



Message from the Department Head



Hello! I hope that you are staying healthy! We've all gone through an unusual pandemic year.

In 2020-21, Purdue provided masks, face shields, hand sanitizers, regular and surveillance testing for COVID-19, rooms for quarantine, weekly

tips for well-being... Classrooms were at diminished capacity to enable physical distancing of at least six feet. Attendance in classes was optional, class activities were recorded for absent students, many classes were completely online. In the fall semester some face-to-face classes rotated student attendance, and in the spring, we increased the number of face-to-face classes and moved them into larger classrooms. Most office hours were online, and the Math Resource Room switched to various online forums; the advantage of online forums is that anybody can post an answer at any time and that answers remain visible to those who come later. Our faculty and teaching assistants worked hard to adapt their class meetings for the online and hybrid activities, to respond to email and forum queries, to write different exams, to accommodate students in quarantine. What was missing, of course, were the live interactions that add so much to learning

We have much to celebrate. Twenty-four of our graduate students finished with a Ph.D., five with Master's degree, and 192 with the Bachelor of Science degree (this counts both

mathematics and actuarial science majors). This fall we will have 21 new graduate students, for a total of 137.

In the coming year we will have a new undergraduate major within the department: we now join the Computer Science and Statistics department to offer a data science major. New courses were developed by Professors Mimi Boutin, Guang Lin and Jon Peterson.

Purdue came out of 2020-21 strong: we had no infections in any classrooms or labs, and our incoming class of more than 10,000 new students is larger than ever, giving us a huge vote of confidence. Most of the incoming students are in engineering and STEM disciplines, which means that we will be running even more mathematics classes. This summer we hired five new continuing lecturers; these are permanent non-tenured positions for teaching our heavily enrolled 100- and 200-level courses. Permanency allows us to offer consistent high-quality instruction for years to come.

In the spring we hired three new tenure-track professors, two professors of practice and six Golomb Visiting Assistant Professors. This fall we are switching to pre-pandemic classroom density and modes of classroom instruction, while wearing masks and sanitizing our spaces. The goal is still excellence of instruction, plus staying safe. You stay safe as well!

Irena Swanson
Professor and Head

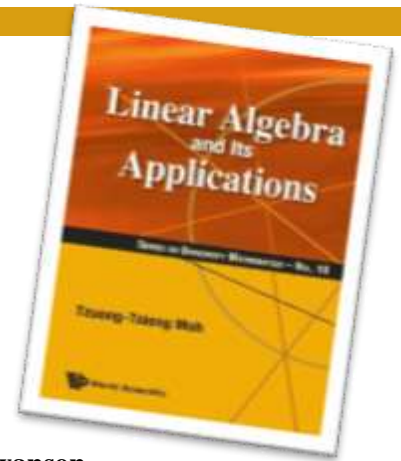
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Highlights Book Publishings

Professor Emeritus Tzuong-Tsieng Moh recently published a new book entitled *Linear Algebra and its Applications* with World Scientific Publishing. This book was released in November 2020. More information of this book can be found [here](#).



Professor and Department Head, Irena Swanson, has a new book entitled *Introduction to Analysis with Complex Numbers* with World Scientific Publishing, released in March 2021. Her book covers the standard topics in introductory analysis and, that in addition constructs the natural, rational, real and complex numbers, and also handles complex-valued functions, sequences, and series. The book teaches how to write proofs and Fundamental proof-writing logic. The book provides many examples of proofs with words in a different font for what should be going on in the proof writer's head.

The book provides many examples and exercises to solidify the understanding and exercises are varied, many involve proofs, and some provide additional learning materials. More information of this book can be found [here](#).



2021 SIAM CSE Best Paper Prize

2021 SIAM CSE Best Paper Prize (SIAM Activity Group on Computational Science and Engineering Best Paper Prize) awarded to **Professor Jianlin Xia** and collaborators.

The SIAG/CSE Best Paper Prize is awarded to James Vogel, Jianlin Xia, Stephen Cauley, and Venkataramanan Balakrishnan "for impressive work which reduces the computational complexity of an eigendecomposition of Hermitian matrices from cubic to log-squared linear by utilizing the hierarchical semi-separable structure."

Jianlin Xia is a professor in the Department of Mathematics, with a courtesy appointment in the Department of Computer Science. He received his PhD in Applied Mathematics at UC Berkeley. His research interests lie in numerical linear algebra and numerical analysis. The current focus of his work is on structured matrices, fast solvers, randomized methods, and their connections to broader numerical problems. He was named a University Faculty Scholar in 2018 and received an NSF CAREER Award in 2013. He currently serves on the editorial boards of multiple numerical analysis journals.

More information is available from the recent SIAM News Prize Spotlight and the prize page:

<https://sinews.siam.org/Details-Page/february-2021-prize-spotlight#James%20Vogel%20and%20others>

<https://www.siam.org/prizes-recognition/activity-group-prizes/detail/siag-cse-best-paper-prize>

New Assistant Professors Fall 2021

Dr. Yuan Gao joined the Department of Mathematics as a tenure-track assistant professor in August 2021. She was a William W. Elliott Assistant Research Professor at the Department of Mathematics, Duke University during 2019-2021. Before joining Duke, she received her PhD from Fudan University in 2017 and her thesis received the Silver Award of New World Mathematics Awards. In 2017-2018, she was a Postdoc at Hong Kong University of Science and Technology.

Yuan Gao specializes in calculus of variation and numerical analysis for singular nonlinear PDEs arising from crystalline materials, image sciences and fluid dynamics. She also works on applied stochastic analysis and algorithms for multiscale dynamics and optimal control for the transition path theory in biochemical reactions.



Dr. Matthew Jacobs will join the Department of Mathematics as a new tenure-track assistant professor in January 2022. He received his Ph.D. in mathematics in 2017 from the University of Michigan under the supervision of Selim Esedoglu. From 2017-2021 he was an assistant adjunct professor at UCLA. He is spending Fall 2021 at the Simons Institute as a Simons Fellow.

His research interests lie at the intersection of the calculus of variations, partial differential equations, and numerical optimization. He specializes in using variational techniques to study PDEs that arise from physical and data science. Matt enjoys straddling the fence between pure and applied math, both proving theoretical results and developing efficient numerical algorithms.

Matt Jacobs is excited to join Purdue, and is looking forward to stimulating conversations with students and faculty.

Dr. Alexandria (Al) Volkening joined the Department of Mathematics (and the Weldon School of Biomedical Engineering, by courtesy) as a tenure-track assistant professor in August 2021. Prior to that, she was an NSF-Simons Fellow at Northwestern University, and prior to that, a postdoctoral fellow in the Mathematical Biosciences Institute at Ohio State University. She completed her Ph.D. in applied math with Bjorn Sandstede at Brown University in 2017, and received her B.S. in math from the University of Maryland, Baltimore County in 2011.

With an application-driven perspective and a background in dynamical systems, Al Volkening combines predictive modeling and analysis to better understand self-organization and emergent behavior in diverse areas, including animal-skin patterns, election dynamics, and pedestrian movement. She's looking forward to becoming a part of the Purdue community and developing new collaborations in complex systems.



Dr. Di Qi joined the Department of Mathematics as a new tenure-track assistant professor in August 2021. Dr. Qi received his Bachelor's degree in Mathematics and Physics from Shanghai Jiao Tong University in 2012. Then he went to the Courant Institute of Mathematical Sciences at New York University for graduate studies, and obtained a Ph.D. in Mathematics in 2017 advised by Andrew Majda. Afterwards, he continued to serve as a postdoctoral fellow at the Courant Institute from 2018 to 2021.

Di Qi's research concerns uncertainty quantification and statistical modeling of complex dynamical systems, including the development of computational methods and theories using mathematical tools, data analysis strategies and machine learning. He is working on several research directions in general mathematical theories and applicable algorithmic methodologies to address problems from realistic natural processes such as geophysical and plasma flows. He is very excited to join the Purdue community and discuss mathematics and other topics with the students and faculty.



Dr. Haibo Liu, will join the Departments of Statistics and Mathematics as a new tenure-track assistant professor of actuarial science in August 2021. He earned his B.Sc. degree in 2013 and M.Phil degree in 2015, both from the University of Hong Kong, and earned his Ph.D. degree in 2019 from University of Iowa under the supervision of Qihe Tang and Ambrose Lo. He has been a Senior Research Associate in the School of Risk and Actuarial Studies at UNSW Sydney since 2019. He is a Fellow of the Society of Actuaries.

Haibo Liu's current research interests include pricing in incomplete markets, insurance-linked securities, and insolvency risk. He is keen to build up collaboration with new colleagues and see new students at Purdue.

Professors of Practice

Dr. Philip Mummert transitioned to the Associate Professor of Practice from the role of the Assistant Head, the role he's had in the department since 2015. He received his Ph.D. in Mathematics in 2007 from Purdue University under the direction of Gregory Buzzard and John Smillie (Cornell University). He has previously taught at Cornell University, Taylor University, and Butler University. He received the Ruth and Joel Spira Teaching Award in 2019, the College of Science Professional Achievement Award in 2017, and he was named an Associate Fellow of the Purdue Teaching Academy in 2006.

His research interests focus on discrete dynamical systems in several complex variables.



Dr. Kaitlyn Hood moved into an Assistant Professor of Practice position beginning in August 2021. She received a Bachelor's degree in Mathematics and Physics from University of Maryland in 2010. She was an NSF Graduate Research Fellow at University of California Los Angeles, where she obtained her Ph.D. in Applied Mathematics in 2016 under the direction of Marcus Roper. From 2016 to 2019, she was an NSF Mathematical Sciences Postdoctoral Research Fellow at MIT, after which she became a Visiting Assistant Professor at Purdue.

Kaitlyn Hood's research interests are in mathematical modeling for fluid mechanics. She is especially interested in modeling flows at moderate Reynolds numbers with applications to biology and bioengineering.



Dr. Andrey Glubokov moved into an Assistant Professor of Practice position beginning in August 2021. He received his Master's degree in Theoretical Physics in Moscow State University in 1992 and his Ph.D. in Mathematics from University of New Mexico in 2005. He has taught mathematics and statistics, including at Gustavus Adolphus College, Pennsylvania State University, Millersville University, Scripps College, Williams College, Florida Southwest State College, and most recently at Ave Maria University.

His main mathematical interests are in non-commutative geometry, mathematical physics, cluster algebras and Jones polynomials.



We also hired:

6 Golomb Visiting Assistant Professors: Arun Debray, Gene Kopp, Ying Liang, Chen Liu, Guang Yang, Farrah Yhee.
 4 (Continuing) Lecturers: Lara Du, Gayane Poghotanyan, Jill Shalabi, Ping Xu.
 Visiting Assistant Professors: Qing Cheng, Christian Moya Calderon, Christian Noack, Shiang Tang, Zecheng Zhang.

Awards and Honors

Tess Anderson Honored with 2021 Violet Haas Memorial Fellowship



Assistant Professor Theresa (Tess) Anderson is a mathematician and advocate, whose work in both areas centers around building new bridges. Her advocacy centers around underrepresented minorities, particularly people of color and women.

Tess Anderson's mathematics lies at the interface of harmonic analysis and analytic number theory, and is funded by a National Science Foundation grant jointly in the two (seemingly) separate areas of Analysis and Algebra, Number Theory and Combinatorics. In one instance, she uncovers number-theoretic structure in analysis related to a broad range of applications, such as X-rays and musical scales, but the dialogue between these fields goes both ways and in many directions. She is the 2006 Presidential Scholar from Wisconsin, and holds Bachelors degrees in Mathematics, Chemistry, and Spanish from the University of Wisconsin, and a Ph.D. in pure Mathematics from Brown University.

The award is named for Violet Haas, an electrical engineering professor at Purdue University from 1962 to 1986, who was instrumental in the early development of the Purdue chapter of the Society of Women Engineers. The fellowship is to support the science and engineering careers of junior female faculty with children.

Jay Akridge, provost and executive vice president for academic affairs and diversity, presented the award along with co-host Mangala Subramaniam, director of the Susan Bulkeley Butler Center for Leadership Excellence and professor of sociology virtually on March 9, 2021.

Jim McClure awarded 2021 Focus Award

Professor James (Jim) McClure is a Professor of Mathematics and Curriculum & Instruction. He has been with Purdue University since 1992, he has taught a wide variety of courses, and from 2014 until this summer he was the Associate Department Head. Over the years, he has worked closely with the Disability Resource Center to ensure that all students received the best education possible, constantly looking for unique ways to say "yes" to access when others would say "no." He has established an open and collaborative relationship with Purdue's Disability Resource Center. Through this relationship, he has continued to promote the philosophy that access is a shared responsibility at Purdue University.



When barriers arise to accessibility for students in mathematics, Jim McClure takes action to assist his students, and shares his ideas on how the university can work to reduce or eliminate those barriers. He looks for innovative and creative ways to support student access and participation, and he recognizes that effective student access can look different for each student.

Jim McClure continually goes above and beyond when it comes to providing access to students. He understands that the ADA is the foundation for accessibility, but not the ceiling. He has been invaluable in the process of converting typically highly visual subject matter into a medium that provides students wider access.



Manuel Rivera named 2021 Karen EDGE Fellow

Congratulations to Assistant Professor Manuel Rivera for being named the 2021 Karen EDGE Fellow. The selections are based on candidate's excellent research programs and plans to use the funds for enhancing those programs through collaboration and travel. The Karen EDGE Fellows for 2021 are Emille Davie Lawrence, University of San Francisco, and **Manuel Rivera, Purdue University**.

[The Karen EDGE Fellowship Program](#) was established with a generous gift from Karen Uhlenbeck on the occasion of her 2019 Abel Prize. The Fellowships are designed to support and enhance the research programs and collaborations of mid-career mathematicians who are members of an underrepresented minority group. The Karen EDGE Fellowship supports and enhances the research programs and collaborations of mid-career mathematicians with funds—\$8,000 per year for three years—to offset the cost of travel and supplies associated with a proposed research project.

Joe Chen receives award of Distinguished Faculty for Research

Congratulations to **Dr. Kuan-Hua (Joe) Chen** on receiving the award of Most Distinguished Faculty for Research by University Residences. The award is given annually to a faculty member whose research has influenced a student's passion within that field of study, and selections are based on nominations from students to recognize faculty for being especially successful in various learning initiatives. The heartfelt nominations made Joe Chen a unanimous choice for this award! The award said: "Your impact is widespread and so much appreciated especially in a year like this! Thank you for all you do."

[Joe's nomination link](#)



Guang Lin awarded a Trask Award

Professor Guang Lin was awarded \$50,000 for his project entitled "*MACHINE LEARNING DRIVEN CONTOURING SYSTEM FOR HIGH-FREQUENCY FOUR-DIMENSIONAL CARDIAC ULTRASOUND AND PHOTOACOUSTIC IMAGING*" From the Trask Innovation Fund to commercialize a machine learning system for cardiac ultrasound and photoacoustic imaging.

The Trask Innovation Fund awards funding to inventors who are prepared to move their innovations to market and is designed to advance the commercial potential of Purdue intellectual property through short-term research projects.

Trask Innovation Fund was established in 1974 by a gift from Verne A. Trask in memory of his wife, Ramoth Trask. The objective of Trask Innovation Fund is to support short-term projects that will enhance the commercial value of Purdue University intellectual property assets.



Instructors Appreciated as Educators

Appreciated Educators were acknowledged by Jay Akridge, Provost and Executive Vice President for Academic Affairs and Diversity on April 19, 2021.

The Provost's Office put out a general call to students inviting them to share any comments about instructors who truly made a difference for them at Purdue. Seven of the instructors in the Math Department received such statements through the Provost's office on how they are appreciated as educators!



Jeff Beckley



Brooke Max



Philip Mummert



Margaret Thomas



Kiril Datchev



Kenji Matsuki



Giovanni Granados

Phil Mummert receives Exceptional Teaching and Instructional Support During the COVID-19 Pandemic



Congratulations also to **Dr. Phil Mummert** for receiving the Exceptional Teaching and Instructional Support During the COVID-19 Pandemic award.

The award, given by Purdue Teaching Academy, was established to recognize exceptional effort in innovative, effective, and above all safe ways to teach our students during this pandemic year. As we all know, faculty and staff have worked tirelessly across the university to pivot to online learning, find new approaches to helping our students learn, and to support students materially and emotionally throughout these difficult months. Dr. Mummert's work as an instructor and mentor stands out as among the best of Purdue's efforts to deliver on our mission of a world-class education for all of our students.

2020-2021 Teaching for Tomorrow Fellowship Awards Recipients

Senior Fellow: Birgit Kaufmann

Research Area: Mathematical Physics, finite-size scaling in atomic models, non-equilibrium, quantum wire networks from triply-periodic minimal surfaces
Select Awards: Teaching for Tomorrow Award, Purdue University, 2011, 2020
 Ruth and Joel Spira Teaching Award
 2016 University Faculty Scholar Award
 NSF CAREER Award, 2013



Junior Fellow: Haizhao Yang



Research Area: Mathematics of machine learning and data science, applied and computational harmonic analysis, high-performance scientific computing, high-frequency wave propagation, inverse problem, signal and image processing.
Select Awards: Teaching for Tomorrow Award, Purdue University, 2020
 NSF CAREER Award, 2020
 AMS Simons Travel Award, 2015
 SIAM Early Career Travel Award, 2015

Provided by the classes of 1944 and 1945, the Teaching for Tomorrow (TfT) Fellowship Award fosters continued excellence in teaching and learning and facilitates the development of teaching potential. Each year the award recognizes up to 12 assistant professors (or recently promoted associate professors) for demonstrated talent for teaching, as well as three senior faculty members for long-term contributions to teaching and mentoring at the University.

The Department of Mathematics is highlighting mathematical art work by our Graduate Students

Graduate student Matthew Weaver used pine to create a digital image of the Whitney Umbrella, shown here. It is displayed on the 8th Floor of the Mathematical Science Building next to office 822. The Whitney Umbrella is a self-intersecting surface in affine space and is the classical example of a pinch-point singularity. Named after Hassler Whitney, this surface is often depicted with the negative z-axis serving as the “handle” of the umbrella.

Matthew goes on to say, as a “commutative algebraist, my research directs me to the study of the equations and algebraic structures associated to geometric varieties like the one shown here. However, one cannot help but appreciate the geometric nature of these objects. Details such as tangents, intersections, smoothness, etc. have their algebraic translations, but there is something intrinsically satisfying one only obtains from visualizing such an object or even using one’s imagination. For instance, my own research relates to the resolution of singularities using blowup algebras. If I were to resolve the singularities here along the z-axis, I would have to figure out how to “open up the umbrella”.



Mathematics Student wins NSF Graduate Research Fellowship

Garrett Mulcahy, class of 2021, won an NSF Graduate Research Fellowship.

Garrett is from Elmhurst, IL. He double majored in mathematics and statistics and hopes to become a research mathematician, either in academia or at a national laboratory.



Garrett will use the NSF Graduate Fellowship at the University of Washington pursuing a Ph.D. in mathematics (with an interest in analysis and probability). The Fellowship will allow Garrett to continue the research project he worked on with Professor Thomas Sinclair. The project goal is to use techniques from random matrix theory to better understand the connection between quantum expanders and a class of matrices we proposed called malnormal matrices.

“I would especially like to acknowledge how grateful I am for the support and mentoring of Dr. Thomas Sinclair, Dr. Mark Ward, and Dr. Steve Bell throughout the application process as well as my whole time at Purdue”.

National Science Foundation Graduate Research Fellowships Program (GRFP) recognizes and supports individuals early in their graduate training in Science, Technology, Engineering, and Mathematics (STEM) fields.



Barry Goldwater Scholarship Award Winner

Justin Copenhaver, a student in the College of Science was awarded a 2021 Barry Goldwater Scholarship. Copenhaver, from Russiaville, Ind., is a physics and mathematics dual major planning on obtaining a physics PhD focused on condensed matter theory and quantum information. He has worked with Professor Adam Wasserman from Chemistry and Professor Birgit Kaufmann from Mathematics/Physics. Currently, and is currently working with Professor Jukka Vayrynen in Physics.

Justin’s research for the Goldwater application was his work applying quantum annealers to problems in quantum chemistry. He is currently working on research on topological insulators and quantum transport, specifically how spin-symmetry breaking perturbations can affect spin transport in two-dimensional topological insulators like graphene. In the future he hopes to combine these research interests together to study how topics in condensed matter physics can be applied to the development of quantum computers.

In addition, another mathematics student, Ethan Brady, was also a Purdue University nominee.

The Barry Goldwater Scholarship and Excellence in Education Foundation was established by Congress in 1986 to serve as a living memorial to honor the lifetime work of Senator Barry Goldwater, who served his country for 56 years as a soldier and statesman, including 30 years in the U.S. Senate. The Foundation awards scholarships to college students who intend to pursue careers in science, mathematics, and engineering.

Goldwater Scholars have impressive academic and research credentials that have garnered the attention of prestigious post-graduate fellowship programs. Goldwater Scholars have been awarded 94 Rhodes Scholarships, 150 Marshall Scholarships, 170 Churchill Scholarships, 109 Hertz Fellowships, and numerous other distinguished awards like the National Science Foundation Graduate Research Fellowships.

More Information can be found: <https://goldwater.scholarsapply.org/>.

Department of Mathematics Awards

Every April the Department holds a reception to honor students earning scholarships and awards. This year's event was held virtually on April 22, 2021. The following students were recognized!



Congratulations to the following Students!!

MATHEMATICS AWARDS

Michael Golomb Math Award

Garrett Mulcahy

Eugene V. Schenkman Memorial Award

Juliet Aygun, Kevin LaMaster

Jerison Memorial Award in Analysis

Ethan Brady, Adam Clay

Glen E. Baxter Memorial Award

Joseph Veltri

Merrill E. Shanks Memorial Award

Nicole McDivitt, Camryn Adkison, Grant Doyle

Senior Achievement Award

Donald Adams, Riley Borgard, Xingyu Cheng, Kevin LaMaster, Garrett Mulcahy, Abhinav Sinha

College of Science Outstanding Senior

Zijie Zhou

College of Science Outstanding Junior

Jacob Rahn

College of Science Outstanding Sophomore

Ethan Brady

College of Science Outstanding Freshman

Adam Clay

MATHEMATICS SCHOLARSHIPS

Alton & Juanita S. Andrews

Madhuri Vempati, Daniel Lense, Darrell Fischer, Brian Morton, Yiyao Zhang

Thomas Arai Scholarship

Jacob Rahn

Leonard D. & Anna W. Berkovitz Scholarship

Juliet Aygun, Jacob Rahn

Mark Hoppy Memorial Scholarship

Ethan Brady

Virginia Mashin Scholarship

Han Truong, Michelle Dunn, Sofia Lalani

Arthur Rosenthal Scholarship

Richard Li, Arianna McNamara, Sterling Saint Rain, Ethan Brady

Jean Rubin Scholarship

Zhiyao Xu, Sujal Timilsina, Rthvik Raviprakash, Matthew Hwang

Helen Clark Wight Scholarship

Zachary Smith, Bradley Duda, Megan Hernly, Luis Haro Gonzalez, George Babus, Kristen Ferguson

Andris A. Zoltners Scholarship

Grace Bowling

Gerald R. MacLane Outstanding Undergraduate Memorial Award

Samantha DePoy

Gordon L. Walker Scholarship

Swagat Bhattacharyya, Gozde Iloglu

Craig Wilson Scholarship

Jacob Alge

GRADUATE AWARDS

Abhyankar Award for Algebraic Geometry
Harrison Wong

Abhyankar Award for Commutative Algebra
Vinh Nguyen

Excellence in Teaching TA Award
Leah Buck, Taylor Daniels, Nicholas Egbert, Matthew Weaver,
Harrison Wong

Certificate of Merit for TA Teaching
Alexander Hazeltine, Jay Iuliano

Excellence in Service TA Award
Alden Bradford



ACTUARIAL SCIENCE AWARDS AND SCHOLARSHIPS

Outstanding Freshman in Actuarial Science
Emma Hassfurther

Outstanding Sophomore in Actuarial Science
Samuel Muir

Outstanding Junior in Actuarial Science
Shobana Iyer

Outstanding Senior in Actuarial Science
Sarah McDanell

Northwestern Mutual Actuarial Science Service Award
Samantha Tugman

Milliman Awards
Seth Thompson, Kyle Stowe, Laura Hayes, Allyssa Timko, Kaitlyn Stangl, Jacob Barry

Milliman Diversity Award
Danielle Harrison

Swiss Re Awards
Samuel Chilson, Andrew George, William Bach, Eve Smith, Mitchell Gigli

Aegon Scholarship
Jacob Rahn

Christine Bell Heim Award
Lauren Sturges

Bill & Marilyn Chen Scholarship
Melissa Cai Shi

Actuarial Science Scholarship

Suyash Uppal	Elissa Haake	Zachary Smith	YuAn Michelle Wen
Jacob Avery	Luke Cooley	Owen Pierce	Christopher Choy
Qingyi Tan	Andrew Deuschle		



Faculty Promotions

Baiying Liu was promoted from Assistant Professor to Associate Professor effective Fall 2021. Professor Liu received his Ph.D. from the University of Minnesota. His research focuses on automorphic forms, L-functions, Langlands program, representation theory and number theory. Professor Liu is currently funded by an NSF Career Grant.



Jeremy Miller was promoted from Assistant Professor to Associate Professor effective Fall 2021. Professor Miller received a Ph.D. from Stanford University. His research interests are algebraic topology to various moduli spaces, configuration spaces, and classifying spaces. Professor Miller is currently funded by an AIM Square Grant and a Simons Foundation Collaboration Grant.



Linquan Ma was promoted from Assistant Professor to Associate Professor effective Fall 2021. Professor Ma received his Ph.D. from the University of Michigan. His research interests are commutative algebra and algebraic geometry. Professor Ma is currently funded by an NSF Grant.



Thomas Sinclair was promoted from Assistant Professor to Associate Professor effective Fall 2021. Professor Sinclair received his Ph.D. from the Vanderbilt University. His current research interests lie in von Neumann algebras, deformation/rigidity theory, geometric and measurable group theory, model theory of operator algebras. Dr. Sinclair earned the Ruth and Joel Spira Award for Excellence in Undergraduate Mentoring and Undergraduate Teaching in 2019-20.



Guang Lin was promoted from Associate Professor to Full Professor effective Fall 2021. Professor Lin received his Ph.D. from Brown University. His research interests are computational and predictive science and statistical learning both on algorithms and application. Professor Lin is currently funded by a John Deere Award and was also a University Faculty Scholar, 2019. In addition, Professor Lin serves as the Director for the Data Science Consulting Service.



Brooke Max was promoted to Senior Lecturer effective July 1, 2021. Dr. Max received her Ph.D. from Purdue University. Her focus is in mathematics education and curriculum and instruction. She was recently recognized as an Instructor Appreciated for Education by the Provost office.



Administration Changes

As faculty, staff and students adjusted to the new normal of this past year, the department's commitment to quality teaching, mentoring and resolving issues never wavered. This is due to the dedicated faculty who serve beyond just teaching to include administrative duties as part of their daily workload.



James (Jim) McClure has served as the Associate Department Head since 2014. He is a Professor of Mathematics and Curriculum & Instruction, earning his Ph.D. in Mathematics from the University of Chicago (1978). His research interest is in topology. He returned to his regular faculty role on July 1st. He is now in office 734. Many thanks to Professor McClure for his much appreciated administrative service!



Arshak Petrosyan, Professor of Mathematics, is the new Associate Department Head. He joined the department in 2003. He earned his Ph.D. from the Royal Institute of Technology, Stockholm in 2000, and his research interests are in partial differential equations and free boundary problems. His new office is 836.



Philip Mummert served in the role of Assistant Department Head and Schedule Deputy from 2015 until August 2021. This spring he accepted the position of Associate Professor of Practice in the department. He earned his Ph.D. in Mathematics from Purdue University in 2007. He remains in his office, 846.

Kuan-Hua (Joe) Chen is the new Assistant Department Head beginning July 2021. In his prior role he was the Graduate Teaching Program Administrator and Continuing Lecturer in the department. He was hired into that position in 2012 and has worked with graduate and undergraduate students teaching large, multi-section calculus courses in addition to coordinating of TAs. He earned his Ph.D. in Aerospace Engineering from Purdue University in 2010 as well as his Masters (2003) and Bachelor (2001) Degrees. He remains in his office, 848.



Math is the only place where truth and beauty mean the same thing.
 — *Danica McKellar*

Staff Changes

This past year saw several changes and adjustments for students, faculty and staff. COVID caused many to work remotely and learn to be successful in a new environment. The department staff made sure business went on as usual with limited disruptions or issues! KUDOS to all the staff!

With the new “normal” came reorganization to align better with the department’s needs and University changes. Beginning in the Fall 2021, our staff changes are as follows:

Stephanie Foster, Undergraduate Coordinator, moves from her second floor office to the sixth floor! Stephanie’s new office will be MATH 630. Stephanie will continue to work with students and faculty as well as ADA compliance.



Shannon Cassady remains on the sixth floor in MATH 632. Shannon continues to work as the Graduate Coordinator for the department.

Shu-fang Chang moves to the eighth floor and will be located (for the time being) in MATH 835. She will continue to be a technical typist and maintain department processes and practices.



Shaun Ponder moves in the role Anna Hook left and will support the Actuarial Science Program and Conferences. Shaun’s new office will be MATH 820.

Patty Huesca will move into a support role and will assist with webpages, course uploads, and technical typing support. Patty moves into MATH 827.



Rebecca Lank, Program Manager for the National Math Alliance, also moves to the eighth floor. Rebecca’s new office will be MATH 803.



Keep Us Up To Date

Dr. Jingshuang Chen, received her Ph.D. in 2021 under the direction of Zhiqiang Cai. She began working as a data scientist with Microsoft in the summer of 2021. She will use machine learning, statistical and programming skills to collect, analyze, and interpret large data sets for her new job. Prior to her graduation, she had two summer internships. In the summer of 2019, she was a research intern with Disney Research working on cloth simulation of Disney characters. In the summer of 2020, she was a data scientist intern for Microsoft. Outside of work, she enjoys traveling and swimming!



K. N. Raghavan, Professor in the Mathematics Group, The Institute of Mathematical Sciences, Chennai, India, graduated from Purdue in 1991 with a PhD in Mathematics, in commutative algebra under the direction of Craig Huneke. He wrote that he carries fond memories of the math department, especially of the coffee and cake in the library lounge before colloquiums, and the ritual of lunch at the Union with professors Craig Huneke and Bill Heinzer, and also other members of the research group. After a two-year post-doc position at Michigan State University, where Bernd Ulrich was his mentor, Professor Raghavan returned to India.

His research interests have since changed somewhat---to representation theory of groups and related geometry and combinatorics---but the friendships forged during his graduate school years continue unchanged.



“I find myself reading it (PURview) whenever I reminisce about my long-lost freedom in college. Not a day goes by without being grateful for the time I spent at Purdue, and the Ph.D. degree I received under the mentorship of Laszlo Lempert in 2014,” said **Tamas Darvas**.

Since leaving Purdue, Dr. Darvas has been at the University of Maryland, first as a postdoctoral research associate between 2014-2018, then as an assistant professor 2018-2021. This past spring he was promoted to associate professor. During this time Dr. Darvas received an NSF CAREER Award in 2018 and an Alfred P. Sloan Fellowship in 2021.

Dr. Darvas lives in the DC area together with his wife, Timea and their daughter, Anita. The photo provided even has a sprinkle of Black and Gold loyalty!



Dr. Tiziana Giorgi is currently a program rotator at the NSF, working in the Applied Math Program in Alexandria, Virginia, and **Dr. Robert Smits** is guiding his third doctoral student through a thesis in Las Cruces, New Mexico. Their paths, now convergent, sometimes divergent, are strongly recurrent.



Drs. Giorgi and Smits first met at Purdue when they were learning the intricacies of the Hardy-Littlewood maximal operator and averaging properties in Real Analysis II. After passing qualifying exams, they decided to get married over a Spring Break in Rome, Italy. Tiziana went on to take a PhD in Applied Partial Differential Equations under the supervision of Daniel Phillips (1997) and Robert took his doctorate in Stochastic Differential Equations with Rodrigo Bañuelos (1996). Their daughter, Georgia was born as they were finishing their theses, just in time to make the mentions.

After graduation, Tiziana received a Postdoc at McMaster in Canada, while Robert held one at Syracuse, a bit more than 3 hours away. They first solved the 2-body problem with independent positions at Towson University, a predominantly teaching institution in Baltimore before moving to research positions at New Mexico State in 2002, where they joined fellow Purdue Alum, Dr. Irena Swanson, and buying her house shortly before she moved to Reed College. They are active in teaching and research, running departmental seminars and travelling extensively including sabbaticals at Sapienza University of Rome, a Fulbright Fellowship in Lisbon, the ICIAM meeting in Beijing and an untold number of SIAM and AMS meetings. They work regularly at NMSU with two other Purdue Alums, Louiza Fouli and Jonathan Montaña.



Tiziana has received 3 NSF Research Grants for her work on superconductors and liquid crystals while Robert has done research for the NSA and the USAF involving large deviations. Tiziana loves her work as program rotator at the NSF, getting to impact not only the intellectual developments in Applied Math, but also to help make it more available to a wide diversity of talented mathematicians. Robert meanwhile is content to work with students on averaging properties and maximal operators, re-purposing the techniques of Analysis II for new problems as well as directing the Actuarial Science concentration. Their daughter Georgia is a doctoral student in statistics at Cornell University.

*Send your post-graduation news to
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