ContinuUM

University of Michigan
Department of Mathematics
NEWSLETTER • 2016

Math Circle Goes on the Road

The department's Math Circle program (see www.math.lsa.umich.edu/mathcircle), which hosts area middle and high school students each Thursday evening to discuss and solve math problems, has joined with the University's Wolverine Pathways program to pilot Math Circles in Southfield, MI and Ypsilanti, MI. Wolverine Pathways is a free, year-round program that partners with families, schools, and communities to provide learning experiences that will help participating students succeed in school, college and future careers. All Wolverine Pathways Scholars who successfully complete the program, apply to the University of Michigan, and are admitted will receive a full, four-year tuition scholarship (see wolverinepathways.umich.edu).

Throughout the fall, members of the department have travelled to Southfield and Ypsilanti to run twelve two-hour long Math Circles for about 240 eighth and eleventh graders each Saturday morning. Consistent with the department's belief in the importance of Inquiry Based Learning, Michigan's Math Circles emphasize the process of mathematical discovery and open-ended exploration. Over 100 faculty, graduate students, undergraduate students, and friends of the department have volunteered to help with Math Circles this fall, and on any given Saturday about twenty-five volunteers meet before dawn to travel to the two sites. The experience has been exhausting, fun, and rewarding for the volunteers, and the students are eager to learn and (mostly) enthusiastic about the mathematics explored in the Circles.

Math faculty and students prepare to present a Math Circle utilizing a pineapple to illustrate Fibonacci numbers.

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View From the Chair's Office
Mel Hochster

This is the ninth and last year of my term as chair, and this is the last time I will be writing this column as chair of the department. Over my past three terms as chair, I have seen the department, College, and University persevere through tough social and economic times. On the eve of the University's bicentennial, it is apparent that there are still a variety of challenges facing our institution, but the good outweigh the bad.

One of the most rewarding aspects of serving as chair is the chance to participate in the hiring of new faculty. I am most appreciative of having had the opportunity during my term as chair to be part of the hiring of seventeen people in tenured and tenure-track positions, as well as eight at the level of Lecturer III in support of our Introductory, Mathematics Education, and Actuarial Programs. These new faculty are outstanding as both teachers and scholars.

The implementation of the Provost's initiative to reduce section sizes in many classes in our introductory program continues. The achievement of the department as both an outstanding research center and a place where innovation in teaching has had national impact is nothing short of amazing. I am very happy to be able to say that last April the department received the LSA Student Government's Departmental Award of Excellence.

Our Applied and Interdisciplinary Mathematics Program aspires to bring in people who will interact strongly with other departments: this year we will be searching to fill a joint position with the Department of Molecular, Cellular, and Developmental Biology, continuing in the department's strong interdisciplinary tradition.

The Michigan Center for Applied and Interdisciplinary Mathematics (MCAIM) began this October under the direction of John Schotland (see story on page 3). The

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Inside

Inquiry Based Learning in Linear Algebra

Math 217 (Linear Algebra), a gateway course required of all math majors and most minors, has undergone significant changes in recent years in connection with the Provost's Faculty Enhancement Program and small class size initiative, and the department's increasing move toward interactive classrooms.

One of six linear algebra courses offered by the department, Math 217 is where students acquire the essential proof-writing skills that are required in more advanced courses. For years the course was taught in a lecture format with sections of 30-35 students, but beginning in the 2014-15 academic year with sections taught by Gavin Larose, it has gradually transitioned to being one of the department's many IBL courses and is now taught in sections of 18 students using dedicated classrooms.

Inquiry Based Learning (IBL) is a method of teaching that embraces active, collaborative, student-directed exploration of subject matter in place of traditional lectures. Students in IBL classrooms work in small groups, under the guidance of an instructor, to solve problem sets that lead students to explore and develop material in their own way.

As a recent 217 student observed, "In this class, a student plays both a student's and a teacher's role...The group work and the community formed through interactive class time really improves your learning and makes you so much more interested."

The change is part of a growing trend within the wider mathematics education community and particularly within the Michigan Math Department, which houses an IBL Center directed by Ralf Spatzier. The Center promotes the teaching and development of IBL by training faculty members and graduate students in IBL methods, creating courses and materials, organizing IBL workshops and lunches, supporting other outreach such as Math Circles, and partnering with Vilma Mesa of the School of Education to run observations and assessments of IBL classrooms. Spatzier and Mesa oversee instructor and student focus group interviews in all sections of the department's 16 IBL courses. Their efforts put Michigan Math at the forefront of a movement in math and science education toward active learning that in July received the endorsement of the Conference Board of the Mathematical Sciences (CBMS), an umbrella organization of some of the most important professional societies in the mathematical sciences.

Sections of Math 217 now meet in the computer labs in the basement of East Hall, where the labs are set up with group work stations and are lined with dry erase boards for students to use during class. On a typical day, students will spend the majority of the 80-minute class working in small groups at the boards on worksheet problems that have been carefully designed by the instructor to introduce and develop course material. The students engage in constant verbal and written communication with each other and with the instructor as they actively build their understanding of the material. Remaining class time is usually spent on brief instructor lectures, student presentations, explanations of solutions, or summaries of main ideas.

This new format is made possible by the Provost's recent initiative to reduce class sizes in the introductory courses to 18 students, and by the attendant hiring of new faculty members through the Provost's Faculty Enhancement Program. The move has also required—and benefitted from—an increased coordination among the various sections of the course. Overhauling course format and increasing coordination are never easy, but the department's broad dedication to teaching and support of IBL helped to make the transition relatively quick and painless. With structural supports such as weekly course meetings, a dedicated coordinator, and a large repository of instructors' worksheets now in place, Math 217 should be a permanent addition to the department's growing list of IBL courses, furthering a trend toward interactive classrooms.

Scott Schneider, Lecturer III

website: lsa.umich.edu/math/centers-outreach/ibl-center-for-inquiry-based-learning

Griess Named Distinguished University Professor

Robert L. Griess Jr., has been named the John Griggs Thompson Distinguished University Professor of Mathematics. He was formerly the Richard D. Brauer Collegiate Professor of Mathematics.

Griess received his undergraduate and graduate degrees at the University of Chicago, studying with adviser John Thompson, and wrote a thesis on central extensions of simple groups. In 1971, he became a Hildebrandt Instructor at the University of Michigan, and has continued his career here, being named professor in 1981.

Throughout his career, Griess has made pioneering discoveries in the areas of finite groups, finite aspects of Lie theory, vertex algebras, and rational lattices. His 1980 construction of the Monster, the largest of the sporadic simple groups, represented a breakthrough in theory and helped open new connections within mathematics and with theoretical physics.

Griess helped draft math department guidelines for Ph.D. students in the 1970s and set up the department's first computers in the 1980s. He led the department's King/Chavez/Parks College Day Visitation Program for 15 years and now recruits for U-M's Center for Educational Outreach. He was recognized with the Harold R. Johnson Diversity Service Award in 2003. Griess is a member of the American Academy of Arts and Science and is an American Mathematical Society fellow. In 2010, he received the American Mathematical Society's Leroy P. Steele Prize for Seminal Contribution to Research.

Additionally, Griess has been honored with a Guggenheim Fellowship and presented an invited address at the 1983 International Congress of Mathematicians. He has held visiting positions at Rutgers University, the Institute for Advanced Study, Yale University, École Normale Supérieure in Paris, University of California Santa Cruz, National Cheng Kung University in Taiwan, and Zhejiang University in China. Recently, he has been a frequent visitor to Academia Sinica in Taipei, lectures frequently at conferences around the world, does service for the American Mathematical Society, and works for educational outreach to underrepresented groups.

Griess named his professorship after his thesis director, John Griggs Thompson, whose work in the area of finite group theory has been recognized with the Fields Medal in 1970, the Wolf Prize in 1992 and the 2008 Abel Prize.

New MCAIM Center Established

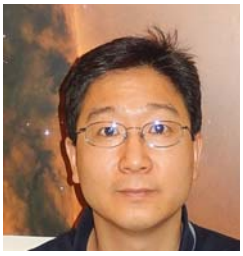
The University of Michigan Center for Applied and Interdisciplinary Mathematics (MCAIM) officially launched this fall with an opening workshop on October 17-18. Professor of Mathematics John Schotland serves as the director of the Center. Provost Martha Pollack gave opening remarks and launched the program. The speakers for the event were: Liliana Borcea (UM), Russel Caflisch (UCLA), Robert Calderbank (Duke), Bernard Chazelle (Princeton), Bjorn Engquist (Univ. of Texas-Austin), Charles Epstein (Univ. of Pennsylvania), Sharon Glotzer (UM), Thomas Hou (Cal Tech), Robert Kohn (New York Univ.), George Papanicolaou (Stanford), and Gunther Uhlmann (Univ. of Washington). A broad spectrum of topics in applied mathematics were discussed, ranging from fluid dynamics to imaging to population genetics.

Professor Liliana Borcea presents at the inaugural MCAIM conference.

The University of Michigan is home to an outstanding cohort of applied mathematicians. While many of these individuals are based in the Department of Mathematics, UM also has an unusually large number of faculty with advanced mathematical training across campus, including other LSA departments, the College of Engineering, the School of Medicine, the School of Public Health and the School of Information. The long-term goal of MCAIM is to establish UM as an international leader in the field of applied mathematics. To this end, MCAIM will host a variety of programs and events, highlighting leading researchers and cutting-edge developments at the interface between mathematics and other sciences. Topical workshops and advanced summer schools for graduate students and postdoctoral fellows will bring 20-30 researchers to campus to explore themes on frontier topics in applied mathematics. The Center will also promote applied mathematical research at UM by other means such as aiding searches for external funding and facilitating collaborative interactions.

In addition to programs and events, MCAIM sponsors the Van Loo postdoctoral assistant professorships to recruit the most talented and promising young applied mathematicians at an early stage of their careers. Up to three new Van Loo postdocs will be selected per academic year for a three-year term. The current Van Loo postdocs are James Bothner (mathematical physics), David Goluskin (applied nonlinear dynamics), Howard Levinson (inverse problems), and Ian Tobasco (nonlinear partial differential equations).

Faculty News



Professors Jinho Baik and **Michael Zieve** are two of the 37 recipients of 2016 Simons Fellowships, joining an elite group of faculty at schools including Berkeley, MIT, Princeton, and Stanford. These fellowships provide funds enabling faculty to take a semester long leave from classroom teaching and administrative obligations, in order to focus their efforts on doing research with significant scientific impact. The Simons Fellowships are provided by the Simons Foundation.

Charles R. Doering, the Nicholas D. Kazarinoff Collegiate Professor of Physics, Mathematics, and Complex Systems, has received a Guggenheim Fellowship for 2016. He will use the fellowship to collaborate on some of the most fundamental problems in mathematical fluid dynamics using a novel form of computationally aided analysis. He is pictured here in his typical UM football game gear (photo by Katie Kildee, MLive.com).

Gehring Associate Professor Barghav Bhatt has received the Compositio Mathematica Prize, in recognition of his paper "Derived splinters in positive characteristic" Compositio Mathematica 148 (2012), no. 6, pp 1757-1786. The prize is awarded every third year by the Foundation Compositio Mathematica in recognition of an outstanding piece of mathematical research that is published in the journal Compositio Mathematica during a three year period.

The research of **Professor Danny Forger** and his colleagues has recently received significant recognition in the press. Forger collected data on sleep patterns from users of his Entrain app, and the results were publicized worldwide. Time magazine highlighted actual results, and the magazine Wired focused on the technical methods. The LA Times also included a comprehensive story. International coverage included CBC and BBC.

Postdoc Assistant Professor Leonardo Colombo has received the Vincent Caselles Prize, an early career award created in 2014 by the Banco Bilbao Viscaya Argentaria (BBVA) Foundation and the Royal Spanish Mathematical Society. It recognizes the work done by researchers under the age of 30 who have defended their Ph.D. theses in Mathematics in Spain within the last three years. This is the second most important prize for mathematicians in Spain.

Associate Professor Sarah Koch has received the 2016 Class of 1923 Memorial Teaching Award from the College of LSA. The award recognizes assistant professors who have demonstrated outstanding teaching ability during their first years on the faculty. The recipients also have achievements in research which will lead to a productive career as a scholar, teacher and mentor.

Promotions:

Sarah Koch and **Andrew Snowden** were both promoted from Assistant Professor to Associate Professor with tenure.

Photos by UM Photo Services, the Department of Mathematics, or submitted by the subjects.

www.lsa.umich.edu/math

New Faculty

Tasho Kaletha joined the depatment in 2016 as an Associate Professor with tenure. He received his Ph.D. in 2010 from the University of Chicago under the supervision of Robert Kottwicz. He spent three years as a Veblen Research Instructor, which is a joint appointment between Princeton University and the Institute for Advanced Study. Since 2013, he has been an Assistant Professor at Princeton University. In 2015 he was on leave from Princeton as a Benjamin Peirce Fellow at Harvard University. In 2015, Kaletha received a Sloan Research Fellowship.

Professor Kaletha's research combines several branches of mathematics, especially number theory and representation theory. He has made contributions to several aspects of the so-called Langlands program. This program, initiated by Robert Langlands around 1970, proposes connections between topics that at first seem very unrelated, including number theory, complex analysis, and group representation theory. It has been of central importance, especially in number theory, ever since. Professor Kaletha's work has also touched on endoscopy, harmonic analysis, and Galois cohomology. His research is noted for the clarity that it provides to some of these previously mysterious situations.

Johannes Muhle-Karbe joined the department in 2016 as an Associate Professor with tenure. He received his Ph.D. in 2009 from the Technische Universität München under the supervision of Professor Jan Kallsen. He then spent a year in a postdoctoral position at the University of Vienna. From 2010 to 2015 he was an Assistant Professor of mathematical finance at ETH in Zürich.

Professor Muhle-Karbe's research is in mathematical finance, and he is recognized as one of the top young experts in this area. His Ph.D. thesis provided methods for solving complex problems that are of great interest but had previously been considered hopelessly intractable. The central difficulty that he attacked there was that transaction costs, a form of "friction" in financial markets, severely complicate the computations that need to be done for financial purposes. Professor Muhle-Karbe invented ways to compute optimal strategies in such markets, by taking advantage of methods that had previously been developed for the easier case of frictionless markets. In more recent work, he has developed even more fundamental methods, dealing with different sorts of transaction costs (fixed costs, costs proportional to the size of the transaction, etc.) as well as other types of friction in markets.

Since arriving in January, 2016, Professor Muhle-Karbe has worked with the Quantitative Finance and Risk Management Masters program to help establish the curriculum and mentor the incoming students.

Math Circle

(*continued from page 1*)

Once admitted, Wolverine Pathways scholars take part in the program every year through the completion of their senior year in high school. Students are selected based on their credentials, which include a minimum 3.0 GPA in addition to their involvement in extracurricular activities and an interest or involvement in community service. The program, which is part of the university's continued efforts to increase the population of underrepresented minorities on campus, has provided students with incentive to perform well in the classroom while encouraging them to be involved in the community.

Math Problem

An island has a population of chameleons of which, currently, 21 are blue, 34 are maize, and 47 are green. Whenever two chameleons of different colors meet, they both change to the third color. There are no color changes otherwise. Is it possible that at some future time a sequence of meetings will lead to their being all the same color? Prove your answer.

This problem was part of the 2014 UM Undergraduate Mathematics Competition. The solution, as well as other problems from all years of the compention, can be found on the undergraduate section of the Math Department website lsa.umich.edu/math.

View from the Chair's Office

(*continued from page 1*)

kick-off Symposium was held October 17-18, with a stellar array of speakers: see https://sites.google.com/a/umich.edu/mcaim/. The Center currently has funding from a bequest from James Van Loo, as well as from LSA, the School of Engineering, and the Department of Mathematics.

Michigan is a locus of constant research activity that garners national attention. I had the great pleasure of being one of the organizers last July for a conference in honor of Craig Huneke, who came to UM as a postdoc in the Michigan Society of Fellows in 1978, and is currently Marvin Roseblum Professor and Chair at the University of Virginia. There were 150 participants, including many young mathematicians. The conference generated a great deal of excitement as two of the speakers, Jason McCullough and Irena Peeva, in a joint talk, made a surprise announcement of a counter-example to the thirty year old Eisenbud-Goto conjecture. Jason is the Ph.D. student of Sankar Dutta, who is a UM Ph.D. alum, and Irena, now a professor at Cornell University, was a postdoc here.

We were greatly saddened by the passing this year of Wilfred Kincaid, at the age of 98, and of Maxwell Reade, at the age of 100. Both continued to visit the department until quite recently. Maxwell was at our December holiday party the year before last, displaying his wry sense of humor. Wilfred remained keen on discussing Putnam problems with me over a stretch of many years. They will be long remembered.

This year marks the 20th anniversary of our Mathematics Career Conference, held on November 4, 2016. Our alumni are invited to visit and explain what their careers are like to our current students. If alumni cannot make the career conference, our award-winning Undergraduate Program Director, Professor Stephen DeBacker would be more than happy to hear their stories via e-mail to lsa-math-updir@umich.edu.

The trend of reduction in funding from the National Science Foundation and other federal agencies supporting mathematics continues unabated, and it is an ongoing problem that there is lower availability of funds for inviting visitors, for helping graduate students attend conferences and workshops, and for many other valuable academic activities. While the University, College, and department have handled the troubling economic conditions as well as possible, I must repeat that "The help of those who have supported the department financially in these difficult times has never been more important." I cannot emphasize too much the appreciation that my colleagues and I feel for the generosity of those who have made contributions that are enabling the department to flourish in this problematic period of economic stress.

Wilfred Kincaid
1918-2015

Wilfred Macdonald Kincaid, born Friday, September 13, 1918, died Saturday, December 12, 2015 after a brief illness at age 97. Born in Cornhill, Scotland, his parents later settled in Berkeley, California, where Wilfred was educated in public schools. Upon his high school graduation, he remained in Berkeley while attending University of California, class of 1940, as a mathematics major. He pursued graduate studies at Brown University, where he completed his Ph.D. in applied mathematics.

Wilfred's employment career began in Hampton, Virginia, at a government agency which grew into NASA. He achieved veteran status there as WWII proceeded. After WWII service as a commissioned 2nd Lieutenant, US Army, he relocated to Ann Arbor, 1946, for an instructor's position at the University of Michigan Mathematics Department. Wilfred continued his UM career as a professor of Mathematics until his retirement in 1984.

In the fall of 1950, Wilfred made the momentous decision to join the graduate outing club at the UM. He met a schoolteacher working on a doctorate in education named Fay Allen and he did not let her get away. Wilfred and Fay were married in 1952. That union gifted him with three sons, William Allen Kincaid, of Ann Arbor; Walter James Kincaid, of San Jose, California (predeceased), and David Andrew Kincaid, of Ypsilanti. Fay Allen, his wife, preceded him in death in 2004. Other survivors include Deborah Gibson, formerly of Cedar Rapids, Iowa, affianced to William Allen Kincaid.

Wilfred pursued many interests in his long post-academic career. Within the First United Methodist Church, he was a devoted founder and participant in their Memorial Garden. He was also a loyal and lively contributor to their weekly Current Events discussions until his recent illness. He kept his AADL card busy by checking out very up-to-date books. In recent years he was an active member of the local chapter of the Osher Lifelong Learning Institute (OLLI) attending (and even teaching) lecture series and classes. Other interests included the study of anomalies as an ardent advocate of the Society for Scientific Exploration. He also maintained membership in the American Academy of Mathematics. His family and many others will miss him. Memorial gifts can be sent to the church or to the University of Michigan Mathematics Department.

Maxwell Reade
1916-2016

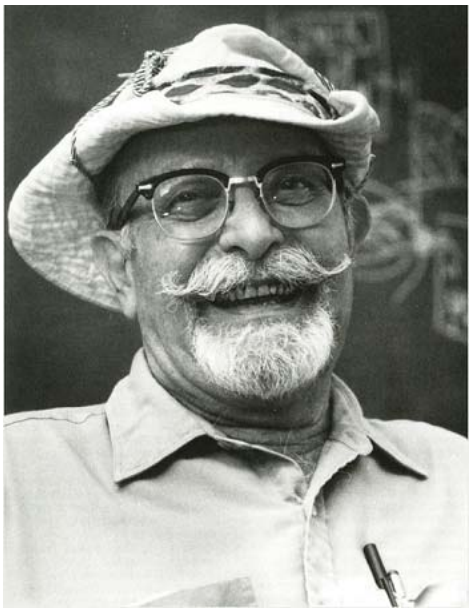
After 100 years and two days, Professor Emeritus Maxwell O. Reade passed away on April 13, 2016.

He met his goal of living to 100, and he led a remarkable life. The son of Hungarian immigrants, Reade was born in Philadelphia, and later moved with his family to Brooklyn, where he finished high school and attended Brooklyn College, graduating in 1936. He entered the math graduate program at Harvard on tuition scholarship, then went to Rice University on full scholarship to get his Ph.D. in 1940.

Reade was a professor of mathematics at the University of Michigan for 40 years, specializing in Complex Analysis, published 83 papers and was awarded the AMOCO Good Teaching Award in 1983. In World War II, he worked for the Applied Mathematics Panel of the Office of Scientific Research and Development and his applications of mathematics to the Allied war effort saved thousands of lives.

As associate chairman for mathematics graduate students for over seven years in the late 1960s and early 1970s, Reade was both a vigorous recruiter of quality students and a tireless worker on their behalf once they were here. He was ahead of his time in recognizing the importance of seeking and nurturing minority students. Reade ardently supported scholarships and grants for students, traveling to historically black colleges in the South and recruiting students for scholarships—more than 50 Ph.D.s were awarded to minority students he recruited—as well as foreign students. These trips afforded an opportunity to indulge in his passion for jazz, and he interviewed many musicians while amassing a large collection of jazz records.

As chairman of the LSA Scholarship committee from 1974 to 1994, Reade continued to help countless students pursue a college education who would not have otherwise had the means. He found and recruited talented students in all disciplines and was instrumental in establishing the Dean's Merit Scholarships in LSA. He had the ability to seek and find extremely bright students, particularly in mathematics, and convince them that Michigan was the right choice for their education. Reade was especially effective in assuring the mothers that their children would succeed here. His warmth, humor and passion for UM became the deciding factor for many to choose UM.



Reade was predeceased by his wife Marjorie and his former wife Isabel. He is survived by children Michael, Tim (Joy) and Alison Diver, and Lawrence Dolph (Lynn Nybell); grandchildren Fran (Ben Rosenberg), Chris, Wes Diver, Christine Dolph (Brian Wachutka) and John Dolph; great-granddaughter Winona Marjorie Wachutka; nieces Pam Schwarzmann (Ken Fink), Karen Schwarzmann (Larry Rosen) and Ann Schwarzmann (Greg Haagenson); nephews Tom Schwarzmann (Lisa Byle) and Tim Schwarzmann; grand nephew Peter Griess (Tiffany Reese); and great-grand nephew Ryder Griess.

Reade was known for his sense of humor, devotion to causes supporting the "little guy," intolerance of social injustice, making paw paw jam and writing letters to the editor published in the New York Times and Ann Arbor News. His final gift to education was to donate his brain to a longitudinal study at the UM Brain Bank.

Memorial contributions may be made to the Marjorie & Maxwell Reade Fund for Student Support (#796403), U-M Department of Mathematics, 530 Church St., Ann Arbor, MI 48109-1043 or online at www.giving.umich.edu.

Michigan Reception at the 2017 Joint Meetings

The University of Michigan Mathematics Alumni and Friends Reception at the 2017 Joint Mathematics Meetings in Atlanta will take place on

Thursday, January 5, 2017, 5:30 pm to 7:30 pm,

in the Vinings Room of the Hyatt Regency

Please RSVP to math.mich@umich.edu.

All are welcome!

2016 Graduate Program Fellowships & Awards

A. W. Flint Memorial Scholarship
Feng Zhu

Alice Webber Glover in Math Scholarship
John Holler
Daniel Irvine
Patrick Lenning
Xiaoyang Li
Robert Lutz

Barbour Scholarship
Wei Li

Cameron & John Courtney Scholarship
Andrew Melfi
Jiah Song

Edwin Wilkinson Miller Scholarship
Kwun Chung

Gabrielle & Sophie Rainich Fellowship
Michael Lewis

Juha Heinonen Memorial Graduate Fellowship
Han Huang

Luther Claborn Mathematics Scholarship
Bingying Lu

Marjorie Lee Browne Scholars
Jay Baraza
Adrian Carballeira
Anthony Della Pella
Jonathan Guzman
Derick Sund

Mathematics Alumni/ Alumnae Scholarship
Gilad Pagi

Mathematics Department Graduate Fellowship
Siddhant Agrawal
Daniel Barter
Ruian Chen
Yiwang Chen
Gilyoung Cheong
William Clark
Laura Du
Drew Ellingson
Roman Gayduk
Alexandros Georgakopoulos
Montek Gill
Jia Buo
Fanchen He
Yifeng Huang
Trevor Hyde
Grace Ingermanson
Zhan Jiang
Joseph Kraisler
Yuchen Liao
Devlin Mallory
Jules Metcalf-Burton
Rongxiao Mi
Alexander Munk
Takumi Murayama
Andrew O'Desky
Matthew Olson
Samantha Pinella
Huajie Qian
Ashwath Rabindranath
Elizaveta Rebrova
Emanuel Reinecke
Scott Rich
David Richman
Ryan Sandberg
Punya Satpathy
Salman Siddiqi
Rebecca Sodervick
Qingtang Su
Yitong Sun
Philip Tosteson
Alexander Vargo
Umang Varma
Nathanial Vaughn
Robert Walker
Ningyuan Wang
Feng Wei
Yun Wei
Derek Wood
Hao Wu
Farrah Yhee
Alexander Zaitzeff
Ming Zhang
Hai Zhu

Mathematics Scholarship Fund
Mark Greenfield

National Physical Science Consortium Fellowship
Christopher Fraser

Natural Sciences and Engineering Research Council Fellowship
Jeremy Hoskins

National Defense Science and Engineering Graduate Fellowship
Leighton Wilson

National Science Foundation Fellow
Amanda Bower
Amy Nesky
Suchandan Pal
Rebecca Rebhuhn-Glanz
Robert Silversmith
Olivia Walch
Rachel Webb

Peter Smereka Applied Mathematics Thesis Award
Daniel DeWoskin

Prasad Family Fund Fellowship
Audra McMillan

Proquest Distinguished Dissertation Award
Brandon Seward

Rackham International Fellowship
Rankeya Datta

Rackham One-Term Dissertation Fellows
Daniel Barter
Corey Everlove
Matthew Jacobs
Andrew Schaug
Jiah Song

Rackham Outstanding GSI Award
Brandon Carter

Rackham Predoctoral Fellowship
John Wiltshire-Gordon
Jeremy Hoskins
Jake Levinson

Rackham Science Award
Raymundo Navarrete
Eamon Quinlan

The Math Graduate Student Soccer team won the intramural championship.

Rackham Sokol Fellowship

Yuanyuan Chen
Jacob Haley
Michael Newman
Wei Li
Jasmine Powell
Yan Shuo Tan
Bowei Wu

Research Training Grant (RTG) – Algebra

Harold Blum
Brandon Carter
Charlotte Chan
Dondi Ellis
Gabriel Frieden
Stefan Froehlich
Patricia Klein
Alexander Leaf
Rohini Ramadas

Research Training Grant (RTG) – Geometry

Dondi Ellis
John Kilgore
Gene Kopp
Rohini Ramadas
David Renardy

Sumner B. Myers Memorial Prize

Brandon Seward

The Department of Mathematics Outstanding Teaching Award

Harold Blum

The Karen Rhea Excellence in Teaching Award

Alexander Leaf

The Mort Brown Excellence in Teaching Award

Alexandros Georgakopoulos

The Pat Shure Excellence in Teaching Award

Robert Lutz

The Wirt & Mary Cornwell Prize in Mathematics

John Wiltshire-Gordon

2016 Doctorate Degrees

Christopher Fraser completed the dissertation "*Correspondences Between Cluster Structures*" under the direction of Sijue Wu. He is a postdoc assistant professor at Indiana University-Purdue University Indianapolis.

Rachel Karpman completed the dissertation "*Total Positivity and Network Parametrizations: From Type A to Type C*" under the direction of Thomas Lam. Rachel is a visiting assistant professor at The Ohio State University.

Adam Kaye completed the dissertation "*Arithmetic of the Asai L-function for Hilbert Modular Forms*" under the direction of Kartik Prasanna. He will be an associate at Goldman Sachs.

Jiaqi Li completed the dissertation "*Applications of Stochastic Perron's Method and a New Result on Mean Field Games*" under the direction of Erhan Bayraktar. Jiaqi is an associate at Goldman Sachs.

Wei Li completed the dissertation "*Nonlinear Wave Propagation in Deterministic and Stochastic Media*" under the direction of Liliana Borcea. Wei is a postdoc at IMA at the University of Minnesota.

Gary Marple completed the dissertation "*Fast, High-order Algorithms for Simulating Vesicle Flows Through Constrained Geometries*" under the direction of Shravan Veerapaneni. He is a postdoc at the University of Michigan.

Suchandan Pal completed the dissertation "*An Explicit Jacquet-Langlands Correspondence*" under the direction of Kartik Prasanna.

David Prigge completed the dissertation "*Absorbing Boundary Conditions and Numerical Methods for the 2-D Linearized Water Wave Equations*" under the direction of Smadar Karni.

Seyed Hamed Razavi compelted the dissertation "*Symmetric Hybrid Systems: Periodic Gait Design for Legged Robots*" under the direction of Anthony Bloch. Seyed is a postdoc at EPFL in Switzerland.

Rebecca Rebhuhn-Glanz completed the dissertation "*Closure Operations that Induce Big Cohen-Macaulay Modules and Algebras, and Classification of Singularities*" under the direction of Mel Hochster. She is a P.T. Church postdoc at Syracuse University.

David Renardy completed the dissertation "*Bumping in Deformation Spaces of Hyperbolic 3-manifolds with Compressible Boundary*" under the direction of Dick Canary.

Gregory Simon completed the dissertation "*Automorphism-Invariant Integral Forms in Griess Algebras*" under the direction of Robert Griess.

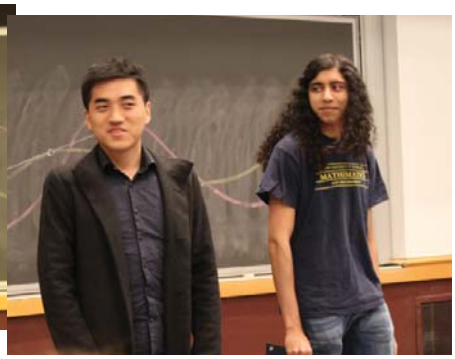
Andre Souza completed the dissertation "*An Optimal Control Approach to Bounding Transport Properties of Thermal Convection*" under the direction of Divakar Viswanath. Andre is a visiting assistant professor at Georgia Tech.

Olivia Walch completed the dissertation "*Exploring Subconscious Vision and Circadian Rhythms through Mathematical Modeling*" under the direction of Daniel Forger. Olivia is a research fellow at the University of Michigan.

John Wiltshire-Gordon completed the dissertation "*Representation Theory of Combinatorial Categories*" under the direction of David Speyer. He is a Van Vleck visiting assistant professor at the University of Wisconsin.

Awards Ceremony & Graduation Reception

First row l-r: Outstandting Graduating Seniors Karl Winsor, Yichuan Wang, Bar Roytman, and Joseph Richey; Professor Sarah Koch presents the LeVeque Award in Number Theory to Gwyneth Moreland. Second Row l-r: Roger Natarajan presents the Wolfson Award to Vicki Lu; Chip Levy presents the Lois Zook Levy Award to Michael Chrzan; Math Competition winners Pengbo Zhang and Mayank Patke. Third row l-r: Proessor Mel Hochster, Ph.D. recipient Oliva Walch, and Professor Stephen DeBacker; Michigan Mathematics Merit Scholars Heather Price, Jonathon Haefner, Nishant Gupta, and Benjamin Brady. Fourth row l-r: Happy graduates Xinhang Li, Yiling Yang, and Yang Liu; Professor Mel Hochster with Ph.D. recipient Suchandan Pal; Ph.D. recipient Andre Souza.



2016 Undergraduate Awards

Putnam Competition

The department's team for this year's William Lowell Putnam Competition placed 32nd out of 447 teams. The members of the team were **Hai Tran Bach**, **Qinzhong Liang**, and **Joseph Richey**. In the individual competition, **Joseph Richey**, **Samuel Tenka**, and **Alan Xu** finished in the top 300 out of more than 4200 students.

In the 33rd Annual University of Michigan Undergraduate Mathematics Competition there was a three-way tie for first place between **Hai Tran Bach, Mayank Patke**, and **Pengbo Zhang.**

Evelyn O. Bychinsky Awards

recognizing underclass students who show exceptional promise in mathematics:

Louisa Abbott
Noah Chen
Zitong Cheng
Zhongren Gao
Han Wu
Yifan Wu
Pengbo Zhang
Shangnan Zhou

Leon P. Zukowski Prize

recognizing outstanding service in the Mathematics Learning Center:

Brian Fagel

Mathematics Alumni/Alumnae Scholarship

Gwyneth Moreland

Wilfred Kaplan Award in Applied Mathematics

Matthew Bauerle

William LeVeque Award in Number Theory

Gwyenth Moreland

Jack McLaughlin Award in Algebra

Carsten Sprunger

Frank Raymond Award in Geometry and Topology

Robert Rose

George Piranian Excellend in Mathematical Writing Award

Stella Gastineau

Sumner B. Myers Award in Analysis

Han Wu

Marilyn and Stewart Gloyer Award

Sarah Stecher

Outstanding Achievement in Mathematics Awards

Benjamin Branman
Guanting Chen
Dichuan Dai
Jian Huang
Max Hully
Nikita Karpov
Christopher Lanctot
Steve Lin
Joseph Palen
Steven Sikora
Ji Sun
Yao Xiao
Lejing Xu
Gong Shun Yin
Yinyu Zhang

CIGNA Award

Dylan Pavliv

Irving Wolfson Award

Vicki Lu

Lois Zook Levy Award

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

Michael Chrzan

Michigan Mathematics Merit Scholar

Benjamin Brady
Nishant Gupta
Jonathon Haefner
Heather Price

Margaret S. Huntington Awards

Sophia Cotignola
Jenna Endsley
Meitong Hu
Kyle Koshiyama
Hermione (Xinlu) Li
Joshua Moss
Jeffrey Ohl
David Talbot
Rahil Ukani
Maxwell Weide

Outstanding Graduating Seniors

Joseph Richey
Bar Roytman
Yichuan Wang
Karl Winsor

Wirt and Mary Cornwell Prize in Mathematics

Carsten Sprunger

Churchill Scholarship (National Award)

Karl Winsor

A lively ping pong match takes place in the Math Department Atrium.

Actuarial Program Highlights

In September, 2016 we held our annual Actuarial Alumni/ae Leadership Council (AALC) meeting. A few weeks later one of the AALC participants commented: "The faculty presentations were excellent, informative, and showed the commitment to students and creativity that we have come to expect. But what was most impressive were the two student presentations that showed a level of resourcefulness and responsibility that were remarkable. Those of us on the AALC broke into spontaneous applause after each of those presentations."

In an effort to enhance the educational and professional opportunities for our actuarial students, we are taking significant efforts to strengthen our relationship with the Ross School of Business. Students who are majoring in Actuarial Math or Financial Math are being encouraged to consider adding a Business major or minor to their degree to add a significant competitive edge in the industry. I am extremely pleased that there are at least fourteen students who are either majoring or minoring in Business in addition to majoring in Actuarial/Financial Math. Also, we are encouraging students who are majoring in Business to consider adding a Math minor (with special emphasis in Actuarial/Financial Math). These efforts are noticed and welcomed by the employers recruiting our students.

Nothing gives me more pleasure than when a freshmen student comes to my office during his/her very first semester and says "Professor, I would like to declare Actuarial Math as my major and I want to pass Exam P (Probability) during my freshmen year." Well, this year there are about 10 such freshmen students who have made a commitment to major in actuarial math and to take actuarial Exam P during their freshman summer.

Many employers have expressed interest in visiting our campus to recruit our bright actuarial students. Also, employers are making offers earlier to some of our best students. This put many of our students in a delicate situation of having to make employment decisions even before they had a chance to interview with other employers. Hence, on October, 2016, we held our very first Actuarial Career Fair in close cooperation with the UM Career Center. Sixteen employers and more than 100 actuarial students took advantage of this historical event. This event was open to all the actuarial students attending any school within the state of Michigan. Of course, the actuarial profession was still strongly represented at the Mathematics Department Career Conference in November, 2016.

In May, 2016, we held the Fourteenth Annual Actuarial Commencement Luncheon, which is a high point of the academic year. There were over 150 people in attendance at the Nesbitt/Huntington Commencement Luncheon, including graduating seniors, their families, and the faculty. We celebrated the graduates' accomplishments with a catered lunch. Our keynote speaker this year was Walter S. Rugland, FSA, a distinguished 1961 graduate of UM, and is a long-serving member of our Actuarial Alumni/ae Leadership Council. He served as the President of the Society of Actuaries (1992-93) and as the President of International Actuarial Association (1997-98). Professor Nesbitt directed the Actuarial Program when Mr. Rugland was an actuarial student. Mr. Rugland and Professor Huntington served on many actuarial committees together.

In addition to the Student Actuaries at Michigan (SAM) student club, another student-run club, MFAMS (Michigan Finance and Mathematics Society) was formed last year. Close to 100 students majoring in Financial Math attended the most recent MFAMS mass meeting. There are more than 350 students on the e-mail list. It is impressive that this young club has already established relationships with close to twenty employers. For more information about MFAMS, please visit: https://maizepages.umich.edu/organization/MFAMS

Please consider joining the LinkedIn group University of Michigan Actuaries as a way to network and keep in touch with fellow alumni/ae. Also, you can update your University of Michigan directory information at https://leadersandbest.umich.edu/alumni_update/

This communication is just to highlight some of the activities that are taking place at your alma mater. I plan to send separate detailed description on each one of the important events in the future. We would love to hear from you if you have comments, questions, or suggestions. And if your travels bring you to Ann Arbor, please pay us a visit in East Hall.

B. Roger Natarajan, PhD, FSA
Actuarial Program Director

SAM members at a paintball outing.

Alumni Updates

P.C. Larsen Burkard (B.A. 1963) keeps busy teaching her grandchildren and young cousins to count, and she works on cubic and quartic eauations, keeping Henrik Abel in mind.

Harold P. Benson (B.S. 1971) continued his studies at Northwestern University, earning a Ph.D. in Industrial Engineering and Management Sciences in 1976. In 1979 he began his academic career at the University of Florida, and in 2010 achieved the named rank of American Economic Institutions Professor of Information Systems and Operations Management. During his career, his research involved multiple objective and nonconvex optimization. He taught a variety of management science and operations management courses, and received several awards and recognition for his research and teaching. He retired in 2013 as professor emeritus.

Donald H. Rhoads (Ph.D. 1968) studied under H. Arlen Brown and Carl Pearcy at UM. He retired in 2006 from Andrews University, where he had chaired the Mathematics Department for six years previously. He recently published a book entitled *Euclidean Geometry and it Subgeometries* with coauthors Calkins, Jones, and Specht.

Mark Troutman (B.S. 1975) is president of Summit Reinsurance Services in Indiana.

Eleana Pleskacz Schauer (B.S. 1974) was an IT management consultant for IBM Corporation from 1974 until her retirement in 2001. She remembers all of her math professors, in particular Professor Kincaid. She is pictured here on her graduation day.

Eugen Mihailescu (Ph.D. 1999) studied under J.E. Fornaess. He is currently a full Professor at the Institute of Mathematics of the Romanian Academy, in Bucharest, Romania. In the years after UM, he held visiting appointments at Institut des Hautes Etudes Scientifiques (IHES), Bures-sur-Yvette, France; Texas A&M University; University of North Texas; University of Bremen, Germany; Max Planck Institut fuer Mathematik, Bonn, Germany; Instituto de Matematica Pura e Aplicada, Brazil; Humboldt University, Berlin, Germany.

Hengkai (Alex) Chen (B.S. 2012) graduated in applied math, and moved to Hong Kong in 2013 after spending some time in a boutique hedge fund in Boston. He joined the Royal Bank of Scotland in its Debt Capital Markets team mainly focused on fixed income product origination in the greater China region. In April 2015, following RBS's unfortunate global retreat from investment banking business, he moved to Goldman Sachs in the same team assuming the same role in Debt Capital Markets origination. He was promoted to associate in January 2016, and is pursuing a career in investment banking. He enjoys visiting the UM campus each time he returns to the United States.

Ka-Yiu (Brian) Lee (B.S. 2012) dual majored in economics. He has a position with BlackRock Asset Management in Hong Kong.

Frances Korsal (B.S. 2014) is a business systems analyst with the University of Michigan Office of Development.

Want Your Own Math T-Shirt?

Here is your chance to represent the Math Department in the stylish shirts highlighted on the next two pages. Complete the order form below by placing a number (signifying the quantity desired) in the appropriate boxes (sizes are standard adult), complete your address information, and return to the address at right along with your check or money order (payable to the Department of Mathematics). T-shirts are $9 each, shipping and handling is included.

	Blue	Gray	Yellow	Pink
Small				
Medium				
Large				
X-Large				

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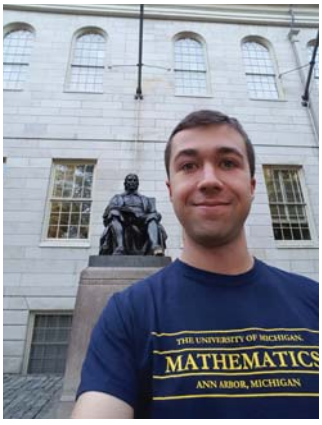
The University of Michigan
Department of Mathematics
Undergraduate Office
530 Church Street
2084 East Hall
Ann Arbor, MI 48109-1043

Where's Your Math T-shirt Been?

This page, top row l-r: Nicholas Triantafillou (2013) at MIT; Mitya Boyarchenko at the Alamo. Second row l-r: Kevin Poenisch (2012) in Lubeck, Germany; Max Kontorovich, Eric Winsor, and Amanda Burcroff in Athens, Greece; Paul Kessenich and his son with his prize from Cedar Pointe. Third row, l-r: Michelle Gurevich (2018) at the Bolshoi Theatre, Moscow; Michael Bennett (2012) and his daughter in her math onesie; Steven Miller and his daughter ready to run.

Opposite page, top row l-r: Aditya Badrinath (2013) at DESCO; Ben Brady at Yosemite; Kristin Dona (2018) in Brighton, Australia; Jessica Thompson (2017) in Munich. Second row l-r: Kristen Amman (2017) at Mt. Rushmore; Donald Davenport (1965) at the Vatican; Jessica Fintzen flips at Harvard. Third row, l-r: Christina Schaffran (1971) at Isle Royale National Park, Michigan; Connor Thompson in Iceland; Voon Seng Lai (2009) at the Langjokull Glacier, Iceland. Fourth row, l-r: James Lawniczak (2016) in Cambridge; Juan Mesa (2018) and friend in Glucksburg, Germany; Angela Kubena with the UM stormtrooper.

Where's Your Math T-shirt Been?



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We'd like to hear from you! Please complete and return this form for our alumni/ae files. You may mail it to the address above, fax it to 734-763-0937, or email the information to math.mich@umich.edu. See lsa.umich.edu/math/alumni-friends.

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University of Michigan Degree(s) with years & advisors_____

Degrees from other Universities/Years_____

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Home Phone_____E-mail_____

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