathematics faculty of Medgar Evers College, CUNY, in Brooklyn, NY. He works in the Jacquet-Langlands correspondence in the Langlands program, and more broadly in representation theory, number theory, and automorphic forms. He's also interested in promoting diversity in mathematics and science, specifically in the teaching of mathematics in largely African-American settings.

Lead Gift from the Simons Foundation Catalyzes Building 2 Renovation

The Simons Foundation, founded by Jim and Marilyn Simons, has made the lead gift for the renovation of Building 2, creating a new home for our faculty, students, staff, and visitors.

Jim is well known as a great mathematician and legendary hedge fund manager, but he wasn't always so successful. When he was 14, Jim got a job at a garden supply store. He was first sent to the stock room, and reports "I was terrible at it." He couldn't remember what went where. The couple who owned the store demoted him to floor sweeper. That suited him more. "I loved it," Jim remembers. "I got to walk and think—and I got paid." When the job was over, the owners asked Jim about his future plans. He told them he intended to study mathematics at MIT. "My bosses thought this was hilarious, the kid who couldn't remember where to put the sheep manure wanting to study math."

Jim completed his undergraduate degree in math at MIT in three years.

He went on to Berkeley for a PhD and taught at both MIT and Harvard. He then got a job with the Institute for Defense Analysis, from which he was not just demoted but fired, this time for criticizing the war in Vietnam.

Jim went on to become head of the Department of Mathematics at Stony Brook. He was only 30 years old.

Jim's area of research is in geometry and topology. He received the American Mathematical Society's 1976 Veblen Prize in Geometry for work that involved a recasting of the subject of area-minimizing multidimensional surfaces. A consequence was the settling of two classical questions, the Bernstein conjecture and the Plateau problem. His most influential research

The Walls of Building 2
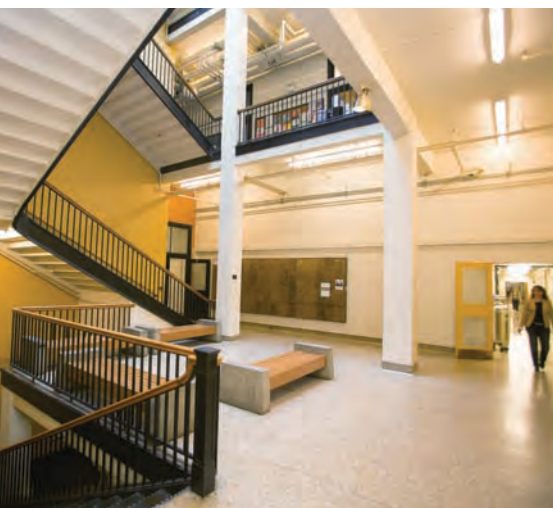
Building 2 has long been our home, since 1916 when Mathematics was called "General Studies." If only these corridors could speak, what stories they could tell. Farewell Building 2. We'll be back!

involved the discovery and application of certain geometric measurements, now called the Chern-Simons invariants.

Then Jim decided to make a change. He started an investment business that deployed sophisticated proprietary models. These generated astonishing returns. The New York–based company, Renaissance Technologies, employs mathematics and physics PhDs to analyze the behavior of markets. Its Medallion Fund is one of the most successful hedge funds of all time. Jim is now retired from the day-to-day management of Renaissance and is concentrating on mathematics and philanthropy. A few years ago, Jim gave a guest lecture at MIT on gauge theory and topology. More recently, he gave the Dean of Science Colloquium entitled, "Mathematics, Common Sense, and Good Luck: My Life and Careers." It filled every seat in lecture hall 10-250. The video of that lecture is at http://math.mit.edu/simons-video.

In addition to their magnificent support of our new home, Jim and Marilyn have endowed three professorships in mathematics: the Simons Chair, held by Richard Melrose; the Norman Levinson Chair, held by Toby Colding; and the Isadore Singer Chair, held by Tom Mrowka.

As Mathematics Department Head Michael Sipser says, "Jim and Marilyn have been instrumental in changing the landscape of mathematics by their extraordinary support at MIT and throughout the country, and by changing the perception of mathematics from ivory tower to an instrument of extraordinary power. We are all deeply grateful to them."

For information on making a gift to the Mathematics Department, please contact Director of Development for Mathematics, Erin McGrath, at emcgrath@mit.edu or 617-452-2807.

From Associate Head Haynes Miller

Barbara Peskin heads the new Mathematics Academic Services office
Leadership of the newly merged undergraduate and graduate mathematics offices passed in February 2012 to Dr. Barbara Peskin. Barbara holds a 1980 PhD from this department, under the direction of Mike Artin. Her academic career included six years at Mt. Holyoke and several years at Harvard. She joined Dragon Systems, moved on to the International Computer Science Institute, then directed work on clinical trial simulations with Kaiser Permanente. We are lucky to have her back in the MIT fold as Mathematics Academic Administrator.
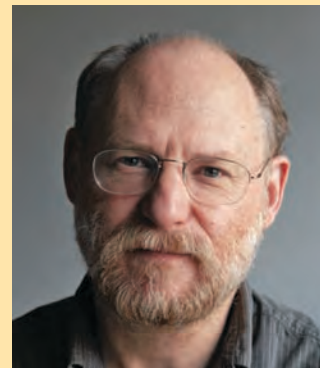
What's new at OCW?
The launch of MIT OpenCourseWare a decade ago changed the landscape of online education. The Mathematics Department listings are among OCW's most popular courses. Gilbert Strang's Linear Algebra class, for example, will record its two millionth hit this fall!

OCW publications are essentially archives. Over the summers of 2010 and 2011, OCW launched OCW Scholar, which offers complete chronologically sequenced online courses for several science subjects by augmenting the basic OCW material with recitation videos and text. The OCW Scholar projects in mathematics were led by Associate Professor Benjamin Brubaker (18.01), Lecturer Jeremy Orloff (18.02 and 18.03), and Gilbert Strang (18.06), and involved video recorded "recitations" led by a dozen graduate students and postdocs.

The Mathematics Department is working with MITx to create online versions of these basic courses.

MITx, edX, and Math
In December, 2011, MIT announced an initiative in online education under the name MITx. Five months later this was expanded to a broader initiative known as edX, including Harvard University as an equal partner. Since then, UC Berkeley and the University of Texas system joined the consortium. This initiative offers an exciting prospect of enhancing our residential education leading to an MIT degree, while providing state-of-the-art distance education to the world.

Unlike OpenCourseWare, edX courses will be interactive. Students will submit homework and do exams. We recognize that producing first-rate edX courseware will take time. EdX has hired former Moore Instructor Grace Lyo to serve as mathematics liaison and content development manager. Our current objective is to launch MITx versions of one or two courses in fall 2013.

Probability and Statistics
The Mathematics Department has won a two-year grant from the Davis Educational Foundation to build a new curriculum and pedagogy for 18.05 Probability and Statistics. This subject will introduce a new degree of active classroom engagement in MIT mathematics. We will be focusing on techniques and examples from the life sciences. The Principal Investigator for this project is Haynes Miller; the lead content developer is Jeremy Orloff, with assistance from Moore Instructor Jonathan Bloom and consultancy by Professor Sanjoy Mahajan of Olin College of Engineering and formerly of MIT's Teaching and Learning Laboratory.

Department Retreat

Huge thanks to our graduate students for organizing our department retreat. Chief organizer **Rosalie Belanger-Rioux** coordinated the planning and participated at every level. Others involved include: **Michael Donovan** – sign-up, buses, **Dana Mendelson** – rooming list, food and drinks, **John Binder** – venue finding, buses, **Yasha Berchenko-Kogan** – venue, food and drinks, **Anand Oza** – food and drinks, **Xuwen Zhu** – survey, campfire, **Efrat Engel-Shaposhnik** – rooming list, **Hannah Alpert** – minutes, hikes, **Ailsa Keating** – venue finding. Activity planners: **Jonathan Bloom**, **Ben Elias**, **Pavel Etingof**, **Katrin Wehrheim**, **Roberto Svaldi**, **Yasha Berchenko-Kogan**, and others.

2012

2012 Doctorates

Degrees awarded September 2011 through September 2012

Martina Balagovic, *"On Representations of Quantum Groups and Cherednik Algebras,"* under Pavel Etingof. Martina is now a postdoc at York University.

Nadia Benbernou, *"Geometric Algorithms for Reconfigurable Structures,"* under Erik Demaine. Nadia is now at Google.

Tsao-Hsien Chen, *"Geometric Langlands in Prime Characteristic,"* under Roman Bezrukavnikov. Tsao-Hsien is a postdoc at Princeton University and at IAS.

Sheel Ganatra, *"Symplectic Cohomology and Duality for the Wrapped Fukaya Category,"* under Denis Auroux. Sheel is a now a postdoc at Stanford.

Hila Hashemi, *"Geometric Manipulation of Light: From Nonlinear Optics to Invisibility Cloaks,"* under Steven Johnson.

YoonSuk Hyun, *"On Affine Embeddings of Reductive Groups,"* under James McKernan. YoonSuk is now a postdoc at KAIST.

Nikola Kamburov, *"A Free Boundary Problem Inspired by a Conjecture of De Giorgi,"* under David Jerison. Nikola is now a postdoc at the University of Arizona.

Joel Lewis, *"Pattern Avoidance for Alternating Permutations and Reading Words of Tableaux,"* under Alexander Postnikov. Joel is now a postdoc at the University of Minnesota.

Niels Moeller, *"Mean Curvature Flow Self-Shrinkers with Genus and Asymptotically Conical Ends,"* under Toby Colding. Niels is now a postdoc at Princeton.

Alejandro Morales, *"Combinatorics of Colored Factorizations, Flow Polytopes and of Matrices over Finite Fields,"* under Alexander Postnikov. Alejandro is now a postdoc at the University of Quebec.

Ramis Movassagh, *"Eigenvalues and Low Energy Eigenvectors of Quantum Many-Body Systems,"* under Peter Shor. Ramis is now an instructor at Northeastern.

Su Ho Oh, *"Combinatorics Related to the Totally Non-negative Grassmannian,"* under Alexander Postnikov. Su Ho is now a postdoc at the University of Michigan.

Anatoly Preygel, *"Thom-Sebastiani and Duality for Matrix Factorizations, and Results on the Higher Structures of the Hochschild Invariants,"* under Jacob Lurie. Anatoly is now a postdoc at UC Berkeley.

Steven Sam, *"Free Resolutions in Combinatorics and Geometry,"* under Richard Stanley. Steven is now a postdoc at the Miller Institute, UC Berkeley.

Nikhil Savale, *"Spectral Asymptotics for Coupled Dirac Operators,"* under Tom Mrowka. Nikhil is now a postdoc at the University of Paris-Sud.

Nicholas Sheridan, *"Homological Mirror Symmetry for a Calabi-Yau Hypersurface in Projective Space,"* under Paul Seidel. Nicholas is now a postdoc at Princeton.

David Shirokoff, *"I. A Pressure Poisson Method for the Incompressible Navier-Stokes Equations: II. Long Time Behavior of the Klein-Gordon Equations,"* under Ruben Rosales. David is now a postdoc at McGill University.

Peter Speh, *"A Classification of Real and Complex Nilpotent Orbits of Reductive Groups in Terms of Complex Even Nilpotent Orbits,"* under David Vogan. Peter is now at Jane Street Capital.

Olga Stroilova, *"The Generalized Tate Construction,"* under Haynes Miller. Olga is now at Vecna Technologies.

Fucheng Tan, *"Families of p-adic Galois Representations,"* under Barry Mazur. Fucheng is now a postdoc at McMaster University.

Roman Travkin, *"Quantum Geometric Langlands Correspondence in Positive Characteristic: the GL(N) Case,"* under Roman Bezrukavnikov. Roman is now a research scholar at the Clay Mathematics Institute.

Jethro van Ekeren, *"Modular Invariance for Vertex Operator Superalgebras,"* under Victor Kac. Jethro is now a postdoc at IMPA, Brazil.

Kartik Venkatram, *"Birational Geometry of the Space of Rational Curves in Homogeneous Varieties,"* under James McKernan. Kartik is now a CCR at the US Government.

Inna Zakharevich, *"Scissors Congruence as K-theory,"* under Michael Hopkins. Inna is now a postdoc at the University of Chicago.

Alumni Corner
Memories of Dirk J. Struik and Norbert Wiener

I was an undergraduate at MIT during the mid-fifties, where my bachelor's thesis advisor was the geometer and historian of mathematics, Dirk J. Struik. Struik was then sixty-two, recently reinstated after his refusal to cooperate with the House Un-American Activities Committee. I studied elementary differential geometry with him for a semester, wrote my bachelor's thesis under his tutelage, but never sniffed a whiff of his Marxist ideology. His love of knowledge and appreciation of its unity and beauty, on the other hand, was a fragrance I could sense. His teaching combined mathematical precision with an appreciation for intuitive foundations. I once asked him to explain the concept of an osculating plane, which came up in his discussion of curves in space. "I like to hike on Mt. Washington," Struik replied. "The trail I take has large flat rocks. Since I am an old man, I choose to walk along a path—a curve—for which the rocks are osculating planes, because it is easiest."

I took elementary calculus from Norbert Wiener. One day he asked for questions about the homework. A student raised his hand and said that he knew the answer to a particular problem because it was in the back of the book, but "would Professor Wiener please work the problem" because the student could not see how to do it. Wiener nodded, paced back and forth at the front of the classroom for a moment, turned to the board, and wrote the answer. "I know the answer," the student reminded him. "But how do you work the problem?" Wiener nodded apologetically, briefly paced back and forth again, then turned to the board and wrote the answer a second time. The student became upset, whereupon Wiener, out of patience, exploded. "What do you want? I've worked the problem two different ways for you!"

Both Struik and Wiener appreciated the deep role mathematics has played in the evolution of civilization. One day I was in Struik's office when Wiener tapped on the door and Struik invited him in. They sat on the only two chairs in the small office, and I sat on the floor in a corner. The two great men launched into a wide-ranging discussion about scientific developments in twelfth-century Europe, ignoring me completely. Finally Wiener ended a monologue with the expression "Cœur de Lion." He then turned to me, bent down and said, "Richard the Lionhearted."
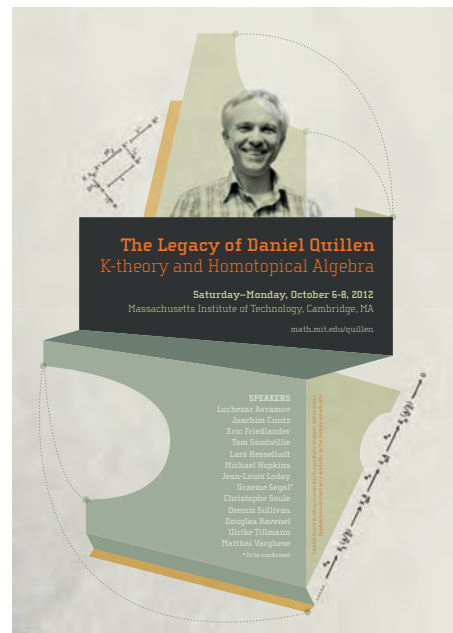
—*H. L. Resnikoff*

RSI, SPUR, PRIMES, and PRIMES Circle

PRIMES (Program for Research in Mathematics, Engineering and Science) is starting its third year with tremendous momentum and success. This program gives local area high school students an opportunity to work with MIT researchers on exciting unsolved problems in mathematics, computer science, and computational biology. RSI, SPUR, and PRIMES students have been recognized with numerous honors for their accomplishments. PRIMES students David Ding and Xiaoyu He and RSI student Sitan Chen won Davidson Fellowships. All eight 2012 Siemens regional finalists in Massachusetts and New Hampshire were PRIMES students. Thanks to Chief Research Advisor Pavel Etingof, Program Director Slava Gerovitch, and Head Mentor Tanya Khovanova for these wonderful results.

In the fall of 2012, PRIMES opened a new section, PRIMES Circle, for talented sophomores and juniors from public high schools of Boston, Cambridge, and Somerville. The Circle students will work under the guidance of MIT undergraduate student mentors to study mathematics beyond the high school curriculum. The students will practice problem solving, expository writing, and presentation skills. The goal of this program is to increase diversity in the mathematics community by helping strong students with disadvantaged backgrounds develop their interest in mathematics and set them on a path toward pursuing a math major in college.

Dr. Chelsea Walton, an NSF postdoctoral researcher and Mathematics Department Moore Instructor, is the PRIMES Circle Program Coordinator.

The Legacy of Daniel Quillen
K-theory and Homotopical Algebra
Saturday–Monday, October 6–8, 2012
Massachusetts Institute of Technology, Cambridge, MA
math.mit.edu/quillen

SPEAKERS
Luchezar Avramov
Joachim Cuntz
Eric Friedlander
Tom Goodwillie
Lars Hesselholt
Michael Hopkins
Jean-Louis Loday
Graeme Segal*
Christophe Soule
Dennis Sullivan
Douglas Ravenel
Ulrike Tillmann
Matthai Varghese
*To be confirmed

In Memory of Daniel Quillen

The world lost a great mathematician on April 30, 2011, with the passing of Daniel Quillen. Quillen began at MIT as a Moore Instructor in 1964 and served as Professor of Mathematics from 1971 to 1984, when he left for Oxford University. In 1978 he won the Fields Medal for his work on the cohomology of groups and the creation of higher algebraic K-theory. While at MIT, he was known for his beautifully crafted courses. He enjoyed teaching 18.075 Mathematical Methods for Scientists and Engineers, using Francis Hildebrand's book.

MIT hosted a conference in memory of Dan Quillen over the Columbus Day weekend: http://math.mit.edu/quillen/. Thirteen speakers and about 150 participants discussed current research in some of the areas deeply influenced by Quillen's work.

Upcoming

Gelfand Centennial Conference
A View of 21st Century Mathematics, MIT August 28–September 2, 2013.