

INDIANA UNIVERSITY DEPARTMENT OF MATHEMATICS ALUMNI NEWSLETTER

COLLEGE OF ARTS & SCIENCES ALUMNI ASSOCIATION

August 2022, No. 22



CHAIR'S CORNER

Kevin Pilgrim '89

How appropriate that the College's Fall 2021 Themester topic was 'resilience'. "Resilience isn't just a muscle flexing strength, it's also the strength to create joy under tough circumstances," said George Takei, who was a Themester 2017 guest and keynote speaker. After more than a year of tough, pandemic-induced circumstances, it is clear that our faculty, students, and staff personified resilience this past academic year.

A lingering effect of the pandemic, though, seems to be a shortage of people of all sorts, from custodial staff to accountants to faculty. And under these circumstances, developing organizational resilience becomes something requiring planning, effort, and ongoing attention. As we lose experience to retirements and other departures, building the structures to hold us steady when the winds of change blow hard becomes more and more important.

Judging from the successes of the past year, and the continued generous support of our friends, I have no doubts about our ability to continue to thrive and grow. Read on to hear all about this!

Photo of Kevin and his wife, Jane Pilgrim '89

DEPARTMENT NEWS

Our youngest faculty members continue to earn national and international recognition

Julia Plavnik Awarded Major Grants



Julia Plavnik

Charlotte Ann Griffin Assistant Professor **Julia Plavnik** received both an NSF CAREER grant award and a similarly sized grant as part of the Simons Foundation's Collaboration Grant on Global Categorical Symmetries. The grant provides \$8 million of support over four years for an international team of physicists and mathematicians to unlock the power of symmetry in its broadest, most general form. Her award will support

activities including the funding of postdocs, travel, and summer support. The grant is directed by Constantin Teleman of the University of California, Berkeley (who was briefly an undergraduate here at IU).

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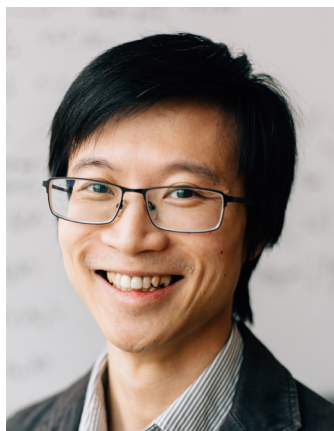
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Said Professor Plavnik, “We did not expect the grant to be awarded upon our first submission. As our application passed more and more levels of review, we got more excited. The process of writing this grant was interesting itself as it broadened our research horizons. I haven’t collaborated with any of the other PIs yet, so this is an amazing opportunity to expand my research program and network.”

Julia was also recognized this year with an Outstanding Faculty Mentoring Award from the Center of Excellence for Women and Technology. The Outstanding Faculty Mentor/Advocate Award is given annually to faculty at IUB who serve as mentors, sponsors, or advocates who motivate and encourage women students. The winner is chosen based on nominations submitted by students and colleagues. This year, 50 IU faculty were nominated. Plavnik has worked to mentor mathematicians from high school students as part of MIT’s “Primes” program, to undergraduates in our local CEWIT and NSF-supported math REU programs, to graduate students here and abroad, to Zorn postdoctoral fellow **Dr. Colleen Delaney**, also a previous recipient of the CEWIT award

Louis Fan awarded grants to study virus dynamics



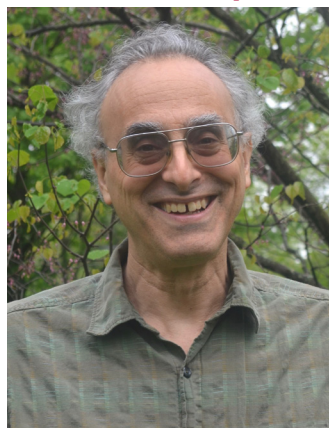
Louis Fan

Assistant Professor **Louis Fan** received major grants to study the dynamics of virus transmission. Professor Fan’s NSF Collaboration Grant award, over \$700K, is joint with the University of Wisconsin-Madison. The funds will support the study of stochastic reaction-diffusion equations on metric graphs and spatially-resolved dynamics of virus infection spread. This award supports the development of new mathematical tools and

biological experiments that are essential to understanding the mechanisms of virus spread and extinction.

Louis’ research is also now supported by a \$45K award from the Hong Kong Research Grant council. His project investigates stochastic modeling of the spatial transmissions of viruses and defective interfering particles. The award enables international collaboration and training of students in STEM fields. The project goal is to develop stochastic simulation schemes for delayed differential equations to study virus spread in two-dimensional domains. He too is a regular mentor for our long-running REU program.

Michael Larsen and Ayelet Lindenstrauss awarded Simons Fellowships



Michael Larsen



Ayelet Lindenstrauss

The program extends academic leaves from one term to a full year, enabling recipients to focus solely on research for the long periods often necessary for significant advances.

Michael will study the interplay between group theory and number theory. A central theme connecting them is monodromy: the study of the symmetries revealed by a parametrized family of geometric objects as the parameter follows a closed loop.

Ayelet will work on calculations of the algebraic K-theory of new central division algebras, and will explore aspects of a way of constructing new algebras, called the Loday construction, from the data of a commutative ring k and a commutative k -algebra R .

Each plans to spend the Fall 2022 term at the Institute for Advanced Study near Princeton University.

THE PROBLEM CORNER

Cut a circular wedge of angle θ out of a round frosted cake, flip it over, put it back, and then rotate the cake by angle θ . (You can try this out for real, but frosting is sticky, so probably it’s easier to do this with two different colors of construction paper glued together into a round!) Now repeat this process over and over. Will all the frosting eventually again be all on top?

Mathematically, this can be modeled by something called an interval exchange transformation. Curiously, these now have deep connections to many areas of mathematics, including geometry, dynamical systems, and number theory.

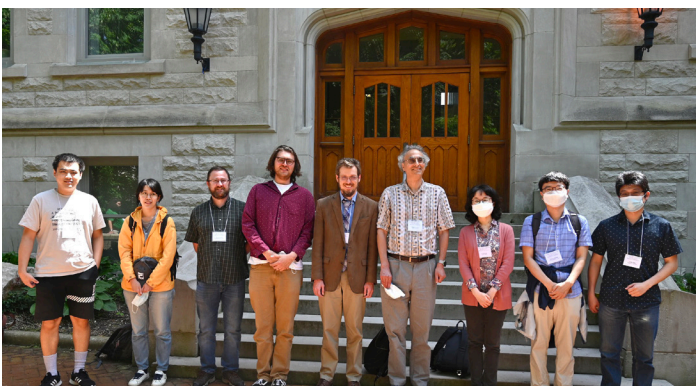
Distinguished Professor Michael Larsen honored with 60th birthday conference

This in-person event took place here June 3-5 and drew mathematicians from across the globe. Talks focused on areas related to his contributions in algebra. The conference was called “Algebra 2022 and Beyond” and was organized by alumna **Bo-Hae Im** (PhD '04) of KAIST, Korea; Ravi Ramakrishna of Cornell University, and Pham Tiep of Rutgers University.

Photos courtesy of Ayelet Lindenstrauss



Ching-Li Chai, Michael and Carlos Simpson



Michael with some students past and present, left to right: Boyuan Xiong, Nai-Heng Sheu, Chris Thornhill, Nathaniel Lowry, Erik Wallace, Michael himself, Bo-Hae Im, WonTae Hwang, Sailun Zhan



Chandrashekhar Khare



Ravi Ramakrishna

Victoria Noquez appears on Penn and Teller’s “Show Me” tv show

Dr. Noquez, who goes by *Tori*, received her PhD from the University of Illinois at Chicago in 2017 and joined our faculty as a Zorn postdoctoral fellow in the Fall of 2019.

In addition to teaching undergraduate and graduate courses and doing cutting-edge research in mathematics, she is a professional magician. The two subjects are closely related. For example, there is a lot of mathematics involved in card shuffling; you can watch *Tori* describe an example here:

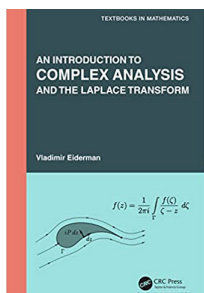
<https://bit.ly/3J0hGqI>

Tori performs her magic all over the country and is a regular headliner at such prestigious venues as The World Famous Magic Castle in Hollywood, CA. During the pandemic, *Tori* presented interactive magic shows to hundreds of people via Zoom and Facebook Live. Her virtual shows raised money for various local and national charities providing COVID-19 relief. For more information, visit <https://www.torinoquez.com/>. She was interviewed this year on national tv, which you can view here: <https://bit.ly/3czDSLl> She will be an Assistant Professor of Mathematics at St. Mary’s College in California.

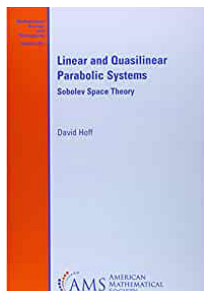


Tori Noquez

New books authored by Math faculty

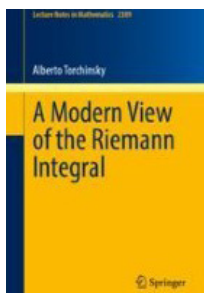


“Complex analysis”, said a physicist once, “is the only subject clearly created by God.” A new complex analysis textbook by Rothrock Senior Lecturer **Dr. Vladimir Eiderman** has been published by Chapman and Hall/CRC Press. The formula on the cover is part of Cauchy’s Integral Formula, which under suitable conditions expresses the value of an analytic function at a point in terms of its values on a simple closed curve surrounding that point. The image on the cover references one of numerous important applications, including to the study of fluid flow.



A new graduate textbook in partial differential equations by Professor Emeritus **David Hoff** has been published by the American Mathematical Society as part of its Mathematical Surveys and Monographs series. How does heat flow? How does water move? How does air flow around a wing? These questions are often modelled by systems of partial differential equations (PDEs). A subtlety is that while the

equations involve derivatives of functions, in many situations the solutions to the equations can become irregular, having no derivatives. You can see this in the vortices that form when pulling a canoe paddle through a river, or in the turbulence in a plume of smoke from a candle. Mathematically, this is dealt with through careful construction of suitable spaces of functions in which to model the physical system. The book collects material previously spread through disparate sources, and presents a coherent general theory.



Professor Emeritus **Alberto Torchinsky** has just published a new book on the classical topic of the Riemann integral. The idea for the text arose, curiously, out of conversations related to signal processing with his son IU alum **Darius** (BS Math and Physics ’99). Historically, the development of the theory of integration went through many phases, with Riemann’s more concrete version appearing before Lebesgue’s more

abstract version. This monograph, published in the prestigious Springer Lecture Notes series, embarks on an exploration rooted in Riemann’s original viewpoint.

Zorn Postdoctoral Fellowship Program Revived



Christopher Felder

After intense negotiations with College leadership, our Zorn postdoctoral fellowship program begins again Fall ’22. Joining us new this year are **Christopher Felder**, Wash. U/St. Louis, who will work with **Hari Bercovici** and **Norm Levenberg**; **Mayuresh Londhe**, Indian Institute of Science, Bangalore, who will work with **Norm Levenberg**; **Seppo Niemi-Colvin**, Duke U., who will work with **Dylan Thurston**; **Joshua Southerland**, U. Washington, who will work with **Chris Judge**; **Hector Martin Peña Pollastri**, Universidad Nacional de Cordoba; will work with **Julia Plavnik**.



Mayuresh Londhe



Seppo Niemi-Colvin



Joshua Southerland



Hector Martin Peña Pollastri

Welcome New Faculty

In collaboration with IU's Cognitive Science Program, we are delighted to welcome **Dr. William Holmes '10** as Associate Professor in Mathematics. He brings outstanding skillsets in mathematical modeling in diverse areas, including cell motility and human cognition. His spouse, **Dr. Jennifer Trueblood**, will be joining IU's Psychology Department. From IU, she earned a Bachelor's in Music and Mathematics in 2007, a Masters in Mathematics in 2009, and her PhD in Cognitive Science.

We are excited to introduce **Dr. Corrin Clarkson** as our inaugural Director of General Education Mathematics courses and Clinical Associate Professor. Meeting our instructional mission at 0-, 100-, and 200-level is an incredibly complex task. Dr. Clarkson will provide support to our coordinators and faculty as we navigate transitions in the coming years. She received her PhD in mathematics from Columbia University in 2014 and was a Zorn postdoctoral fellow here 2014-17 and then a Clinical Assistant Professor at NYU. During her time here she co-founded our Directed Reading Program, which pairs graduate and undergraduate students for term-long reading projects. She was an MAA Project NExT fellow and organizer of the New York City Teaching Seminar for several years. *(Photo by Laurie DeWitt of Pure Light Images)*



Corrin Clarkson

Also joining us this Fall are two new core lecturers. **Dr. Andrew Jenkins** received his PhD this Spring from the University of Georgia. **Dr. Branden Neese** received his PhD from IU in 2013 and taught at Marian University and IUPUI. He will coordinate our Math-J courses that serve the Groups Program, which provides small-class environments for first-generation students.



Annie Baugh



Dami Lee

Joining us for new visiting appointments are lecturers **Dr. Jared Able**, **Dr. Sanjana Agarwal '22**, **Dr. Dami Lee '18**, **Sharon Hoffman Pauly '22 Education** (expected), **Dr. Shawn Williams** and **Annie Baugh MS '16 IUPUI**. Sanjana will direct our Math Learning Center; Sharon will coordinate our Math-D courses, with which she's been involved for five years; Annie has 10 years' experience teaching in middle and high schools and experience with Finite Math in IU's Advance College Project and will coordinate our M014 and M018 courses.



Sanjana Agarwal

RETIREMENTS

Jee Koh

Professor **Jee Koh** retired on December 31, 2021, after 34 years in the Department of Mathematics at Indiana University. His colleagues and friends thank him for his contributions to mathematics research, education, and outreach.

Jee was born in Taegu, Kyungbuk, Korea in 1951. Jee came to Indiana University in 1988, was promoted to Associate Professor in 1991, and to Professor in 2002. Jee served two terms as Director of Undergraduate Studies.



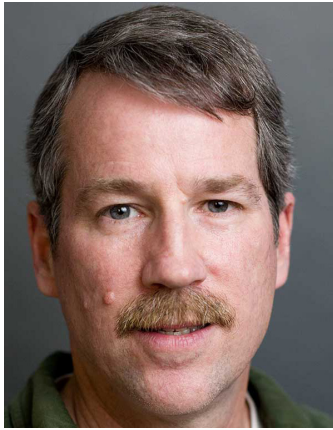
Jee Koh

Jee's research was focused on commutative ring theory. His earlier work was on the direct summand conjecture, part of a program in the theory of local rings referred to as the Homological Conjectures. He made substantial contributions on this conjecture, obtaining the first positive results in the equicharacteristic case. He directed the theses of six PhD students, including several in cryptography.

Over his career, Jee was also deeply involved in mathematics education. Jee's involvement in mathematics education extended nationally and internationally, as a liaison between American and Korean mathematics. We thank Jee Koh for his many accomplishments, and wish him a most pleasant retirement.

*Darrell Haile
Paul Kirk
Kevin Pilgrim*

Steve McKinley



Steve McKinley

Dr. **Steve McKinley** attended IU and graduated in 1985 with majors in mathematics and psychology. He continued his studies at IU, getting an M.A.T. degree in 1988, a Ph.D. in psychology in 1994, and an M.A. in mathematics in 1996. This background in psychology and cognitive science, statistics, and mathematics combined with his clearly evident and natural classroom skills led to his being hired by the Mathematics Department.

He started as a part time Lecturer in 1998 and progressed to the position of Senior Lecturer by 2008.

While at IU, he taught a wide spectrum of courses ranging from 100-level courses to senior level probability. Most notably, he taught Finite Math.

Steve also starred in “The Finite Show,” a live show directed, written, and created by Steve using funds made available as part of a Lilly Foundation Retention Grant. All of these shows can be seen at <https://bit.ly/3PSHvjf>. Click on “[finite_3-4](#)” to see Steve as a dog.

Without a doubt, his years here strengthened the undergraduate experience in mathematics at Indiana University, and we are all thankful for his many contributions.

Scott Anderson

Tracy Whelan



Tracy Whelan

Dr. **Tracy Whelan** joined the Mathematics Department at Indiana University in 2002. At the time she joined the department, she already had substantial experience teaching undergraduate mathematics and she also had experience using mathematics in computer graphics. She has been a very positive, major contributor to the missions of the department for the last 20 years.

Tracy regularly taught 100 and 200 level courses, our History of Math course, and our AI pedagogy course.

Tracy also played a key role organizing and coordinating the many sections of these courses. As such she wrote departmental exams and helped all of the instructors deliver a consistent course with uniform standards.

Tracy’s outstanding record in teaching has been recognized by the department and the campus. She received the Trustees Teaching award, the Lecturer’s award for outstanding teaching (twice) and was nominated and became a member of IU FACET.

At the same time that she was doing her own teaching and coordination work for the department, Tracy played a key role in the College of Arts and Sciences Advanced College Program (ACP).

Tracy will be sorely missed.

She looks forward to more visits with sons Gavin and Garth who, serendipitously, are both in Austin, Texas.

Daniel Maki

DEPARTURES



Erica Isaacson

Senior Lecturer Dr. **Erica Isaacson** has left her teaching position to pursue her passions in art, including illustrated books. She earned dual honors degrees in Mathematics and Physics from IU in 2006 and her PhD in Mathematics at the University of California at Berkeley in 2012. She joined us as adjunct lecturer 2012-14 and as lecturer in 2014 and was promoted to Senior Lecturer in 2021. She regularly taught Finite, Calculus I and II, and

developed extensive materials for our Exploring Mathematics Ideas “intensive writing” course. We wish her well.

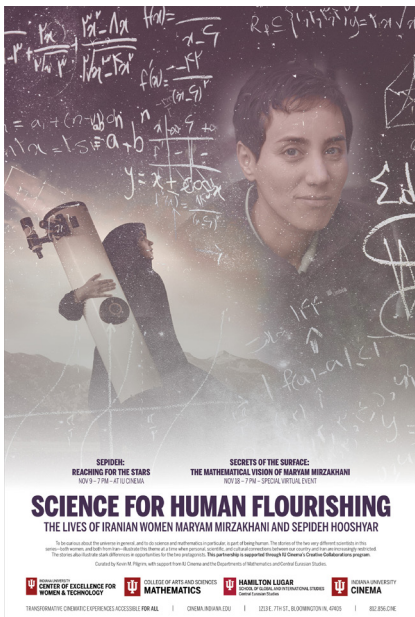
Kevin Pilgrim

EXTERNAL REVIEW OF GENERAL EDUCATION COURSES

In early April, we hosted an external review of our teaching mission at 0-, 100-, and 200-level. Three national experts—Jim Fowler of Ohio State University, Chris Rasmussen of San Diego State University, and Ralf Spatzier of the University of Michigan—were joined by former College Associate Executive Dean Jim Musser in reviewing all aspects of our mission. Over a day and a half, they interviewed diverse constituents, including freshman students in Finite and other courses, graduate students, and faculty of all classifications. Their recommendations include both the expected (smaller classes, more faculty, higher salaries) and the surprising (elimination of non-credit-bearing courses). As a first step, about two dozen of our faculty and graduate students met over two days in mid-May to reflect on the review’s findings and to prepare for launch of Fall 2022. We met with College leadership in August to discuss these recommendations and begin implementing a multi-year plan.

OUTREACH

IU Cinema screens “Secrets of the Surface” The documentary, by George Csicsery, examines the life and mathematical work of Dr. Maryam Mirzakhani. In 2014, she was both the first woman and the first Iranian to be honored by mathematics’ highest prize, the Fields Medal.



Poster courtesy of IU Cinema

The screening, introduced by IU College of Arts and Sciences Mathematics chair **Kevin Pilgrim** and hosted by IU HLSGIS Central Eurasian Studies faculty member Shahyar Daneshgar, was followed by a panel discussion. Panelists were

- Hussein Banai, Assistant Professor of International Studies, Indiana University; Research Affiliate, Center for International Studies at MIT
- Laura DeMarco, Professor of Mathematics, Harvard University
- Shabnam Kavousian, Senior Lecturer of Informatics, Indiana University
- **Julia Plavnik**, Charlotte Ann Griffin Assistant Professor in Mathematics, Indiana University

Kavousian and DeMarco were classmates of Mirzakhani in Iran and at Harvard, respectively. On 14 July 2017, Mirzakhani died of breast cancer at the age of 40.

The panel discussion, featuring questions posed by both host and audience, was wide-ranging. Topics included comparisons and contrasts on perceptions of women in science in Iran and the US, and the numerous challenges faced when pursuing science in the face of different kinds of obstacles.

The screening was preceded a week prior by a live showing of “*Sepideh: Reaching for the Stars*”, a docu-drama about the life of Sepideh Hooshyar, a young female astronomer in Iran. The two films comprised an IU Cinema short series called Science for Human Flourishing.

Return of Science Fest

After going virtual in 2020, Science Fest returned to campus this year on Saturday, October 9! This annual event provides fun-filled, educational experiences for kids of all ages and draws hundreds of families to IU Bloomington. Our department shared the excitement of math by hosting 3 activity stations:

- Build Complex Geometric Shapes
- Logic Games and
- Topological Puzzles



Julia Robinson Math Festival

On March 5th, our Women in Math Club hosted the Julia Robinson Math Fest for kids. The activities were aimed at kids ages 4-9. The Julia Robinson Mathematics Festival aims to inspire joy in mathematics through exploration and collaboration. They do this through engaging educators and students through festive events, supporting underserved and underrepresented communities, and creating high-quality, accessible materials. More info is here: <https://www.jrmf.org/events>. The Club is led by IU math major **Greta Stephenson** and mentored by IU Mathematics faculty member **Julia Plavnik**, Charlotte Ann Griffin Assistant Professor. For its efforts, this officially-sanctioned IU student organization was

awarded first-place winner in Event of the Year for an IU student organization. Check them out at https://www.instagram.com/wim_iu/



Photos provided by the Women in Math Club

GRADUATE PROGRAM



*Matthias Weber
Director of Graduate Studies*

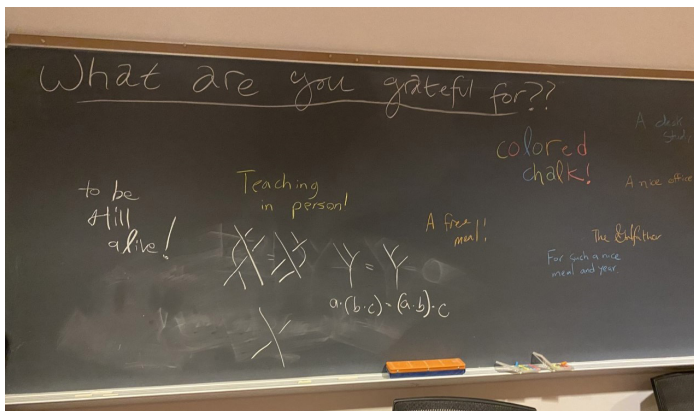
The academic year in our graduate program began with the transition from DGS emeritus **Matthias Strauch** to DGS **Matthias Weber**, who is returning to the office for a second term.

While classes returned to in person instruction with masks, the pandemic showed its lasting impact also on the graduate program: Vaccination requirements for incoming students and personal distress due to illness among friends and family often required us to find creative ad-hoc solutions for finding substitutes or to help out in emergencies. We are immensely grateful to everybody who stepped in on short notice.

GradsGiving



Travel restrictions prevented many of our graduate students to return home over Thanksgiving Break. Our graduate secretary **Susan Palmiotto** organized a departmental Thanksgiving (GradsGiving) that we hope will become a departmental tradition.



Students share for what they are grateful

Tiger

Susan's Golden Retriever Tiger has been helping out as our emotional support dog for many members of the department.



A very good boy



Susan Palmiotto (left) with graduate students Ayça Durmaz (center) and Nai-Heng Sheu (right)



Tiger with graduate student Christian Cofoid



Professor Peter Sternberg poses with Tiger

Graduate Student Strike

On April 13, the Indiana Graduate Workers Coalition-UE began a strike action with two main demands: To be recognized as a union, and to negotiate higher stipends. The strike continued through the end of the semester and has had a campus wide impact. Talks are continuing with the hope that a solution can be found by the beginning of the fall semester.

In breaking news, on August 2, the Provost announced a significant increase in stipends to \$22K and the elimination of other fees.



Our Graduates of 2022



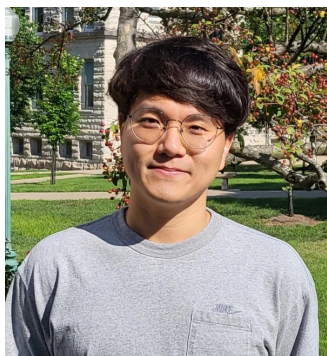
Hayley Bertrand



Homin Lee



Daniel Condon



Seok Hyun Byun

We congratulate our students who graduated in 2021-22 (with their current postdoc position or employment given in parentheses):

PH.D.

Hayley Bertrand (University of Wisconsin, Whitewater)

Dylan Spence (University of Wisconsin, Whitewater)

Siyuan Tang (Peking University, Postdoc)

Homin Lee (Northwestern University, Postdoc)

Anuj Kumar (Florida State University, Postdoc)

Patrick Chu (Purdue Polytechnic High School in South Bend, Indiana)

Krutika Tawri (University of California Berkeley, Postdoc)

Sean Sanford (The Ohio State University, Visiting Assistant Professor)

Daniel Condon (Williams College, Postdoc)

Seok Hyun Byun (Clemson University, Postdoc)

Sanjana Agarwal (Indiana University, Visiting Lecturer)

The remaining names in this section are people who we expect to graduate but have yet to defend or file a PhD Announcement

Adnan Cihan Çakar

Daniel Freese (D.O.D., Applied Research Mathematician)

Noah Kaufmann

MA

Franco Storino // Jacob Guttman // Ayça Durmaz // Zuyi Zhang // Nasheed Jafri // Emmett Dorlester // Moshe Stein // Tiancheng Xu

Recruiting

In the spring semester, we recruited a new cohort for 2022/23 of 34 students from 11 countries. This extraordinary large number was necessary to compensate for small cohort sizes in previous years and the many graduating students.

Of the new students, 12 are women. One student comes with an NSF fellowship, one has received a President's Diversity fellowship.

Two students have been admitted to the MAT program.

We are proud that despite disturbingly low stipends we are still competitive.

INMAS Program

For the second year, as part of our participation in the Internship Network in the Mathematical Sciences (INMAS) NSF infrastructure grant, we have several graduate students participating in paid internships this summer.

Daniel Condon is working at Eperture <https://eperture.net> the company makes software to assist people with cognitive decline.

Nicolas Escobar

Velasquez has a position at Megadalon Solutions <https://megadaltionsolutions.com> Directed by IU chemistry faculty Martin Jarrold and David Clemmer, the company employs proprietary technology to extend the precision of mass spectrometry to new classes of molecules in the nanometer size regime.



Nicolas Escobar Velasquez

Samanwita Samal is working at Carbon Solutions <https://www.carbonsolutionsgroup.com> The company is involved in several markets, including carbon credits, electric vehicle charging stations, Leadership and Environmental Design ("LEED") certification, and others.

Ramazan Yol is the second of our students to intern at Bee Corp <https://www.thebeecorp.com> in Indianapolis, which develops technology for beehive health management.

This fall, we will take applications for Summer 2023 internships.



Ramazan Yol

UNDERGRADUATE PROGRAM



Shouhong Wang
Director of Undergraduate Studies

This past year was still a challenging year for students, parents, professors, graduate assistant instructors and undergraduate instructors (UGIs) and undergraduate graders (UGGs), advisors, and supporting staff members. I thank you all for your hard work, effort, and patience in making this year a successful year. Here are a few of the most notable achievements by our undergraduates.

Fifteen math majors: **Kylie Lewis, Zachary C. Monroe, Isaak M. Mount, Jillian Pence, Jonathan Ralstin, Dashiell Schonemann-Poppeliers, George Stylianou, Andrew K. Weissmann, Tyler J. Zhang, Christina Duffield, Greg Lukens, Gabbie Moreno, Graham Seiler, Liam Sherman, and Tianshu Yu** were elected to Phi Beta Kappa.

The five-student team of **Eric Herbst, Henry Bobeck, Hariharan PV, Michael Dineen, and Ann Renholzberger** won the seventh annual Society of Actuaries (SOA) international student research case study challenge.



Eric Herbst



Henry Bobeck

IUB also won last year; this is the first time that any school has won twice. The team members represented the diverse talents of IUB students. Actuary Club President Eric Herbst organized the team; he is a junior finance and business analytics major from Zionsville, IN. Eric was also on the winning team last year. The rest of the team consisted of senior computer science major Henry Bobeck, also from Zionsville, sophomore finance major Michael Dineen from Glenview, IL, junior mathematics and economics major Hariharan PV from Bangalore, India, and junior economics and psychology major Annie Renholzberger from Indianapolis, IN.



Hariharan PV



Michael Dineen

Each year, a case study is released with fictional data. Students work over the course of eight weeks to respond to the open-ended study, representing realistic actuarial challenges. Fifty-nine teams from around the world submitted reports with their recommendations. After IU's team, the other five finalist teams came from the US (two), Australia, and China (two).



Ann Renholzberger

The team was mentored by **Russell Lyons**, who is the department's James H. Rudy Professor. "As always, this year's case study was very challenging," said Prof. Lyons. "Despite other demands on their time, our team worked hard with a great degree of independence. Once they advanced to the final six, they needed to prepare a presentation and answer questions from the judges—during IU's finals week! I was extremely impressed with both their written report and their oral presentation."

Beyond the classroom, our undergraduates have been making wonderful use of research opportunities, such as working alongside professors and getting involved in research related programs.

Senior **Tianshu Yu** has worked on various research projects in different IU labs, and has taken and excelled in over 10 graduate level courses during his undergraduate studies.

Junior **Sarah Peterson** was part of a reading group with Professor **Matthias Weber** on three dimensional hyperbolic polyhedral and participated in Lab of Geometry (LOG) in Spring 2022; see below.

Junior **Daniel Rickert** is currently working at IU Mathematics REU (Research Experience for Undergraduates) with Professor **Louis Fan**.



Tianshu Yu



Christina Duffield

Senior **Christina Duffield** was working on hyperbolic geometry and tiling with Professor **Matthias Weber**.

Junior **Robert Grimley** worked with Professor **Matthias Strauch** on finite reflection groups and Coxeter groups.

Sophomore **Ethan Steward** has a huge interest in applying mathematics to meteorology and is working this summer at the National Weather Service in Paducah, KY.

Junior **Clara Lietzke** has been an active member of Women in Math club, and worked in the Raff lab, doing research in atmospheric chemistry. This summer she is participating in an international REU through the University of North Dakota in Prague, Czech Republic. Her project focuses on the ultratrace analysis of environmentally



Clara Lietzke

important metals by use of atomic spectroscopy.

Senior **Yijia Chen** worked alongside Professor **Kevin Zumbrun**, resulting a joint research paper: Luca Castornova, Yijia Chen, Kevin Zumbrun, Game-theoretic analysis of guts poker; see <https://arxiv.org/abs/2108.06556>.



Bethany Mussman



Jasper Baltz

Lab of Geometry (LOG) is a departmental program first introduced in the Spring semester 2019 under the supervision of Professor **Dylan Thurston**. The aim of this program is to understand a concept deeply enough so that you can tell a computer to produce meaningful pictures from which you can get further insights and conjectures.

The 2021-2022 LOG program was coordinated by Professor **Matt Bainbridge** and a graduate student **Caroline Davis**. Math majors **Lane Eghyazi**, **Jasper Baltz**, and **Bethany Mussman** worked on projects in Fall 2021, and math majors **Ahmed Awad**, **Bethany Brinson**, **Bethany Mussman**, **Jessica Missey**, **David Gerth**, **Kaisen Ye**, **Hazel Levine**, and **Sarah Peterson** worked on projects in Spring 2022. To read more about the Laboratory of Geometry, visit <https://sites.google.com/view/laboratory-of-geometry-iub/home>

Another research related program is the **Directed Reading Program (DRP)**, which pairs undergraduates with graduate students to learn an advanced topic of the undergraduate's choosing. This year the program is mentored by Professors **Noah Snyder** and **Matthias Strauch**. Math majors **Vamsi Bidthanapally**, **Jacob Renner**, **Jasper Baltz**, **Trevor Cunningham**, and **Zachary Lichtenstein** participated the fall 2022 DRP program, and math majors **Enoch Ayeh**, **Nick Adkins**, **Jessica Missey**, **Jacob Renner**, and **Tianshu Yu** participated the Spring 2022 DRP program. More information can be found on its webpage: <https://math.indiana.edu/student-portal/directed-reading-program/index.html>



Brooke Augustine



Zayn Karim

The **Women in Math Club at IU** organized Julia Robinson Math Fest for kids, which was named **IU Student Organization Event of the Year**. See descriptions at the Chair's Corner. The club officers include math majors: **Greta Stephenson** (president), **Brooke Augustine**, **Lucy Lippman**, **Zayn Karim**, and **Clara Lietzke**. The club is mentored by IU Mathematics faculty member **Julia Plavnik**. See https://www.instagram.com/wim_iu/ for more info.

Several graduating seniors are going to pursue graduate studies, including **Tianshu Yu** to Duke University studying quantum computing, **Christina Duffield** and **Dalton Sconce** to IU Mathematics graduate program, **Yijia Chen** to UIUC mathematics PhD program, **Kali Konstantinopoulos** to MD/PhD program at IU Medical School and Purdue Biomedical Engineering, **Oliver Allen** to Network Science PhD program at Northeastern University in Boston, and **Marshal Gress** and **Chong Gu** to IU Luddy CSCI program. We wish our graduates all the best in their future endeavors.

STAFF NEWS

Amanda (Mandie) McCarty was promoted to Fiscal Officer; we are celebrating her 25th year with us. Stepping into Mandie's role is **Andrea (Andi) Patterson**. We hope to be filling the newly vacant Accounting Representative position soon. Now that post-pandemic our faculty are traveling and conferences are happening, our accounting office expects to be very busy.



Mandie McCarty with her children



Teresa Mandell

We welcome **Teresa Mandell** as our new Scheduling Officer. Given our size and complexity, we decided this position would be best supported by a full-time staff member. Teresa is working closely with Academic Specialist **Chris Parks** to learn the job over the next year.

ALUM NEWS

With hundreds of our majors and graduate students earning their degrees each year, it's hard to know where to begin reporting their news. If you, too, have news to share or a story to tell, visit <https://math.indiana.edu/forms/alumni-stories.html>

Dr. Laura (Goins) Callahan '10 received her PhD in Philosophy from Rutgers in 2019 and returned to Indiana as an Assistant Professor at Notre Dame. In questions such as: How are we responsible for our beliefs – especially our moral and religious beliefs? What are the distinctive desiderata for such beliefs (know-how? understanding?), and what does forming these beliefs virtuously involve? How do social roles and interpersonal relationships shape these epistemic responsibilities?

Manasse Kwete '19 and **Hannah (Morton) Graber (?)** are high-school teachers.

DID YOU KNOW?

We have an MAT program that financially supports at least two students per year, and graduates of that program, with little extra effort, can obtain a license to teach mathematics in Indiana? For more information, contact our DGS, **Matthias Weber**.

Dr. Toan T. Nguyen wins T. Brooke Benjamin SIAM prize. Nguyen received his PhD in 2009 from IU, working with Distinguished Professor **Kevin Zumbrun**. The SIAM Activity Group on Nonlinear Waves and Coherent Structures presents this award every two years to one mid-career established researcher for recent outstanding work on a topic in nonlinear waves, as evidenced by a body of work with at least one significant publication in English in a peer-reviewed journal within the four calendar years preceding the award year.

The citation recognizes “extensive and deep contributions to the mathematical theory of the dynamics of gas and fluids.” He received the AMS Centennial award in 2018 and was just promoted to Professor at Pennsylvania State University.

Dr. Valkyrie Savage (BA '10) received her PhD in computer science from the University of California at Berkeley in 2016. After diverse experiences, including service as CEO of Savage Internet and as a Research Scientist with the Bike Brigade In Toronto, she became an assistant professor at the University of Copenhagen.

Dr. Jacek Skrzypalin '10, '12 received his PhD from Stanford in 2016; he is now a quantitative researcher at Jump Trading in Chicago.

Dr. Wayne Tarrant MA '98 is Associate Professor of Mathematics at Rose-Hulman Institute of Technology in Terre Haute, Indiana. He is just returned from a yearlong stay as a Fulbright Scholar at Strathmore University in Nairobi, Kenya.

ALUMS AND FRIENDS GIVING BACK

Frank Graves BA '75 is an economist, co-founder of consulting firm Brattle, and part-time professional violinist. "I have been able to build on my math skills and become quite successful... and have been able to give some back to IU to its School of Music and its Department of Mathematics, which is very gratifying for me as a token of thanks for the foundation you all provided," said Frank.

Frank served as chairman of the board of advisors to the IU Jacobs School of Music.

Young alums return for virtual visit. Four young College alums, all working as consultants, visited us virtually to share their stories and experiences with our current students as part of the College's Liberal Arts Impact series of events. The online event set attendance records, with over 450 students participating.

Alli McCarty graduated in '21 with a statistics major and minors in math and biology. She is now an Application and Program Analyst at Deloitte in Chicago, IL. After a few years in basement labs working alone at IU, she sought a different track. She found the Walter Career Center especially helpful in finding opportunities. "Ask everyone that you talk with to introduce you to another person!"

Ann Marie Matheny graduated in '20 with a statistics major and math and spanish minors. She is now a Senior Consultant at Guidehouse in Austin, TX. While at IU she was a Little 500 rider and involved in IU Outdoor Adventures. At Guidehouse, she develops complex statistical models for analyzing the adoption of electric vehicles. "If you do what you like, people will respect that."

Javier Fuentes-Rohwer graduated in '19 with majors in mathematics and economics. He is now a Senior Associate at RSM US LLP in Denver, CO and is applying to law school.

Charlie Rosenthal graduated in '20 with a mathematics and economics major and a business minor. He is now a Sales Operation Analyst II at Oracle in San Francisco, CA. "Math is the most portable skill," according to Charlie. Early experience in sales honed his skills in communication and presentation that now allow his technical expertise to have more influence.

AWARDS

We held our annual awards ceremony in-person again in April. Check out the program on our news website at <https://bit.ly/3zqSuGn> We are proud of all our awardees.

Undergraduate Awards

Thelma Abell Prize

Christina Duffield and Zayn Karim

Gail Homan Adele Mathematics Scholarship

Sophia Hamza, Tatum Hayes, Sophie Greenfield, Bethany Mussman, Claire Overfelt, and Katie Pletz

Ciprian Foias Prize

Matthew Hayden

Ruth E. Gilliatt Memorial Scholarship

Clara Lietzke and Lucy Lippman

Trula Sidwell Hardy Scholarship Fund

Jacob Renner

Cora B. Hennel Memorial Scholarship

Maximillian Newman, Ethan Stewart and Hunter Stewart



Ethan Stewart



Hunter Stewart

Jeffrey and Deborah King Scholarship

Daniel Rickert

Anne B. Koehler Scholarship

Lucy Lippman and Daniel Rickert

Corey M. Manack Memorial Scholarship

Sarah Peterson

Rainard Benton Robbins Prize

Dalton Sconce

Kierstyn Roberts Memorial Award

Christina Duffield

Graduating Senior Recognition Award

Tianshu Yu

Shabani Book Fellowship

Liam Sherman

Marie S. Wilcox Scholarship

Caroline Davis, Sarah Peterson, Sophia Hamza and Hunter Stewart

William P. Ziemer Student Assistance Fund

Seok Hyun Byun, Marshal Gress and Sarah Peterson

M118 Undergraduate Intern Award

Brooke Augustine

Mathematics Award for Academic Excellence

Oliver Allen, Enoch Ayeh, Chong Gu, Evan Halloran, and Dashiell Schonemann-Poppeliers



Oliver Allen

Graduate Awards

Hazel King Thompson Fellowship

Abhishek Adimurthi, Ramyak Bilas, Kevin Buck, Shival Dasu, Conor Doig, Ayça Durmaz, Chengzhang Fu, Christiane Gallos, Dorothea Gallos, Alex Glickfield, Carson Hammer, Lawford Hatcher, Inhak Hwang, Nasheed Jafri, Akash Jena, Legrand Jones, Somi Kang, Nadav Kohen, Yi-Lin Lee, Aolong Lee, Tony Wei Li, Ahram Lim, Justin Lin, Zitian Liu, Maximillian Newman, Evan Phares, Mark Ronnenberg, Sean Russell, Dimitris Sakellariou, Nai-Heng Sheu, Yue Shi, Ricky Simanjuntak, Kai Smith, Benjamin Spencer, Zichuan Wang, Aric Wheeler, Boyuan Xiong, Xinwu Yang, Alfred Yerger, and Zuyi Zhang

College of Arts and Sciences Fellowship

Abhishek Adimurthi, Ramyak Bilas, Carson Hammer, Lawford Hatcher, Legrand Jones, Nadav Kohen, Grey McCarthy, Benjamin Spencer, Abigail Watkins, and Fernanda Yepez-Lopez

Robert E. Weber Memorial Award

Zichuan Wang

James P. Williams Memorial Award

Nadav Kohen

Robert K. Myer Graduate Fellowship in Mathematics

Noah Kaufmann

Muriel Adams Stahl Graduate Fellowship

Abigail Watkins



Abigail Watkins



Samanwita Samal

William B. Wilcox Mathematics Award

Nathanial Lowry

College of Arts and Sciences Travel Award

Kapil Chawla and Homin Lee

David A. Rothrock Teaching Award

Samanwita Samal, Ryan Stees, and Ramazan Yol

Bhatnagar Award for Outstanding Thesis in Applied Mathematics

Krutika Tawri

Outstanding Thesis Award

Daniel Freese

Faculty Awards

Rothrock Mathematics Faculty Teaching Award

Michael Mandell

CEWIT Outstanding Faculty Mentor/Advocate Award

Julia Plavnik

Indiana University Trustees' Teaching Award

Ciprian Demeter and Norm Levenberg

Zorn Teaching Award

Salman Siddiqi

Math Department Service Award

Matthew Bates and Chris Parks



Michael Mandell

GIVING

The Department of Mathematics is grateful for all of the support it receives from its generous donors. The Department has several funds to which you can give. Donations may be made using the attached Indiana University Foundation Donation Form or through the Give Now link at <https://math.indiana.edu> found by following first "About" and then "Alumni and Giving".

- Mathematics Enrichment Fund (I380008688): Gifts to this fund will be used for the general support of the Mathematics Department, in the College of Arts and Sciences.
- William P. Ziemer Student Assistance Fund (P370013557): Gifts to this endowment are used to support both undergraduate and graduate students in the Department.
- Glenn Schober Memorial Fellowship Fund (I380008692): Gifts to this fund support fellowships in the department. The fellowship may support such things as travel and registration fees for students attending national meetings.

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IN MEMORIAM: John Challifour



John Challifour

Professor John L. Challifour, (83), passed away unexpectedly on Saturday, November 27, 2021, at home. We asked several of our community members to share their thoughts.

Kevin Pilgrim '89: Born in Bristol, England, John earned a mathematics degree from the University of California at Berkeley, and returned to England to study at Cambridge University for his PhD in

Mathematical Physics, finishing in 1963. He taught at Princeton University and Brandeis before coming to IUB in 1968 where he remained until his retirement in 2007.

John's research focused on quantum theory, most recently on quantization of lattice Higgs-Yang-Mills fields, with papers frequently appearing both in physics and in mathematics journals. He also authored a textbook, *Generalized Functions and Fourier Analysis: an Introduction*, which appeared in 1972. In 1984 he was elected Fellow of the American Physical Society. John served as associate editor of the *Journal of Mathematical Physics* for 13 years.

John's teaching was recognized with several teaching awards, including two Physics Graduate Teaching awards and a College Teaching Incentive award. With faculty in the School of Education, he was co-PI on multiple Graduate Assistance in Areas of National Need grants, totalling over \$1.6M, between 1994 and 2002.

He will be sorely missed by all who knew him. John is survived by Amber, his wife of 54 years, and three sons.

Edward Timko '17: I met John Challifour at a physics teatime not long after I had started graduate school. The tea might have been for introducing the new graduate students to the research faculty. I was immediately struck by John's wit and clarity, and I was quickly convinced that I should work with him. His demeanor was often level and calm, tinged with air of mischief. My interactions with him fundamentally altered my perspectives on physics and mathematics, and he introduced me to aspects of both that I had never seen before. My decision to work with him had an enormous impact on my life, and it would ultimately lead me, under his advice, to pursue advanced study in mathematics.

John's attitude toward research was that it should be fun, and, for it to be fun, it must be taken seriously.

That meant a full engagement with the project; it is not enough to sit at a distance and appreciate the view, one must get down there in the fray. He had a fearlessness in his approach to research. There was seldom a topic that John was unwilling to engage with, even if it meant spending many weeks or more

picking through the details of unfamiliar texts or working out the details that are so often "left as an exercise". John also had a sense of joy and wonder in his work, expressing gratitude and happiness for being able to play in the world created by so many great minds.

John's sense of humor also left a distinct impression on me. He had a love of "The Goon Show" and Spike Milligan, and John would sometimes apply elements of their comedy to conversation. John's humor was woven into almost every interaction I ever had with him. For example, when he found himself saying something with an element of chance or doubt, he would seek out the nearest piece of wood to tap with his fingers. After moving to an office that lacked wooden furniture, he would instead pause, extract a wooden ruler from the drawer, tap on the ruler, and then return it to its former place in the drawer, grinning at you the whole time. On another occasion, a person who felt that they had stumbled upon deep insights into the workings of the universe came to his door as we were in a meeting. The man expressed interest in relaying these ideas to a theoretical physicist, at which point John informed him that we were mere mathematicians - the theoretical folks where down the hall to the left. When the man left, John smiled, and we continued our meeting.

John was a great friend and an excellent mentor. I think of him often, both in my work and in my personal life, and I know that I carry his influence with me wherever I go.

Erica Isaacson '06: This news hits me hard. John was one of the most important mentors in my life. When I was an undergraduate here, I took his M311-M312 series in the fall of 2003 and the spring of 2004. He helped me realize that I was good at math and encouraged me to keep studying it. The following year we did a reading course together over portions of Gregory Naber's book *Topology, Geometry, and Gauge Fields*. In my senior year of college I met his wife Amber and they had me over to their house for pizza. (It felt like being invited to dinner with a movie star - I was so nervous I barely slept the night before.) He helped me get into grad school, and was always around to chat online through the ups and downs of my Ph.D. program. Since I moved back to Bloomington, we would run into each other and chat a little on campus from time to time, and one time we graded the M211 final together which was a lot of fun. He told me he was proud of me for finishing my Ph.D. and it meant the world to me. Our community has lost a wonderful person and I know I'm not the only one among us who feels the loss deeply. I will never forget him.

David Hoff: John had enormous love and respect for mathematical physics, reflected in the care and scholarliness he brought to his subject, evidenced in particular by the detailed and erudite response he wrote and circulated just a few days before his death to a mathematical query from a colleague. John was the last person I knew who carefully recorded ideas in notebooks, perfectly legibly, in complete sentences, in fountain pen!



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