ContinuUM

University of Michigan
Department of Mathematics
NEWSLETTER • 2010

View from the Chair's Office - Mel Hochster

The Department has had a very successful year, despite having to overcome difficult financial circumstances. We have two new faculty members: Assistant Professor Lydia Bieri (PDE and relativity) and Professor John Schotland (theoretical optical physics and biomedical imaging). In addition, Associate Professor David Speyer (tropical geometry) and Professor Mark Rudelson (analysis), who were hired in 2009 joined us this fall. New faculty are profiled on page 4.

Erhan Bayraktar was promoted to Associate Professor, and is the first Susan M. Smith Professor in Actuarial Mathematics. Anna Gilbert was promoted to the rank of Professor. Our faculty have been getting national recognition in many ways, as detailed on page 3. We have had the good fortune of maintaining an excellent cohort of regular faculty, and strong postdoctoral faculty who add vibrancy to our program. All of them contribute to attracting new faculty and students to UM.

During the 2009-10 academic year, the Department hosted several special lectures by renowned mathematicians. Cedric Villani, a 2010 Fields Medalist, presented a set of Ziwet lectures in the fall. Our alumnus and former faculty member Chris Skinner presented another set of Ziwet lectures in the winter. Rodrigo Bañuelos presented the Marjorie Lee Browne colloquium on Martin Luther King Day. Fields Medalist Terry Tao from UCLA presented the Rainich lectures in March, and also gave the prestigious Ford Lecture in Physics. Terry is one of the most recognized mathematicians in the world, and we were fortunate to be able to host him at UM.

The Department's Actuarial Program was evaluated this year, and the University of Michigan is now one of a handful of universities that have won the designation Center of Actuarial Excellence (see page 11).

After many years of terrific service, Peter Duren and Ricky Wasserman retiried this year. We hope and expect to see them frequently around the Department, and their presence among the faculty will be greatly missed.

The University of Michigan is weathering the current financial crisis better than many other institutions. I feel very strongly that a large part of the credit for this should go to our colleague Phil Hanlon, who served as Vice Provost for Aca-

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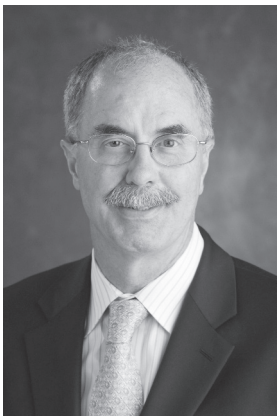
Hanlon Named Provost

The Department is pleased to announce that one of our own, Philip Hanlon, has been selected as Provost and Executive Vice President for Academic Affairs by President Mary Sue Coleman. Hanlon, the Donald J. Lewis Professor of Mathematics, assumed the appointment July 1.



The provost is the chief academic and budgetary officer and is responsible for sustaining and enhancing the university's academic excellence in teaching, research and creative endeavors. The provost oversees the activities of UM's 19 schools and colleges as well as numerous interdisciplinary institutes and centers.

Hanlon has served as the vice provost for academic and budgetary affairs since 2004. In this role, he worked closely with the provost on all matters pertaining to the university's general fund budget and on development and support of academic programs and initiatives. During his appointment, he led a presidential initiative to advance interdisciplinary teaching at the undergraduate level and organized a campuswide initiative aimed at making more effective use of space and facilities.

Hanlon came to the university in 1986 as an associate professor of mathematics and rose to the rank of professor in 1990.

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Inside

Hanlon

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From 2001-04 he served as the Associate Dean for Planning and Finance in the College of Literature, Science and the Arts, where he played a lead role in budgeting and academic planning within the college. During that time, he was responsible for implementing a new incentive-based budget model within the college.

His dedication to undergraduate teaching has been recognized by an Excellence in Education Award and a Thurnau Professorship. Hanlon also was the founder and first executive director of the Michigan Math and Science Scholars, a thriving summer program for high school students who have a strong interest in math and science.

His research interests lie in the areas of algebraic combinatorics, discrete probability, bioinformatics and theoretical computer science. He has published in a number of professional mathematics journals throughout his career. Hanlon has received numerous awards for his mathematical research including a Sloan Fellowship, a Guggenheim Fellowship, a Presidential Young Investigator Award and the Henry J. Russel Award in 1990.

Hanlon has a bachelor's degree from Dartmouth College and a Ph.D. from the California Institute of Technology.

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Bayraktar Named First Smith Professor

Associate Professor Erhan Bayraktar has been named the first Susan M. Smith Professor in Actuarial Mathematics. The professorship was established in 2007 by alumna Susan M. Smith.

Bayraktar received his Ph.D. in 2004 from Princeton, majoring in electrical engineering, with a minor in operations research and financial engineering. He was an undergraduate student at Middle East Technical University in Ankara, Turkey, where he received two B.S. degrees in 2000: one in electrical engineering and the other in mathematics. He came to UM as a Hildebrandt Research Assistant Professor in 2004, and was moved to a tenure-track assistant professorship in 2006. He became a tenured Associate Professor in 2010.

Bayraktar's primary research interests are in mathematical finance, stochastic analysis, applied probability and stochastic control. His research is funded by the National Science Foundation, and most recently he received an NSF CAREER grant in Applied Mathematics in 2010. His research was also funded by the Society of Actuaries and the Actuarial Foundation. Bayraktar has published articles in several mainstream journals, including SIAM Journal on Control and Optimization, SIAM Journal on Mathematical Analysis, Stochastic Processes and Their Applications, Mathematical Finance, Finance and Stochastics, Mathematics of Operations Research, Annals of Applied Probability, Insurance: Mathematics and Economics, North American Actuarial Journal, Proceedings of the American Mathematical Society, and Illinois Journal of Mathematics. Recently, Bayraktar was selected to be the first recipient of the SIAG/FME (SIAM Activity Group on Financial Mathematics and Engineering) Junior Scientist Prize.

Financial mathematics is in high demand among students, and few of our faculty are qualified to teach it. Bayraktar's classroom teaching has been concentrated in this area, and he also teaches courses for the financial engineering program. Bayraktar currently advises three Ph.D. students, and has already overseen two successful doctorates in 2008 and 2009.

Susan Smith graduated in 1963 with a B.S. degree in mathematics. Having taken nearly all of the actuarial courses required for a Master's degree, she interviewed for actuarial positions, and joined Towers Perrin in Philadelphia shortly after graduation. She worked her way up through the company and was named a Vice President in 1984. Smith joined the Detroit Office of Towers Perrin in 1987, and retired in 1992 after nearly thirty years of service.

A long-time supporter of UM and actuarial mathematics, Smith has been an active member of the Department's Actuarial Alumni/ae Leadership Council. "The University of Michigan has been good to me and my family," Smith said, "and it was time to give something back." Since retirement, Smith met and married Robert H. Gray, who is a Professor Emeritus of the U-M School of Public Health.

See more news on our web site

www.math.lsa.umich.edu

Faculty Recognition

Irina Arakelian, Lecturer IV and Director of the Michigan Mathematics Laboratory, has received an Excellence in Education Award from the College of Literature, Science and the Arts. This award recognizes special contributions to the College's educational mission in the areas of classroom teaching, curricular innovation, and the supervision of student research, as well as other significant contributions to the quality of the College's teaching-learning environment.

Associate Professor **Erhan Bayraktar** received a 2010 CAREER Award from the National Science Foundation for his project "Topics in Optimal Stopping and Control." The CAREER awards provide early career development for faculty with outstanding potential. Most recently, Bayraktar was selected to to be the first recipient of the SIAG/FME (SIAM Activity Group on Financial Mathematics and Engineering) Junior Scientist Prize. The Junior Scientist Prize is awarded to an outstanding junior researcher in the field of financial mathematics for distinguished contributions to the field in the three calendar years prior to the year of the award. The selection committee recognized Bayraktar's varied, deep and original contributions to financial mathematics, covering important problems in derivative pricing, credit risk, portfolio choice and insurance. Bayraktar also was promoted to Associate Professor this year.

William Fulton, the Oscar Zariski Distinguished University Professor of Mathematics, received the 2010 American Mathematical Society Leroy P. Steele Prize for Lifetime Achievement, one of the highest distinctions in mathematics. The award states that "Fulton has played a pivotal role in shaping the direction of algebraic geometry and in forging and strengthening ties between algebraic geometry and adjacent fields."

Anna Gilbert was promoted to Professor this year. In 2008, she was awarded the National Academy of Sciences Award for Initiatives in Research for her work on innovative algorithms using wavelets and sampling techniques and their impact on data analysis and sparse approximation. She also received the 2008 ACM Douglas Engelbart Award for her paper on graph compression (joint with Lada Adamic, Xiaolin Shi, and Matthew Bonner).

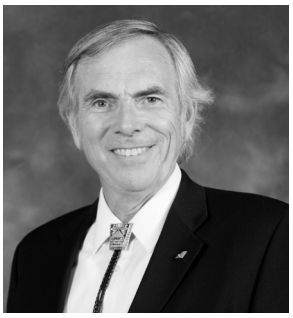
Professor **Robert L. Griess, Jr**. (left) received the 2010 American Mathematical Society Leroy P. Steele Prize for a Seminal Contribution to Research, one of the highest distinctions in mathematics. Griess was recognized for his construction of the "Monster" sporadic finite simple group. The construction was accomplished by Griess, not only for the first time but also entirely by hand without the aid of a computer.

At their annual meeting in Boston, the Society of Actuaries recognized Actuarial and Financial Mathematics Program Director, **Curtis Huntington**, for his tremendous contributions to the profession by presenting him with a Presidential Award.

Professor **Trachette Jackson** has received the 2010 Blackwell-Tapia prize in Mathematics for her mathematical contributions and for her efforts to address the problem of the under-representation of minorities in mathematics.

Karen Rhea, Lecturer IV and Director of the Introductory Calculus program, has received the Matthews Underclass Teaching Award from the College of Literature, Science and the Arts. The award recognizes a faculty member who has made a distinctive contribution to teaching in courses at the first- or second-year level in the fields of Mathematics, History, and Modern Languages, and who demonstrates enthusiasm and dedication to undergraduate education.

Professor **Robert Megginson** (below) has been elected a fellow of the American Association for the Advancement of Science. Members are chosen because of their scientifically or socially distinguished efforts to advance science or its applications. In addition, the Mathematical Sciences Research Institute has named Megginson a lifetime member of their Human Resources Advisory Committee. The appointment recognizes meritorious service to the profession in recruiting and retaining minorities in mathematics. He is only the second person to receive such an honor.



Assistant Professor **Juan Souto** received a 2010 NSF CAREER award for his project "Kleinian, Arithmetic and Mapping Class Groups." The CAREER awards provide early career development for faculty with outstanding potential.

View from the Chair's Office

(*continued from page 1*)

demic and Budgetary Affairs. I know that many others feel the same way, and I am pleased to report that Phil is the new Provost of the University of Michigan, replacing Theresa Sullivan, who is now President of the University of Virginia (see related article). His new responsibilities as Provost haven't kept Phil from teaching a section of Math 115 this fall!

New Faculty

Lydia Bieri

Lydia Bieri joined the Department in 2010 as an Assistant Professor. She received her Ph.D. in 2007 from ETH Zürich. Prior to joining UM she was a Benjamin Peirce Lecturer with the status of an assistant professor at Harvard. Bieri's research is in nonlinear partial differential equations, geometric analysis, differential geometry and general relativity theory. More specifically, Bieri's research focuses on the Einstein equations in general relativity. These equations govern the geometry of spacetime and thereby the phenomenon of gravitation. Bieri investigates existence and uniqueness of global solutions to the Einstein equations and studies the geometry of the solution spacetimes. A major goal in general relativity is to describe spacetimes which do not collapse and form black holes. Bieri's thesis and other publications have examined the geometry of 4-dimensional spacetimes which are global solutions of the Einstein vacuum equations, establishing important results. Moreover, Bieri's results enable her to study gravitational radiation and relate her findings to experiments.

Mark Rudelson

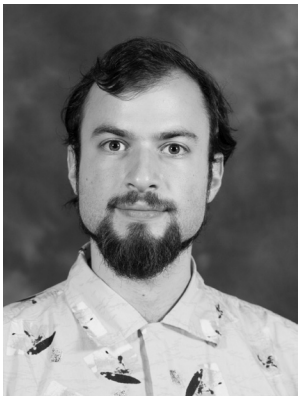
Mark Rudeleson joined the Department in 2010 as a Professor. He received his Ph.D. in 1997 from the Hebrew University of Jerusalem. After graduating, he held postdoctoral appointments at MSRI Berkeley, Texas A&M and the University of Missouri. He joined the Missouri faculty in 2000 as an Assistant Professor, and was promoted through the ranks, most recently being named the Luther Marion Defoe Distinguished Professor of Mathematics. Rudelson is one of the most recognized researchers in geometric functional analysis. His work has developed solutions to major open problems and opened new directions in a broad range of areas including asymptotic geometric analysis, convex geometry, high-dimensional probability theory, functional analysis and its applications. Rudelson's research in recent years has been concentrated in the area of random matrices, where, jointly with Roman Vershynin, he proved two long-standing conjectures. They were invited to give a talk on these results at the 2010 International Congress of Mathematicians in India.

John Schotland

John Schotland joined the Department in 2010 as a Professor. He holds joint appointments in Physics, Electrical and Computer Engineering, and Biomedical Engineering. He received his M.D. and Ph.D. from the University of Pennsylvania in 1996. He was an Associate Professor at Washington University from 1998-2002, then joined the University of Pennsylvania in 2002, and was named a Professor in 2008. Schotland's research interests are in applied mathematics and theoretical physics. His areas of expertise include scattering theory, wave propagation in random media and quantum optics. Inverse problems and their applications to imaging are a unifying theme that connects these areas. Schotland received the S. Reid Warren award for excellence in undergraduate teaching at Penn.

David Speyer

David Speyer joined the Department in 2010 as an Associate Professor. He received his Ph.D. in 2005 from the University of California, Berkeley. In 2005 he was awarded a 5-year Clay Research Fellowship, bestowed annually upon two or three exceptionally talented young Ph.D. recipients. Speyer spent 2005-2007 at UM, and has been at the Massachusetts Institute of Technology since 2007. Speyer's broad research applies combinatorial techniques to representation theory, algebraic geometry and commutative algebra. He has done outstanding work in the areas of combinatorial representation theory, and is emerging as a clear leader among the young researchers working in the subfield of tropical geometry.



Faculty Retirements

Professor **Peter Duren** retired from active faculty status May 31, 2010.

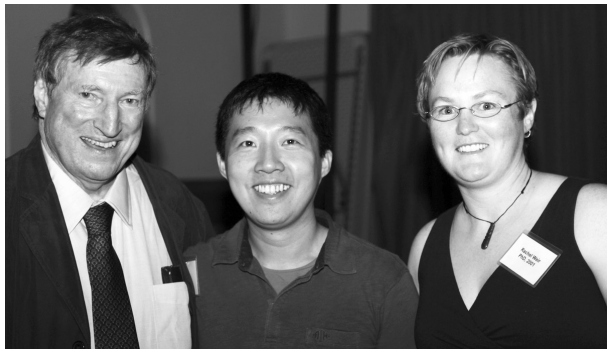
Professor Duren received an A.B. degree from Harvard University in 1956 and a Ph.D. from the Massachusetts Institute of Technology in 1960. He was an Instructor at Stanford University before joining the University of Michigan faculty as an Assistant Professor in 1962. He became a Professor in 1969.

Professor Duren's work spanned various areas of analysis, with focus on geometric function theory and linear spaces of analytic functions. Other topics have included operator theory, potential theory, planar harmonic mappings, orthogonal polynomials and history of mathematics. In recent years he has investigated Schwarzian derivatives and their relation to geometric properties of analytic functions and harmonic mappings.

A prolific writer, Professor Duren published more than 125 research papers with numerous coauthors, and has published 4 research-level books: *Theory of H^p Spaces* (1970), *Univalent Functions* (1983), *Harmonic Mappings in the Plane* (2004), and (with A. Schuster) *Bergman Spaces* (2004). A book at the undergraduate level, *Invitation to Classical Analysis*, is currently in preparation. During his 48 years in the Department of Mathematics, Professor Duren was a popular and effective teacher who taught a variety of courses at all levels and supervised the dissertations of 25 Ph.D. students.

Professor Duren served the Department of Mathematics as Associate Chair for Graduate Studies, Chair of the Doctoral Committee, and Managing Editor of the Michigan Mathematical Journal. He served on many editorial boards, and was the principal editor of the three-volume historical collection *A Century of Mathematics in America*, published by the American Mathematical Society on the occasion of its Centennial. He was elected to the Council of the American Mathematical Society and to the Board of Governors of the Mathematical Association of America. For the last ten years he served as Treasurer of the Academic Freedom Lecture Fund at the University of Michigan.

In honor of Professor Duren's 70th birthday, an international research conference was held in El Escorial, Spain, and also a special issue of the journal Complex Variables and Elliptic Equations was dedicated to him. Last summer his students arranged a retirement party at the Gandy Dancer Restaurant, a large and nostalgic reunion with former students and postdocs.



Peter Duren with former graduate students James Tung and Rachel Weir.

Professor **Arthur G. Wasserman** retired from active faculty status May 31, 2010.

Professor Wasserman received his B.S. degree from the Massachusetts Institute of Technology in 1960 and his Ph.D. from Brandeis University in 1965. He was a Pierce instructor at Harvard University before joining the University of Michigan Faculty as an Assistant Professor in 1968; he became a Professor in 1980.

Professor Wasserman's main research interest is differential topology. More specifically, he studies manifolds via their symmetry groups—the theory of transformation groups. He established the basic theorems of differential topology for manifolds with a group action, developed methods for classification of manifolds with symmetry up to cobordism and has worked on "desingularization" of group actions on manifolds and found residue theorems. Algebraic realization of manifolds and foliations are among other topics that he has investigated.

In addition, Professor Wasserman has written many papers in the field of differential equations, frequently using topological methods. For the past 20 years he has been researching the differential equations that arise in mathematical physics, specifically the Einstein equations of general relativity coupled with other fields, e.g., the Yang-Mills equations or wave maps coupled to gravity, or σ-model solitons, or mini-boson stars. Wasserman has published two monographs and over 75 papers.

During his tenure Professor Wasserman was a dedicated advisor for undergraduate students within the Department of Mathematics. He received the LSA Excellence in Concentration Advising Award recognizing his efforts. Professor Wasserman developed two mathematics courses covering computer algebra systems for beginning students in the Department. He mentored three graduate students, and served on the doctoral committees of several others. Professor Wasserman served on various College and University level committees, including the Financial Affairs Committee and the Committee for Recreational Sports.

2009-10 Graduate Program Fellowships & Awards

The Wirt and Mary Cornwell Prize in Mathematics
Kevin Tucker

Arthur Herbert Copeland, Sr. Memorial Scholars
Peter Bosler
Max Glick
Andrey Mishchenko
Xin Zhou

Cameron & John Courtney Scholarship
Aurel Fulger
Ting Wang

CONACYT - Consejo Nacional de Ciencia Y Tecnología
Gerardo Hernandez
Luis Nunez Betancourt

G. Cleaves Byers Endowment
Jeffrey Meyer

Gabrielle & Sophie Rainich Fellowship
Alexander Mueller

Luther Claborn Mathematics Fellow
Qian Yin

Juha Heinonen Memorial Graduate Fellowship
Ashley Holland

Mathematics Alumni/ Alumnae Scholarship
Sarah Mayes
Geoffrey Scott
Ashley Wheeler

Mathematics Department Graduate Fellowship
Harry Altman
David Benson-Putnins
Kevin Carde
Emily Clader
Matthew Masarik
Brittan Farmer
Balin Fleming
Nicolas Ford
Kevin Hannay
Giwan Kim
Rafe Kinsey
James Mathews
Nathan Priddis
Brandon Seward
Ariel Shnidman
Yi Su
Jeremy West
Mary Wootters
Zhechao Zhou

National Defense Science and Engineering Graduate Fellowship
Michael Chmutov
Ross Kravitz

National Science Foundation Fellow
Zachary Scherr

Natural Science & Engineering Research Council of Canada Scholarship
Eugene Eisenstein

Outstanding GSI Award
Daniel Hernandez

Rackham One-Term Dissertation Fellows
Florian Block
Jose Gonzalez
Kyle Ormsby
Ricardo Portilla
Zhengjie Xu

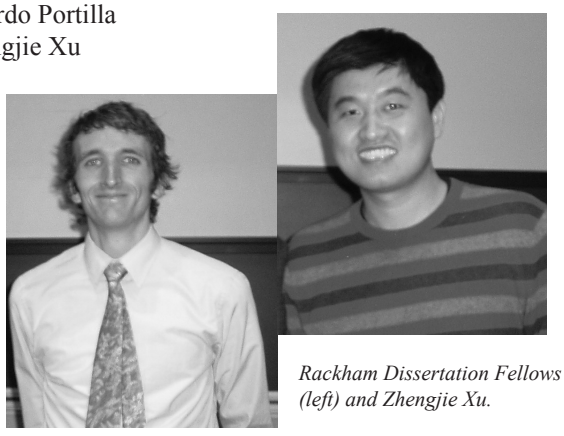
Rackham Predoctoral Fellows
Catherine Dupuis
Marc Krawitz
Johanna Mangahas

Rackham Science Award
Ashley Wheeler

Mathematics Regents Fellowship
Rafe Kinsey
Burhan Sadiq

Research Training Grant (RTG)- Algebra
Jose Gonzalez
Daniel Hernandez
Brian Jurgelewicz
Julian Rosen
Harlan Kadish
Kevin Tucker
Michael Von Korff
Chelsea Walton
Emily Witt
Brian Wyman

Research Training Grant (RTG)- Geometry
Daniel Kneezel
Sara Lapan
Michelle Lee
Robin Lassonde
Kyle Ormsby
Felipe Ramirez
Jordan Sahattchieve
Nina White
Crystal Zeager



Rackham Dissertation Fellows Kyle Ormsby (left) and Zhengjie Xu.

Allen L. Shields Fellowship
Victor Lozovanu

Sumner B. Myers Memorial Prize
Paul Johnson
Alan Stapledon

Departmental Spring Scholarship
Samuel Altschul
Florian Block
Ernest Brooks
Sohhyun Chung
Eugene Einstein
Timothy Ferguson
Aurel Fulger
Huaiying Gu
Shawn Henry
Xueying Hu
Yu-Jui Huang
Zhao Lan
Seung Jin Lee
Kin Kwan Leung
Sijun Liu
Linquan Ma
Lindsey McCarty
Hieu Ngo
Luis Nunez Betancourt
Tomoki Ohsawa
Ricardo Portilla
Burhan Sadiq
Paul Shearer
Yefeng Shen
Mark Shoemaker
Daniel Starinshak
Nathan Totz
Aditi Vashist
Ting Wang
Jordan Watkins
Benjamin Weiss
Jinchen Wu

Recent Doctorate Degrees

Henry Boateng completed his dissertation "*Topics in Computational Chemistry*" under the direction of Robert Krasny. He will be a Postdoctoral Fellow at UM.

Beth Chen completed her dissertation "*A Picturebook of Tetrahedral Packings*" under the direction of Jeff Lagarias.

Jiarui Fei completed the dissertation "*General Presentations of Algebras*" under the direction of Harm Derksen.

Johnson Jia completed the dissertation "*The Arithmetic of Yoshida Lifts and Applications*" under the direction of Chris Skinner. Johnson will be a Postdoctoral Fellow at PIMS/Univ. of British Columbia.

Brian Jurgelewicz completed his dissertation "*McKay's Correspondence for Klein's Quartic Curve*" under the direction of Igor Dolgachev.

Marc Krawitz completed his dissertation "*FJRW Rings and Landau-Ginzburg Mirror Symmetry"* under the direction of Yongbin Ruan. He will be an Associate Consultant at McKinsey & Co.

Catherine Kublik (below) completed her dissertation "*Topics in PDE-Based Image Processing*" under the direction of Selim Esedoglu. She will be a Postdoctoral Fellow at the Univ. of Texas.

Victor Lozovanu completed his dissertation "*Invariants in Algebraic Geometry*" under the direction of Rob Lazarsfeld. He will be a Coleman Postdoctoral Fellow at Queen's Univ. in Ontario.

Johanna Mangahas completed her dissertation "*On Subgroups of Mapping Class Groups*" under the direction of Juan Suoto. She will be a Tamarkin Assistant Professor at Brown University.

Tomoki Ohsawa completed the dissertation "*Nonholonomic and Discrete Hamilton-Jacobi Theory*" under the direction of Tony Bloch. Tomoki will be a Teaching Visitor/Postdoctoral Fellow at Univ. California San Diego.

Kyle Ormsby completed his dissertation "*Computations in Stable Motivic Homotopy Theory*" under the direction of Igor Kriz. He will be a Moore Instructor at MIT.

Felipe Ramirez completed his dissertation "*Smooth Cocycles Over Homogeneous Dynamical Systems*" under the direction of Ralf Spatzier. He will be a Postdoctoral Researcher at Univ. of Bristol, UK.

Nicholas Rupprecht completed his dissertation "*Effective Correspondents to Cardinal Characteristics in Cichoń's Diagram*" under the direction of Andreas Blass. He will be a Derivative Trader at Virtu Financial.

Luis Serrano completed his dissertation "*Non-Commutative Schur P-Functions and the Shifted Plactic Monoid*" under the direction of Sergey Fomin. He will be a Postdoctoral Fellow at Univ. of Quebec.

Kelli Talaska completed her dissertation "*Positivity in Real Grassmannians: Combinatorial Formulas*" under the direction of Sergey Fomin. She will be a NSF Postdoctoral Fellow at Univ. California Berkeley.

Kevin Tucker (left) completed his dissertation "*Jumping Numbers and Multiplier Ideals on Algebraic Surfaces*" under the direction of Karen Smith. He will be a NSF Postdoctoral Fellow at Univ. of Utah

Lei Wang completed the dissertation "*Radial Basis Functions and Vortex Methods and their Application to Vortex Dynamics on a Rotating Sphere*" under the direction of Robert Krasny.

Brian Wyman (below) completed his dissertation "*Polynomial Decomposition over Rings*" under the direction of Michael Zieve. He will be a Research Group Member at PNYLAB.

Zhenjie Xu completed the dissertation "*Asymptotic Analysis and Numerical Analysis of the Benjamin-Ono Equation*" under the direction of Peter Miller. Zhengjie will be a Financial Software Developer at Bloomberg.

Hsu-Wen Young completed the dissertation "*Components of Algebraic Sets of Commuting and Nearly-Commuting N-Tuples of Matrices*" under the direction of Mel Hochster.

Graduate Program Report

The Mathematics Graduate Program continues to excel at attracting and supporting bright mathematicians. In the most recent U.S. News & World Report rankings, UM Mathematics moved up slightly, sharing 8th and 9th places with UCLA. We also kept our top-10 positions in Algebra/Number Theory, Analysis, Discrete Math/Combinatorics, Geometry and Topology. While we try not to place too much emphasis on the rankings, they greatly impact graduate recruiting and admissions.

The 2010 recruiting for graduate students included 596 student applications. During the recruitment weekend, 17 students visited the Department and met with faculty and students. At other times during the year, nine other students visited the department. A total of 54 offers of admission were made for the main Ph.D. program, and 18 accepted and started in 2010. In the Applied and Interdisciplinary Mathematics program, 15 offers were made and 6 accepted.

Our graduate students continue to make great strides in research, both independently and in collaboration with colleagues. As highlighted in last year's newsletter, Beth Chen had made a breakthrough in tetrahedra packing, the results of which were bettered by other researchers. In collaboration with colleagues in the College of Engineering, Beth was able to again achieve a greater density in the packing of tetrahedra. Her achievements were highlighted in various media outlets, including the New York Times.

We continue to support our current cohort of graduate students through grants, fellowships, research assistantships and, of course, graduate student instructor appointments. The participation of the graduate student population in departmental seminars and colloquia adds vibrancy and energy to the events.

Undergraduate Program Highlights

The Undergraduate Mathematics Program continues to enjoy remarkable growth. For example, the sequence

53, 77, 75, 70, 51, 71, 59, 93, 92, 99, 117, 126, 140, 149

describes the number of students receiving a Michigan Mathematics bachelor's degree each year since 1996-1997. While not monotonic, it does show a healthy upward trend. Similarly, the total number of mathematics minors awarded has increased from 23 in 2000-2001 to 118 last year. In fact, as of Winter Term 2010, mathematics has the 7th largest number of concentrators among departments in the College of Literature, Science and the Arts, and only romance languages has more minors. Despite this dramatic increase in quantity, the Department continues to attract increasing numbers of high quality students to the program. This is due in no small part to the reputation that Michigan Mathematics enjoys: the Department is known, domestically and internationally, both for doing an excellent job of preparing its students and for nurturing a tight-knit, strong community of students who are passionate about mathematics.

Scholarships and Awards: The Department is fortunate to have the capability to offer scholarships totaling over $160,000 to students this year. Several of these scholarships go to first year students and were awarded based on the students' high school achievements in mathematics. In addition to the awards and recognition that the Department gives to undergraduates (see listing on page 10), mathematics students frequently achieve national recognition. For example, David Montague was awarded a Barry M. Goldwater Scholarship, and he received a 2010 Astronaut Foundation Scholarship (see the write-up on page 11). As another example, senior Ruthi Hortsch received an Honorable Mention for the Alice T. Schafer Award from the Association for American Women in Mathematics, as well as an honorable mention for a Goldwater Scholarship.

Honors Program: The Department's Honors Program continues to prosper. There are 55 honors mathematics majors, and an additional 27 LSA honors students with mathematics concentrations. Among the 2010 graduating honors students, at least two will be working in industry, at least five are pursuing mathematics doctorates at prestigious institutions and at least six others are entering Ph.D. programs in other disciplines (computer science, physics, economics).

The Department has been hosting informal reunions of honors students who completed the 90s sequence during the past 10 years. These gatherings always occur during the University's Recent Grad Weekend, usually on Saturday morning. Please contact the Department if you are interesting in attending.

Extracurricular Activities: The Undergraduate Mathematics Club continues to meet weekly for pizza, pop, and a mathematics presentation. This event attracts over 40 students each week, and it remains free to participants. Department resources for this activity have been limited, and additional sources of funding are actively being sought.

SAM, the student actuary club, continues its long tradition of serving the student actuaries and providing an outlet for their prowess at volleyball and broomball. This year they are joined by SUMS (the Society of Undergraduate Mathematics Students) and QIC (the Quantitative Investment Club). While SUMS aims to be the social organization for the Department, QIC is dedicated to serving the needs of the financial mathematics students.

The annual Mathematics Career Conference has become extremely popular among the undergraduate

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Undergraduate Degree Recipients

Khairul Azahari Abdul Aziz
Hamidah Khairiyyah Abdul Rahman
Carly Ahrens
Alexis Amsden
Michael Arbit
Eric Barkley
Peter Bartlett
Blain Baumgardt
Marc Beauchamp
Derek Bedoya-Skoog
Michael Bell
Daniel Bin
Tamar Blanc
Timothy Blasius
Alyssa Bolduan
Allison Born
Murtuza Boxwala
Lauren Branstner
Patrick Burke
Jose Carlo Becerra
Clairine Jia Jia Chan
Yuk Shan Chan
Lai Ieng Chao
Kathryn Chen
Alan Chern
Hui Ying Chin
Sung Hoon Cho
Yun Choi
Seifu Chonde
Mei Chen Chua
Daniel Chun
Lance Clevenger
Nicholas Comment
Monica Cooney
Ryan Cotton
Emily Cummins
Lydia Czabaniuk
Devika Daga
Evan Davis
Katrina Deady
Jared Dickow
Daniel Dimond
Mellisa Dimoski
Emily Drook
Mark Duhaime
Daniel Echlin II
Sahar Emambakhsh
Adam Emerson
Nasir Fakhri
Benjamin Feldman
Jackelyn Ferman
Michelle Fleshner
Rohan Fray
Allison Frayer
Nilton Gjeci
Sriakhil Gogineni
Anna Gottschlich
Lu Guo
Dennis Habecker
Lesley Hairston
David Hanna
Daniel Hanselman
Daniel Hermes
Bruce Hicks
Wade Hindes
Poh Choo Ho
Zili Huang
Lara Hulbert
Julie Huth
Richard Ireland
Anna Jacobson
Matthew Johnson
Lisa Kalenkiewicz
Kyle Kalmbach
Hyun-Kyu Kang
Andrew Kiluk
Chul Kyu Kim
Stella Kim
Mary King
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Above: Professor Harm Derksen (l) with UM's top three scorers in the Putnam Competition (l-r) Nicholas Triantafillou, Daniel Hermes and Paul Lewis.

Right: Margaret S. Huntington Award presentation (l-r) Shuhan Wang, Alison Tseng, Professor Huntington, Caroline Thompson, Krista Soltis and Elizabeth Keenan.

Undergraduate Awards

Putnam Competition

The Department's team for the 2010 William Lowell Putnam Competition placed 19th in the competition. The members of the team were Daniel Hermes, Zili Huang and Ruthi Hortsch. In the individual competition, Paul Lewis placed highest of the UM students at 75. The placement of other UM students in the competition included Daniel Hermes (113.5), Nicholas Triantafillou (128.5), and Han Qi (157).

In the 27th Annual University of Michigan Undergraduate Mathematics Competition Nicholas Traintafillour placed first and Feiqi Jiang was second.

Margaret S. Huntington Awards in Actuarial Outreach

Jason Guan
Katelyn Hummer
Elizabeth Keenan
James Hyunwoo Kim
Marissa Lafata
Yiyi Lu
Krista Soltis
Sukwoo Suh
Caroline Thompson
Alison Tseng
Shuhan Wang
Chirapon Wangwongwiroj

Evelyn O. Bychinsky Awards

recognizing underclass students who show exceptional promise in mathematics:

Justin Campbell
Alexander Carney
AnnieJae Fischburg
Cassandra Hall
Geoffrey Iyer
Feiqi Jiang
Christopher Link
Claudia Raithel

Leon P. Zukowski Prize

recognizing outstanding service in the Mathematics Learning Center:

Hui Ying Chin (left)

Sumner B. Myers Award in Analysis

David Clyde

William LeVeque Award in Number Theory

Chris Xiu

Jack McLaughlin Award in Algebra

Paul Lewis

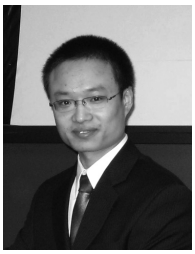
George Piranian Excellence in Mathematical Writing Award

Ruthi Hortsch

Wilfred Kaplan Award in Applied Mathematics

Rebekah Bartlett

Mathematics Alumni/Alumnae Scholarship



Chris Xiu (right)

Risk & Insurance Mathematics Society, Detroit Chapter Scholarship

Caroline Larder

Outstanding Achievement in Mathematics Awards

Blain Baumgardt
Marc Beauchamp
Mark Duhaime
Lara Hulbert
Kyle Kalmbach
Xuan Liang
Brian Mann
So-Young Nam
Brian Nixon
Kimira Ruelle
Meelap Shah
Peng Song
Sacha van der Spek
Alexander Xie

Otto Richter Memorial Prize in Actuarial Science

Wan Yinh Teoh

Lois Zook Levy Award

recognizing an outstanding mathematics student who plans to pursue a career in K-12 mathematics education:

Michael Arbit

Michigan Mathematics Merit Scholar

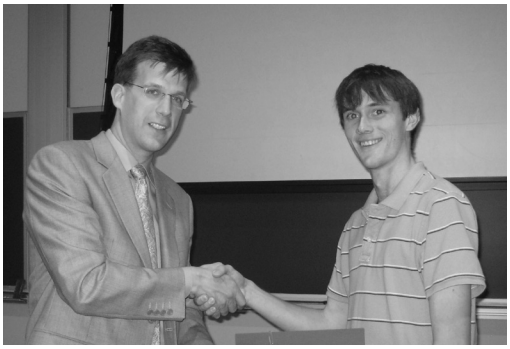
Yun Choi
Wade Hindes
Zili Huang
Andrew Kiluk
Joshua Lim
Steven Moses

Outstanding Graduating Senior

Daniel Hermes

Wirt and Mary Cornwell Prize in Mathematics

David Montague



Undergraduate Program Director Stephen DeBacker presents the Sumner Myers Award in Analysis to David Clyde (above) and an Evelyn Bychinsky Award to AnnieJae Fischburg (right).

Mathematics Major Receives Astronaut Scholarship

Apollo 15 command module pilot and UM alumnus Al Worden awarded senior David Montague a $10,000 scholarship from the Astronaut Scholarship Foundation. At the presentation, Worden emphasized the importance of mathematics in the space program and in other career areas. "You cannot get to the moon unless you do your math," he said.

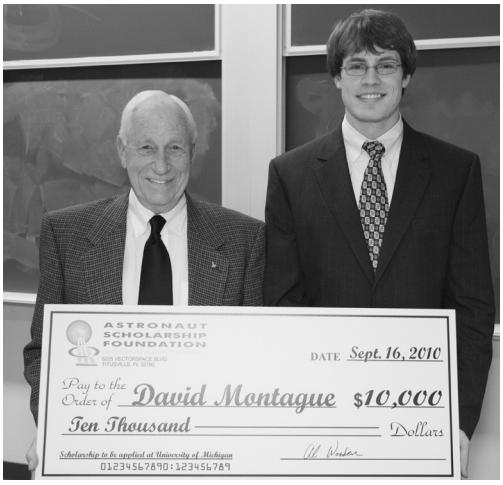
Worden, who received master of science degrees in astronautical engineering and instrumentation engineering from UM in 1963, presented a talk to the Math Club and other department members in September 2010. He shared his experiences on Apollo 15, including his record-setting "farthest-from-earth" space walk during the nearly 300 total hours Worden logged in space.

"It is my honor to be presenting David with the Astronaut Scholarship Foundation Award," said Worden, who also serves as ASF Chairman. "He is a dedicated researcher in the field of mathematics; this, paired with his passion and enthusiasm for the field, makes him an exceptional scholar. It is vital that America remains a technological leader in the world and that responsibility rests upon future generations."

Montague is majoring in mathematics, with a 4.0 GPA. His research in number theory has led to several published papers and conference presentations. He plans to earn a doctorate and pursue an academic career. In his personal time, he tutors young students in math and pursues martial arts.

The Astronaut Scholarship is the largest monetary award given in the United States to science and engineering undergraduate students based solely on merit. Twenty scholarships were awarded this year through the ASF to outstanding college students majoring in science, engineering or math. More than $3 million has been awarded in scholarships to date. Since 2007, $40,000 has been awarded to UM students.

The Astronaut Scholarship Foundation is a non-profit organization established by the Mercury Astronauts in 1984. Its goal is to aid the United States in retaining its world leadership in science and technology by providing scholarships for exceptional college students pursuing degrees in these fields. Today, more than 80 astronauts from the Gemini, Apollo, Skylab, Space Shuttle and Space Station programs have joined in this educational endeavor.



Al Worden and David Montague

Center of Actuarial Excellence at Michigan

In 2010, the Actuarial Program within the Department of Mathematics was recognized as a SOA Center of Actuarial Excellence (CAE) by the Society of Actuaries (SOA). UM is now one of 17 such designated programs in the U.S. and Canada. The 5-year designation allows the program to be eligible for grants from the SOA for education or research. The CAE program was developed to strengthen the position of the academic branch of the profession by supporting research that expands the boundaries of actuarial science, while promoting the development of intellectual capital and identifying opportunities for its application.

The programs at each of the designated schools met eight rigorous criteria and specific requirements related to degree curriculum, graduate count and quality, faculty composition, appropriate integration, connection to industry and research/scholarship in order to qualify for the CAE distinction.

"The decision to apply for CAE status was spurred in large part by our alumni/ae base," says Curtis Huntington, Actuarial Program Director. "Our faculty participated in the application process, and several graduates wrote letters of support as well."

"The universities that have been named Centers of Actuarial Excellence exemplify the highest standards in actuarial education, research and scholarship," noted S. Michael McLaughlin, president of the SOA. "We are thrilled to recognize them for this accomplishment and look forward to building strong links between these universities and the profession."

The designation assures that the UM Actuarial Program will continue to be among the leaders and best in the field.

Many Thanks to our Generous Supporters

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We Need You!

Want to get involved with the UM Department of Mathematics? Here are some areas where alumni participation is vital. Contact us if you are interested in working with us on these initiatives.

- Recommend the UM mathematics program to students interested in undergraduate or graduate studies.
- Participate in our annual Career Day, held each year in late October/early November.
- Visit the Department for afternoon tea (weekdays at 3:45 sharp) if you are in town for the weekend, including Homecoming, Parent's weekend, or the Presidential Society weekend.
- Set up a recruiting program with your company for graduating students.
- Offer internships in your company to mathematics students.
- Allow groups of mathematics students to visit your company.
- Give an informal talk to mathematics students about how you have used your math knowledge.

Email: math.mich@umich.edu
or call 734-647-4462

Undergraduate Program

(*continued from page 8*)

population. Last year, over 300 students attended the event. The Department is always looking for alumni/ae who are willing to share their experiences and discuss career options with the current undergraduates. Please contact the Department if you would like to participate in this event.

Finally, Michigan's mathematics students have done some travelling. In 2009, four mathematics students (Dan Hermes, Ruthi Hortsch, Zili Huang, and Feiqi Jiang) participated in the International Mathematics Competition in Budapest. The team performed well. With the assistance of funding from various faculty members, four mathematics majors were able to attend the 2010 Conference for Undergraduate Women in Mathematics in Nebraska. Several students, including juniors Justin Campbell and Alex Carney, travelled to present their research results at mathematical conferences in places like Ohio State and the University of Illinois at Chicago. As funding allows, the Department would like to continue to offer these types of opportunities to its students.

To see more Math T-shirt photos, go to www.math.lsa.umich.edu/undergrad/ and follow the link.

To order your own T-shirt, contact the Math Department.

Right: Students listen intently to a Math Club presentation.

Below: An enthusiastic crowd participates in the 2009 Mathematics Department Career Day.

Page 15 photos
Row 1: Current math majors show their spirit at the Big House; junior Geoffrey Iyer and his dad at Tirupati, India.
Row 2: Sophomore Daniel Hast on the Continental Divide in the Rockies; junior Sarah Walker and her brother Jeff, Grenoble, France.
Row 3: Bob (BS 1975) and Nancy Nelson on the Panama Canal; juniors Michael Norman and Greg Affeldt in Cadillac, MI.
Row 4: Dan Hermes (BS 2010) rides an elephant in Budapest; Allan Compton (BA 1974) and daughter Katie in Nice, France; Curtis Huntington (BA 1964) in Wellington, New Zealand.

Alumni Updates

James Stasheff (BA 1956, Ph.D. Princeton 1961, D. Phil. Oxford 1961) is a Professor Emeritus at University of North Carolina, Chapel Hill. He is currently a Visiting Professor at the University of Pennsylvania.

Michael L. Frank (BS 1987) is President and Actuary at Aquarius Capital in New York. He was elected President of the Actuarial Society of Greater New York for 2011.

Adam Coffman (BS 1991, Ph.D. U. Chicago 1997) is an Associate Professor in Mathematics at Indiana University – Purdue University Fort Wayne. He recently published the monograph "Unfolding CR Singularities" in the Memoirs of the American Mathematical Society.

Greg Buzzard (Ph.D. 1995) was promoted to Professor of Mathematics at Purdue University.

Saburo "Sab" Matsumoto (Ph.D. 1995) is a Professor at the College of the Canyons in California.

Stephanie (Molnar) Salomone (BA 1997, MA Boston College 1999, Ph.D. UCLA 2005) is an Assistant Professor of Mathematics at the University of Portland, Oregon.

Zachary Maddock (BS 2008) was awarded a 2010 National Science Foundation Graduate Research Fellowship. He is a graduate student at Columbia University.

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