2024 Oklahoma-Arkansas Newsletter

![MAA Mathematical Association of America logo and outline map of Oklahoma and Arkansas]
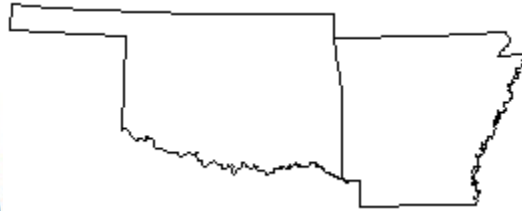
Department News

The following newsletter submissions were submitted to the communications director on or before March 31, 2024. If you would like to submit a summary of the fantastic things that your department and department members have been doing, contact csauer@cameron.edu.

Cameron University

Christopher Sauer

In the spring of 2023, Mr. **Christopher Sauer** and Ms. **Vicki Henson** (CU Veterans Affairs) hosted the 2023 CU Empowering Women in Leadership and Stem conference. The conference had over 80 student and community attendees and featured a keynote speech by Dr. **Angela Sivadon** (Tulsa Community College) focusing on how to work with colleagues of varying temperaments effectively. The conference also had a panel discussion featuring local women military, educational, and business leaders.

In January and February of 2024, Mr. **Christopher Sauer** and faculty from Cameron's Chemistry, Physics, Engineering, and Biology departments hosted five half-day STEM outreach events targeting low-income middle-school students. Two hundred and forty students participated.

Throughout 2023, **Dr. Ioannis Argyros** continued his prolific research output. He published 49 papers, three books, and he contributed four chapters to books a book authored by other colleagues. For a complete listing of his academic accomplishments, click here.

In 2023, **Dr. Hong Li** was promoted to Full Professor, and **Christopher Sauer** was promoted to Senior Instructor.

Northeastern State University

Martha Parrott

Student Recognition:

The Oklahoma DaVinci Institute DaVinci Scholar Award is designed to honor pre-service teachers whose academic accomplishments and service to the university are deemed most notable. Nominees will demonstrate the ability to integrate content into relevant applications through a service learning proposal. The proposal should exemplify scholarship, creativity, inventiveness, sound teaching techniques, and a keen sense of responsibility. Eligible applicants for this award must be in their final two years in a teacher preparation program. For 2023, Alessandra Criscione has been named a DaVinci Scholar. She plans to teach mathematics in secondary schools in Pryor, Oklahoma, upon graduation in spring 2024.   Alessandra is mentored by **Dr. Martha Parrott,** Professor of Mathematics and Director of NSU's Mathematics Center, where Alessandra is a Math Clinic teacher and mentor to other new teachers.

Mathematical Inquiry Project:

As part of the Mathematical Inquiry Project at Oklahoma State University, **Dr. Lucas Foster,** Associate Professor of Mathematics**, and Dr. Karl Kruczek,** Associate Professor of Mathematics, worked on a Collaborative Research and Development (CoRD) team project with Heather Lester at Connors State College and Susan Kirk at Tulsa Community College. The CoRD project aims to improve entry-level mathematics at Oklahoma colleges and universities. The project, "Productive Struggle, Persistence, and Perseverance," was recently published on the MIP website. Visit their website to learn more about this great research! Also supporting the Mathematical Inquiry Project 2023-2024 were NSU faculty **Mr. Austin Beard**, Instructor of Mathematics, and **Dr. Martha Parrott**, Professor of Mathematics.

Grant Awarded and Current Research:

National Science Foundation *Increasing and Inspiring Highly Effective Secondary STEM Teachers for High-Need, Culturally Diverse School Districts*

Dr. Martha Parrott (PI and Professor of Mathematics), **Dr. Spence Pilcher** (Co-PI and Professor of Chemistry), **Dr. Luke Foster** (Co-PI and Associate Professor of Mathematics), and **Dr. Stephan Sargent** (Co-PI and Professor of Reading) have been awarded a National Science Foundation grant to support the preparation of STEM majors who will prepare to teach middle school or high school mathematics or science. This program will provide much-needed scholarships and unique educational opportunities to prepare STEM teachers who will serve students in our high-need areas as well as our high percentage of socially disadvantaged minority students in the Oklahoma Reservation areas. NSU's Gregg Wadley College of Science and Health Professions has collaborated with the College of Education in the development of these program experiences. The intended award amount is $1,173,385 (Yr 1-5), with years 4 and 5

contingent upon availability of funding. Part of the team's research focuses on innovative ways to recruit and retain STEM majors who plan to teach in secondary schools.

Grants Awarded and Current Research (Cont.):

National Science Foundation *Investigation of Faculty Perceptions of Course-based Undergraduate Research Experiences and Barriers to Their Implementation*

Dr. Jessica Martin, PI and Professor of Chemistry, and **Dr. Martha Parrott**, Co-PI and Professor of Mathematics, have been awarded a National Science Foundation grant ($287,614) to support Course-based Undergraduate Research Experiences (CUREs). CUREs are learning experiences in which all students in a class address a research question or problem as a group. Students derive similar benefits from CUREs as traditional research experiences, such as increased self-efficacy, skills, and persistence. These experiential learning opportunities can introduce students to research earlier and are also more inclusive since every student can participate. The grant award will provide opportunities for faculty in all disciplines to learn about CURES. Additionally, our funding provides opportunities for faculty in NSF-fundable fields (natural sciences, mathematics, and computer science) to develop these exciting experiences for our students, who will have a chance to be paid to create a CURE in their courses. Part of their research focuses on faculty and student perceptions of course-based undergraduate research.

New Certificate Opportunities and Program Review:

Both the BS Mathematics program and M. Ed: Mathematics Education programs experienced successful OSRHE five-year program reviews during the fall 2023 semester. Led by **Dr. Lucas Foster,** Associate Professor of Mathematics, faculty in the program are currently developing an undergraduate certificate focusing on statistics. Faculty in the M. Ed. The Mathematics Education program continues to advance its graduate-level STEM Education Certificate opportunity in partnership with NSU's graduate program in science education.

Elimination of Zero-Level Mathematics Courses:

In accordance with new expectations by the Oklahoma State Regents for Higher Education, NSU will eliminate zero-level mathematics courses beginning with the fall 2024 semester.   Co-requisite labs will be available for all math pathway courses. Led by **Dr. Karl Kruczek**, Associate Professor of Mathematics, faculty in the program are collaborating to develop course support resources for each math pathway course to ensure student success, especially among students who formerly would have enrolled in zero-level mathematics courses.

Oklahoma Baptist University

Sarah Marsh

OBU is excited to launch two new BS in Applied Mathematics degree options in Fall 2024 to complement our existing BA, BS, and BSE options in Mathematics. The new degrees will feature emphases in Data Science and in Actuarial and Financial Math. We are thrilled about the opportunities this will open up for our students!
OBU's STEM Day has grown into an annual opportunity for local high school students to preview OBU's STEM offerings via multiple breakout sessions with OBU faculty and students. The Division of Mathematics collaborates with the Division of Science, the Office of Admissions, and many other faculty and administrators across campus to host several hundred students at this event each year!

In personnel news, Dr. **Sarah Marsh** was promoted to Professor during the 2022-23 academic year. Congratulations to Dr. Marsh!

Southern Nazarene University

Nicholas Zoller

In the Summer of 2023, **Dr. Nicholas Zoller** (department chair) supervised a research project for SNU student **Aydin Read**. Aydin used data collected by Frontier City amusement park staff to estimate wait times for most of the rides available. Although the model was not as powerful as they hoped, they enjoyed having an excuse to visit Frontier City for a day.

In the Fall of 2023, **Dr. Zoller** supervised the senior research project for **Karsten Hutcheson**. Karsten used the past five years of data from the NCAA Division I Football Bowl Subdivision (FBS) to develop a new model to predict team winning percentages. Among his several research findings, he discovered that teams traveling in one time zone usually performed worse than teams that traveled in two or more time zones. It is believed that teams in the latter group are more likely to spend more time preparing for those longer trips than teams in the former group.

In December 2023, SNU student **Basil Agboola** took the Putnam Exam. This was his first time taking the Putnam Exam, and the Math Department congratulated him on submitting solutions to four of the twelve problems.

In February 2024, SNU hosted the [sixteenth annual](#) Texas/Oklahoma Regional Undergraduate Symposium (TORUS). The Math Department welcomed dozens of faculty and students to our campus in Bethany for a day filled with invited speakers, student research talks, a career in math panel discussion, and a Math Jeopardy competition. We congratulate the team from

Oklahoma State University for their first-place finish in Math Jeopardy. We look forward to the next TORUS in February 2025 at Tarleton State University. TORUS is funded by NSF DMS Award # 2223745.

In March 2024, the Southern Nazarene University (SNU) Math Club celebrated Pi Day at the SNU Lab School with students in grades 5 - 8. Students made pi bracelets by choosing one color for each digit and stringing together the colors in the same order as the digits of pi. Students also estimated the value of pi by tossing toothpicks in the style of the famous Buffon experiment.

University of Arkansas

Matt Clay

PERSONNEL CHANGES:

Jiahui Chen joined our department in August 2023 as a tenure-track Assistant Professor. He received his Ph.D. in Computational and Applied Mathematics from Southern Methodist University and had a postdoctoral position at Michigan State University. His research uses machine learning and techniques from differential geometry to study the topological properties of data, which are often biological in nature. This semester, he is teaching a special topics course on machine learning.

Gennady Uraltsev joined our department in August 2023 as a tenure-track Assistant Professor. He earned his Ph.D. in Mathematics at the University of Bonn, Germany. In addition, he had visiting positions at Cornell University and the University of Virginia. Uraltsev's research interests are harmonic analysis, time-scale-frequency analysis, stochastic PDEs, and functional analysis. This year, he is teaching our Advanced Calculus sequence.

We had two new postdocs start last fall. **Kyle Maddox** earned his Ph.D. from the University of Missouri and also had a postdoctoral position at the University of Kansas. His research interests lie in commutative algebra, and he will be working primarily with **Lance Miller**. **Joshua Hudson** earned his Ph.D. from the University of Maryland-Baltimore County and had a postdoctoral position at Sandia National Laboratories. His research interests include fluid dynamics, inverse problems, data assimilation, and machine learning. He will be working primarily with **Zachary Bradshaw**.

Carlos Nicolas and **Virginia Parkman** both started as Teaching Assistant Professors in August 2023. Nicolas earned his Ph.D. from the University of Kentucky and has research interests in

combinatorics and discrete geometry. Parkman earned her Ph.D. from Florida State University and has research interests in mathematical biology.

Radwan Al Faouri and **Mohades Ross** both started as Instructors in August 2023. Al Faouri earned his Ph.D. in Physics from the University of Arkansas and was previously an Assistant Professor at the University of the Ozark in addition to teaching in our department as an adjunct. Ross holds a Masters degree from the University of Arkansas.

We had two retirements this last year. **Dennis Brewer** retired after 48 with the University of Arkansas, where he served in a large number of roles during his long career, including as a department chair of the Department of Computer Science, associate vice provost for research and economic development, director of research and sponsored programs, associate vice chancellor for information technology, and director of Information Technology Services. Most recently, he was the vice chair of our department.

Chaim Goodman-Strauss also retired last year after 29 years as a faculty member in our department, where he served as a department chair from 2008-2015. Goodman-Strauss, together with an interdisciplinary team of collaborators, announced a solution to a 50-year-old problem, proving that it is possible to tile a plane "aperiodically" with a single tile. The work has been discussed in the *New York Times* (March 28, June 3, 2023) and in *Nature* (June 1, 2023). He currently serves as the director of MOMATH, the National Museum of Mathematics in New York City.

There were several changes in leadership within our department as well. **Mark Johnson** completed his second term as chair of the department. **Matt Clay** is the current department chair, and Samantha Robinson is the vice chair.

ACHIEVEMENTS/EVENTS:

The 48th annual Spring Lecture Series in the Mathematical Sciences, "Transport, Mixing, and Fluids," was organized by Professors **Zachary Bradshaw** and **Ariel Barton** in May 2023. The principal lectures were given by Anna Mazzucato, Professor of Mathematics and Distinguished Senior Scholar of Penn State University, as well as talks from leading experts in the field. A public lecture, "Mathematical Models: a World of Insight," was given by Lisette de Pillis, Normal F. Sprague Professor of Life Sciences and Professor of Mathematics, Harvey Mudd College. The conference was supported by a grant from the NSF.

The Fall Redbud Topology Conference was hosted at the University of Arkansas in October 2023. It was locally organized by **Katherine Raoux**, **Sumeyra Sakalli**, and **Jeremy Van Horn-Morris.**

Tulin Kaman was awarded tenure and promoted to Associate Professor.

Patrick Phelps graduated with a Ph.D. in May 2023 and received a postdoctoral position at Temple University. His advisor was **Zachary Bradshaw.**

John Bergdall was awarded an NSF Grant. His project is titled "Slopes of modular forms and moduli stacks and Galois representations." He was also a recipient of the Robert C. and Sandra Connor Endowed Faculty Fellowship.

Zachary Bradshaw was awarded an NSF grant. His project is titled "Separation rates for dissipative nonlinear PDEs."

Tulin Kaman and four undergraduate students attended the BRING Math workshop which was held at the Argonne National Laboratories (ANL) on October 5-6. This workshop was organized and sponsored by the Institute for Mathematical and Statistical Innovation (IMSI).

University of Oklahoma

Nikola Petrova

RECENT ADDITIONS:

Dr. **Weinan Wang** has joined the department as a tenure-track Assistant Professor. He is an expert on nonlinear PDEs and their applications to kinetic theory, fluid dynamics, and magnetohydrodynamics. He earned an MS at the University of Kansas and a doctorate at the University of Southern California, and he held a postdoctoral position at the University of Arizona, with a semester spent at MSRI.

Dr. **Victor Bailey** is a new postdoc specializing in functional analysis and harmonic analysis, in particular, in frame theory. He earned MS and Ph.D. degrees from Georgia Tech. His mentor will be **Keri Kornelson**.

Dr. **Anuradha Ekanayake** joined us as a postdoc in the Geometry/Topology Group; he will be mentored by **Max Forester**. He holds a doctorate from the University of Pittsburgh. His area of research is low-dimensional topology and hyperbolic geometry.

Dr. **Lauren Grimley** is a postdoc jointly appointed in our department and the OU School of Computer Science. She earned a doctorate from Texas A&M in representation theory, and worked as an Assistant and Associate Professor at Spring Hill College (Mobile, AL).

Dr. **Roshini Gallage** is a new renewable term faculty (RTF). She holds MS and Ph.D. degrees from Southern Illinois University in nonlinear stochastic differential equations. She taught for a year at the Community College of Baltimore County.

Dr. **Dustin Gaskins** joined the department as an RTF. He holds a doctorate in differential geometry from our department.

Dr. **Ashley Berger** joined us as an RTF. She earned a Ph.D. in Mathematics at OU and worked as a lecturer at OU and an Assistant Professor at Oklahoma City University.

Haleigh Watson-Wilkes is a new RTF. She holds an M.Ed. in Mathematics from UT-Arlington and is pursuing a doctorate in Math Education at OU. She has worked for more than ten years as a middle- and high-school teacher and as an adjunct instructor.

PROMOTIONS, AWARDS, SPECIAL EVENTS:

Greg Muller and **Pengfei Zhang** were granted tenure and were promoted to Associate Professors.

Miloš Savić was promoted to Full Professor.

Our donor, **David Proctor,** received the OU Distinguished Service Award.

Alejandro Chávez-Domínguez received the prestigious Kinney-Sugg Outstanding Professor Award, given annually to one professor in the OU Dodge Family College of Arts and Sciences.

Jing Tao was awarded an NSF research grant for the project *Geometry and Topology of Surfaces and Graphs*.

Alejandro Chávez-Domínguez was awarded an NSF research grant for the project *Quantum Perspectives in Banach and Metric Spaces*.

Weinan Wang received an AIM SQuaRE grant.

The graduate students **Carlos Villanueva** (advisor **Pengfei Zhang**) and **Henry Carnick** received SMART (Science, Mathematics, and Research for Transformation) fellowships from the US Army.

Lucy Lifschitz retired after a 22-year career at OU. She earned a doctorate from Yale University and taught at the University of Bielefeld, the University of Virginia, and Tufts University prior to joining our department. She worked on geometric and measured group theory, lie groups, arithmetic groups, and other groups of geometric interest. She co-advised one Ph.D. student.

Jonathan Kujawa resigned to assume the position of the Chair of the Department of Mathematics at Oregon State University. He came to OU in 2007 and has since supervised the completion of seven Ph.D. students and mentored two postdocs. His research has received continuous extramural support since 2004. He has received the prestigious Irene Rothbaum Award and a Nancy Hester Presidential Professorship.

Our donors, **Conrad and Ellen Masterson,** established an endowed fellowship for our graduate students named after the OU Math professor **Thomas Hill,** who taught at OU from 1967 to 1993. Dr. Hill was Conrad's high school Math teacher.

Dr. **Dorothy Wong** established an endowed scholarship for our graduate students in memory of her father, Dr. **Ting-Kwan Pan**, a Math professor at OU from 1953 to 1975.

Our donors, **David and Judi Proctor,** established a new endowed scholarship for our graduate students.

The Redbud Topology Conference was held at OU on March 31 – April 2, 2023; the local organizers were **Noel Brady**, **Max Forester**, **Justin Malestein**, **Jing Tao**, and **Peter Patzt**. This conference series is co-organized by OU, OSU, and the University of Arkansas; the first such conference was held in November 2011 at the University of Arkansas.

The TORA XII Conference was held at OU on October 13, 2023, and was organized by **Kimball Martin** and **Ameya Pitale**. The conference series rotates between OU, OSU, and the University of North Texas (UNT). The first event was held in 2011 at UNT.

Our graduate students **Steven Lin**, **Ergun Suer**, **Ahmed Uzun**, **Arman Yagci**, and the Texas A&M graduate student **Jordy Lopez** organized the Graduate Algebra Symposium held at OU on November 4, 2023.

Our annual **Math Day**, held on November 9, 2023, was attended by 450 students. The Organizing Committee was chaired by András Lorincz. The invited lecture, *From Fibonacci to Fractals*, was delivered by **Sarah Koch** (University of Michigan).

Alex Grigo and **Ying Wang** organized the SIAM Central States Section Computational and Applied Math Forum featuring online talks given by prominent experts on applied mathematics.

The Southwest Local Algebra Meeting was held at OU on February 24-25, 2004. **Jonathan Kujawa** and **András Lorincz** were the local organizers.

The department now has a Chapter of the **Association for Women in Mathematics (AWM)**, with faculty sponsor Nick Miller. The chapter organized several invited talks and a career panel.

In Fall 2023, **Travis Mandel** and the undergraduate student **Keon Moradi** started a **Math Circle** for middle- and high-school students.