MATHEMATICS NEWSLETTER

THE UNIVERSITY OF ARIZONA
COLLEGE OF SCIENCE
Mathematics

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The Department of Mathematics
Newsletter 2025

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View from the Chair

By Doug Ulmer

Are we living in “interesting times”? I don’t think we are cursed, but we are certainly having to adapt to many changes and face a few challenges. Luckily, the mathematics community at Arizona is flexible, innovative, and united in our purpose of creating and communicating mathematics, the queen of the sciences.

AI and its impact on both teaching and research is an area of both challenge and opportunity. The department has convened two task forces to make practical recommendations about the use of AI in the classroom on one hand, and on how it might enable our work in research and graduate education on the other. We look forward to many practical insights coming toward the end of the fall semester.

We’re building capacity in other ways. For example, the estate of alumnus John Brown has established a new, $1M endowed scholarship for students interested in teaching mathematics in disadvantaged areas, and our Industrial Advisory Board held another very successful two-day meeting focused on mentoring and providing opportunities to undergrads, graduate students, and postdocs interested in industrial careers.

The department continues to engage with the community by hosting events to explain the beauty and impact of mathematics. The “Everything is Math” lecture series continued with a lecture by Professor Laura Miller on “Equations in Motion: Modeling horses and riders”. The Bartlett Memorial Lecture will be given on March 26th by Professor Jonathan Mattingly of Duke University on the very timely topic of gerrymandering. The College of Science Lecture Series (on “Today’s Science, Tomorrow’s World”) will include a lecture by Professor Lise-Marie Imbert-Gerard on “Mathematical Modelling to Advance Nuclear Fusion.” And of course we will host many high-profile research conferences such as the Arizona Winter School, Dynamics Days, and a meeting on equestrian biomechanics.

Several of our colleagues have been recognized with major awards. Professor Marta Civil is, as I write these lines, in Washington to be inducted into the National Academy of Education! Rodrigo Gutierrez and Ariel Biggs of CRR, the Center for the Recruitment and Retention of Mathematics Teachers, won Presidential Awards for Excellence in Mentoring and Teaching respectively. And Duncan Buell was named College of Science Alumnus of the year. Congratulations to all of them and to other award winners in the department.

We were happy to welcome several new colleagues in the fall, including Flora Lau in the Math Center, Kalysta Chase and Monet Medina in the Academic Office, and Gretchen Stickney as new co-director of CRR, as well as several new career-track faculty members: Ayak Chol, Uma Harjith, Lianfen Qian, Antony Pearson, and Adil Yousif. We are also hosting two members of the College of Science “Team 2” business support office in our building, namely Mario Calderon and Sonia Vega. Welcome to all the newcomers!

Congratulations to Professor Ning Hao, who was promoted to full professor, and Professor Xueying Tang, who was promoted to associate professor and granted tenure! Congratulations as well to Professor Emeritus Tom Kenedy who in retired in January after a long and distinguished career of teaching, advising, and research in mathematical physics.

Thanks to everyone in our extended community for your interest and support. We hope you will stay in touch, and we wish you all the best for the coming year.

Doug Ulmer’s research emphasizes fundamental curiosity-driven problems in number theory and algebraic geometry. Doug enjoys building academic programs and institutions with lasting impact.

Contact him at: ulmer@arizona.edu

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Learn More

Mathematics in Motion: Measuring How Music Changes a Horse's Gait

By Laura A. Miller

Next semester, Spring of 2026, I'll teach a new Course-Based Undergraduate Research Experience (CURE) in horse biomechanics at the University of Arizona Al-Marah Equine Center off Bear Canyon Road in northeast Tucson. In this course, students will measure how music affects the gaits and heart rate of horses. Students will collect data, analyze it, and use mathematical models to describe how horses respond to rhythm and tempo.

CUREs are designed to bring authentic research into the classroom. Instead of repeating textbook experiments, students design their own studies, troubleshoot problems, and contribute to a growing body of new knowledge. They experience what it means to do mathematics and science, not just study it. This CURE is supported by a new university-wide initiative to make research accessible to more undergraduates. This class is also part of a broader project funded by the Provost Investment Fund that links mathematics, engineering, and animal science through hands-on learning.

At the center of this course are the horses themselves. Each student team will be paired with one horse and will use inertial sensors and high-speed video to measure movement at the walk, trot, and canter. They'll test how different types of music—slow, fast, instrumental, or percussive—change stride length, regularity, and symmetry. We want to know whether horses entrain to rhythm the same way people sometimes do, whether tempo influences movement, or whether certain sounds help a horse relax. Students will learn to calculate gait symmetry and regularity from their data. They'll explore simple mathematical models that describe the relationship between stride and heartbeat—systems of coupled oscillators that can drift apart or fall into sync. They'll also learn to visualize these dynamics, turning abstract equations into real motion.

This work builds on years of effort to develop authentic research courses across campus. With support from the Provost Investment Fund, faculty at U of A are building a network of CUREs that give students from every background the opportunity to participate in real scientific discovery. At Al-Marah, those discoveries happen in an arena, surrounded by horses, music, and data. This project also fits naturally within the University of Arizona's land-grant mission. It connects mathematics to agriculture, veterinary science, and animal welfare while opening new research pathways for students who might not otherwise

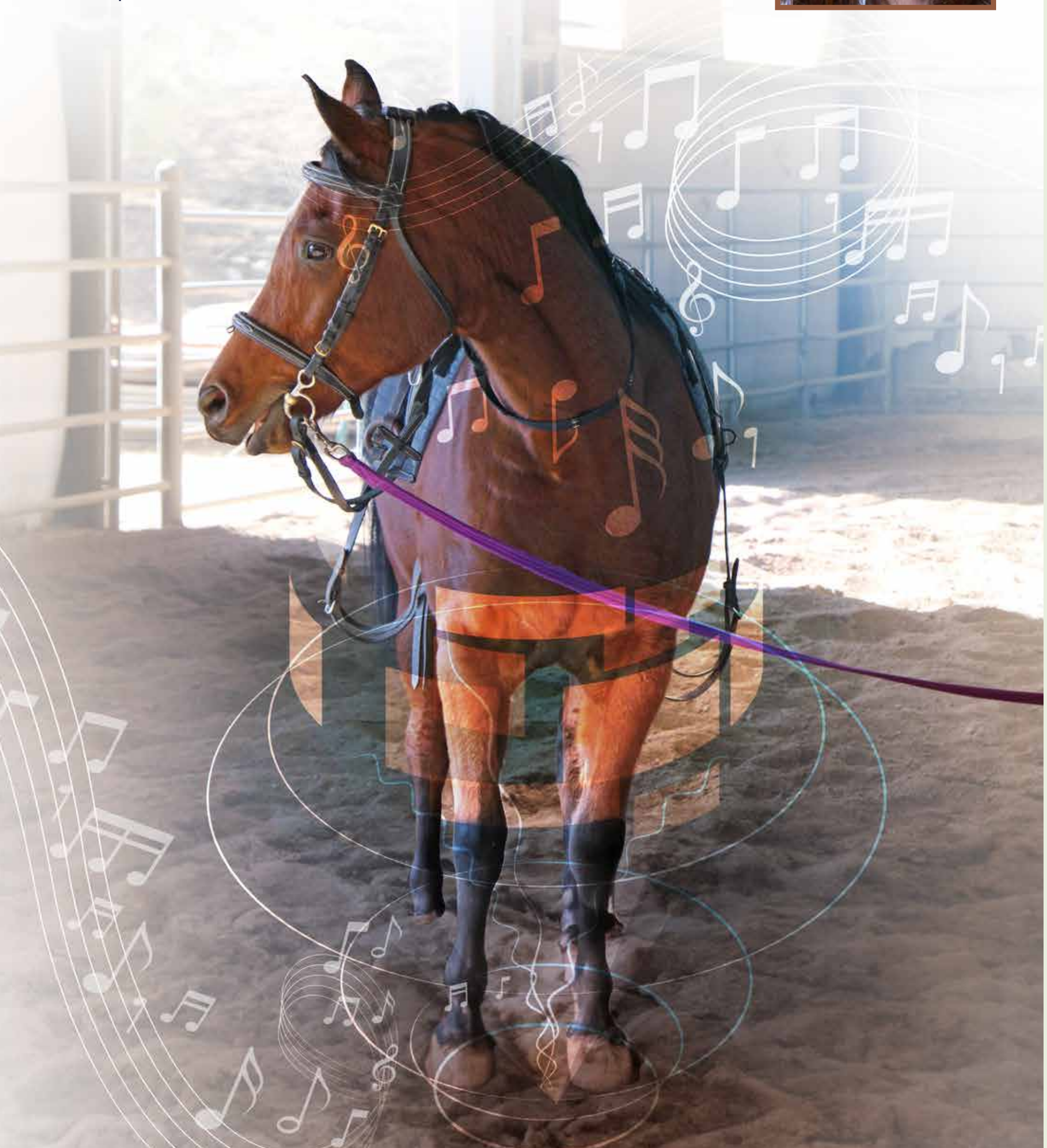
At the center of this course are the horses themselves. Each student team will be paired with one horse and will use inertial sensors and high-speed video to measure movement at the walk, trot, and canter.

see themselves in STEM. Horses attract a very different population than most math classes. The majority of equine professionals are women, and many Hispanic and Indigenous students are deeply connected to equine traditions in their cultures. By linking mathematics to horses, we can bring new voices into mathematics, science, and engineering.

The class will run like a research group. Each week, students will give short progress updates and share their data. They'll document their work in an online lab notebook, analyze results, and present their findings at the end of the term to trainers, veterinarians, and other professionals. Every group will leave with results they've generated and interpreted themselves.

Mathematics often feels abstract until you can see it move. When a horse's stride locks into rhythm with a piece of music, you can watch phase synchronization unfold right in front of you. You can see symmetry, frequency, and feedback—not in a diagram, but in motion. That's the kind of moment we want students to experience: when math stops being something written on a board and becomes something living, breathing, and moving beside you.◀

Laura A. Miller is Professor of Mathematics and Joint Professor of Animal and Comparative Biomedical Sciences and Biomedical Engineering at the University of Arizona. Her research combines mathematical modeling, biomechanics, and animal movement. She leads the Systems Biomechanics of the Horse project and directs the university's Provost-funded Equine Biomechanics CURE at the Al-Marah Equine Center.



BIOGRAPHIES

Global Faculty

Adil Yousif's research interests lie within time series predictive models using NNW. He earned his PhD in Math Edu at Ohio University in 1997. He has taught intensive courses in probability at Columbia and was the founder and director of the Data Sciences Center in KU, Sudan in 2023. He has also been a statistical consultant and data analyst since 1997.

Instructional Faculty

Ayak Chol is originally from South Sudan and has lived in the United States since 2001. He has over 18 years of teaching experience, primarily at 2-year and 4-year colleges. Chol earned a B.S. in Mathematics from the University of Arizona, with a minor in Physics, and an M.S. in Mathematics from Emporia State University. His research interests focus on biostatistics, particularly the design and analysis of clinical trials. Outside of academics, Chol enjoys sports and playing card games.

Lianfen Qian earned her Ph.D. in Statistics from Michigan State University after an M.S. and B.S. in Mathematics from Zhejiang University, China. She was Professor of Data Analytics at Lynn University and spent 20+ years at Florida Atlantic University, including Associate Dean of Science. Her research spans structural changes in time series, survival, financial, environmental, and genomic data. A dedicated educator, she has guided many students, including the 2015 ASA/CAUSE competition winner.

Postdoctoral Research Associates

Jinyue Luo grew up in Jiangxi, in southeastern China known for its flavorful and spicy cuisine. She received her Ph.D. in mathematics from the University of Chicago. Her research focuses on number theory, particularly Galois representations and Galois deformation rings. Outside of mathematics, Jinyue enjoys crocheting, baking sweets, playing video games, and reading comics.

Biographies continued on page 10.

What Your Eyes Tell Your Brain

By Kevin K. Lin

"Seeing is believing," as the saying goes, and indeed vision plays such a central and integrated role in how we perceive and interact with the world that we seldom stop to think about it (except when something goes wrong). But what exactly happens in the brain when we look out with our eyes? In what follows I would like to describe a tiny piece of this puzzle and a bit of the subtle and rich dynamics that goes along with it.

The visual pathway (Fig. 1) begins when light enters the eyes, hitting light-sensitive photoreceptor cells in the retina. This signal, by way of various intermediaries, eventually arrives in the lateral geniculate nucleus (LGN) (a part of the thalamus, deep within the brain) then on to the primary visual cortex (V1). V1 is part of the cerebral cortex, a thin sheet of tissue forming the outermost layer of the brains of mammals. The cortex is the substrate for many cognitive functions, and V1 is the first and largest cortical area devoted to vision. Each neuron along the visual pathway has a receptive field (RF), a small spot on the retina from which they receive stimuli. The RFs of visual neurons, in turn, cover the retina — much like the grid of sensors in a digital camera, though far less regular.

Neurons convey information through electrical impulses called "action potentials" or spikes. In the absence of visual input, cortical neurons along the visual pathway typically hum spontaneously and irregularly at a low rate. When a stimulus arrives, they respond by changing their firing rate (the average number of spikes per second): some cells spike much more, some a lot less. In analyzing trains of spikes recorded from neurons, one often begins by studying their firing rates under different conditions, though it's well known that precise spike timing often carry significant information.

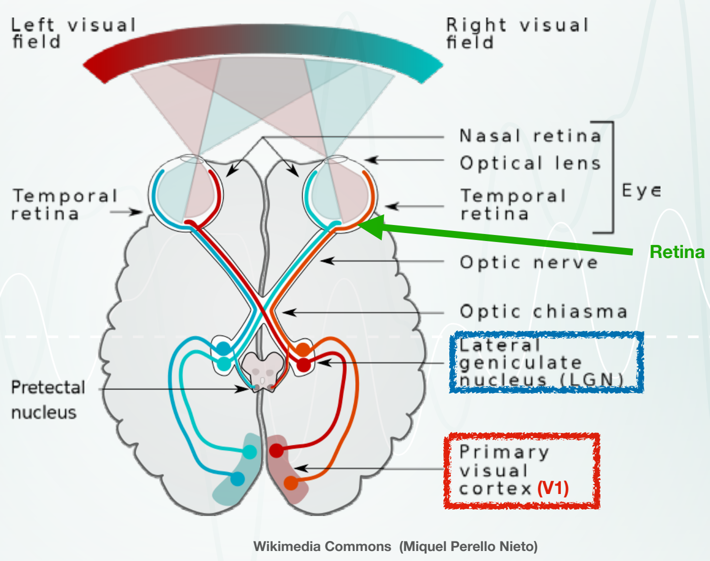


Figure 1: The visual pathway, by Miquel Perello Nieto, licensed under the Creative Commons Attribution-Share Alike 4.0 International license.

There are two types of LGN cells: so-called “on-center” cells respond to a spot of light near the center of its RF by spiking vigorously; “off-center” cells do the opposite. A key feature of LGN cells is that they are insensitive to the orientation of the stimulus: their response only depends on the intensity of light falling on their RFs, and remains roughly the same when an image is rotated while keeping stimulus intensity constant. Hubel and Wiesel, pioneering visual physiologists, found that in contrast, most V1 cells fire vigorously when edges enter their RFs, with firing rates that depend sensitively on the edge’s orientation; see Fig. 2A. This phenomenon of orientation selectivity is a salient feature of V1. Though a classic finding, how this works in detail still holds surprises. In particular, Hubel and Wiesel had proposed a model in which each V1 cell receives inputs from two rows of LGN cells, one entirely on-center and the other off-center (Fig. 2A). Such connectivity could potentially explain how LGN cells — with their orientation-agnostic response — convey orientation information to V1. However, LGN cells have the same firing rate for all edge orientations. How is orientation actually encoded?

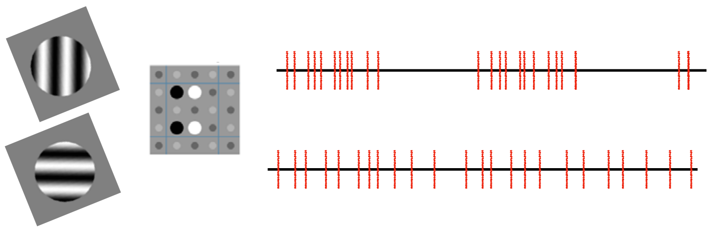


Figure 2A: Pooled LGN spike input into V1 cells. Above: preferred (vertical) orientation leads to bursty input. Below: orthogonal (horizontal) orientation leads to uniform input. This is Figure 1C from Z-C Xiao, K K Lin, and L-S Young, PNAS 121 (2024).

This conundrum was observed, and resolved, by mathematicians L. Chariker and L.-S. Young and neurobiologist R. Shapley[1]. The answer is that while different edge orientations lead to the same mean firing rates, they elicit different spike patterns. Fig. 2A (top) shows an example of a vertical-preferring V1 cell: a vertical edge in its RF leads to “constructive interference” between its incoming LGN spikes, leading to synchronous volleys of incoming spikes. A perpendicular edge (Fig. 2A, bottom), in contrast, leads to a steady but slower stream of spikes. Because of the way the neurons respond to incoming spikes, the bursty pattern in A leads to higher mean firing rates in V1, even though spike trains A and B have the same mean rates.

In addition to this insight, the Chariker-Shapley-Young collaboration (joined later by neurobiologist M. Hawken) has produced a strikingly accurate and comprehensive model of V1, able to account for orientation selectivity and a host of other phenomena. However, their model entails simulating individual neurons, and computational expenses limited their model to a cortical patch about 1.5mm (or 0.75°) on a side — big enough for some nontrivial visual phenomena (e.g., the moon spans ≈ 0.5°), but not enough for many phenomena of interest.

I have been working with UA Applied Math alum Zhuo-Cheng Xiao (now at New York University – Shanghai) and former UA faculty Lai-Sang Young (Courant Institute, NYU) to reduce the footprint of these models while retaining valuable biological information. We use a technique from an area of physics called mean field (MF) theory to construct simplified, or “reduced,” models[2]. Originally developed to understand the alignment of atomic spins in magnets, MF ideas are useful for modeling large, complex networks made of relatively simple parts. MF techniques were introduced to neuroscience by Knight[3] and by Wilson and Cowan[4], and have been part of the toolkit of mathematical neuroscientists due to the insights they provide into generic neuronal networks. Our contribution is to show that with careful attention to relevant neurobiology, MF models can accurately model specific systems like V1. We do this by subdividing V1 into small blocks called “pixels” and treating the neurons in each pixel as essentially indistinguishable. Instead of hundreds of thousands of neurons, our model has about a thousand pixels, dramatically reducing complexity and computational cost, with results that are comparable (Figs. 2B and 2C). Much work remains, both to extend the scope of MF in neurobiology and to explain why it works.

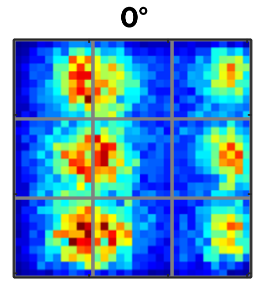


Figure 2B: Response of spiking neuron model to vertical grating. This is Figure 7A from L. Chariker, R. Shapley, L.-S. Young, J Vision 20 (2020), licensed under the Creative Commons Attribution 4.0 International License.

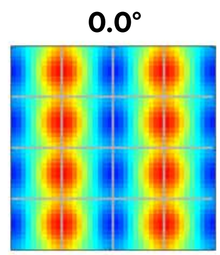


Figure 2C: Response of coarse-grained model to vertical input. This is Figure 4A from Z-C Xiao, K K Lin, and L-S Young, PNAS 121 (2024).

I hope I have managed to convey some of the reasons why I find computational neuroscience — the field that studies questions like these (and more) — to be a fun and exciting area. For those interested in learning more, I highly recommend Lettvin et al.[5] (from which I “borrowed” my title) and Hubel[6], both as entry points to visual neurobiology and as examples of excellent scientific writing. The field has advanced tremendously, but these classics remain well worth reading.

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Kevin K. Lin joined the University of Arizona in 2007. His research centers around nonlinear dynamics, scientific computing, and applications.

Contact him at: lin1@arizona.edu

National Honors

By McKenzie Meza

U of A Mathematics Professor Marta Civil Elected to National Academy of Education - Among Other Honors

Mathematics Professor Marta Civil received 2 highly distinguished honors this year in the world of mathematics education. Most notably, she was among a small number of education leaders elected to the National Academy of Education.

In addition, Marta also received the Distinguished Scholar Award of the Special Interest Group for Research in Mathematics Education (SIG/RME) in the American Educational Research Association. This award "recognizes and celebrates the programmatic research of a distinguished scholar within the field of mathematics education".

"These awards signify a recognition of my journey, which builds on the work of great mentors I had and is also reflected in the work of those I have mentored over the years," Marta shared, "It is also a tribute to the many teachers, students, and families with whom I have had the honor to work over my career. I have learned so much from them!"

With a goal of improving learning opportunities, Marta's research argues that all students, regardless of background, have rich mathematics experiences and it is our duty to understand and build on these experiences. Her most well-known area of research relates to the development of a scholarly agenda centered on parental engagement in mathematics.

The Department of Mathematics here at the University of Arizona works to give faculty like Marta the freedom to pursue research that interests them most. "It is quite unique to think of a mathematics department as a setting where one can pursue a sociocultural, community-based mathematics education research agenda," Marta noted.

When asked about advice for those new to research in Mathematics Education, Marta said, "Follow what you are passionate about and not necessarily what is 'trendy'. You have to enjoy what you are doing. For me, that joy comes from the work I have done with the children, their families, and teachers over the years."

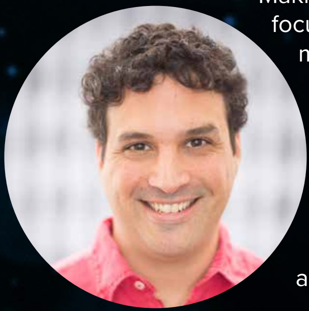
Congratulations once again on these extraordinary honors, Marta.

Contact Marta at: martac@arizona.edu

CRR Staff Receive National Honors

Two University of Arizona Department of Mathematics members were recognized with 2 of the nation's highest honors for their contributions to mathematics, science, education, and mentorship. The Presidential Awards for Excellence in Mathematics and Science Teaching and Mentoring are administered by the U.S. National Science Foundation (NSF) on behalf of the White House Office of Science and Technology Policy. These awards highlight the department's dedication to outreach for K-12 mathematics educators and students.

Congratulations to Rodrigo Gutiérrez and Ariel Beggs from the Center of Recruitment and Retention of Mathematics Teachers (CRR) on receiving these prestigious awards. "The CRR at the University of Arizona is working to attract, develop, and support mathematics teachers through innovative programs, retaining high quality teachers in mathematics education." (https://crr.math.arizona.edu)



Dr. Rodrigo Gutiérrez, director of the CRR, received the Presidential Award for Excellence in Science, Mathematics and Engineering Mentoring. The award recognizes his commitment to guiding students and mentoring teachers to advance excellence in math, science, technology, and engineering fields. His professional and research pursuits focus on teacher development, mathematics education, and teaching for social justice, with a particular emphasis on supporting Latinx learners and emergent bilinguals who are learning English while strengthening their first language.

Ariel Beggs, a program coordinator for the CRR and mathematics educator, received the Presidential Award for Excellence in Mathematics and Science Teaching. Reflecting her many years of experience in the classroom, the award recognizes Ariel's efforts to create learning environments in which students can explore their identity, belonging, and agency as confident problem solvers. She leads the Making Manipulatives Make Sense (MMMS) series, which focuses on using manipulatives to concretize abstract mathematical concepts for learners.

"This honor highlights the CRR's mission in action by supporting teachers who build student agency, strengthen mathematics education, and create classrooms where curiosity thrives," Ariel shared, "It reflects what is possible when educators are empowered with community, professional learning, and a shared vision for excellence."

Congratulations Rodrigo and Ariel!

Follow the CRR on social media: @UArizonaCRR

Contact Ariel at abeggs@arizona.edu and Rodrigo at rodrigog@arizona.edu.

2026 DANIEL BARTLETT MEMORIAL LECTURE

THE UNIVERSITY OF ARIZONA DEPARTMENT OF MATHEMATICS PRESENTS

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JONATHAN MATTINGLY

Thursday, March 26, 2026 | 6:30 PM

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Dessert and hosted bar reception in the ENR2 Cafe following the lecture.

MORE INFO: **math.arizona.edu/bartlett**

THE UNIVERSITY OF ARIZONA

Biographies continued from page 5.

Staff

Mario Calderon is the Business and Finance Manager for College of Science, Business Services Team II, and the team leader for the six-person Business Office. He is a Tucson native with over 21 years of financial operations experience at the University of Arizona, and Veteran of the United State Marine Corps Reserve. He is excited to lead this team and looks forward to working with everyone within the departments that his team supports.

Kalysta Chase is part of the administration staff in room 108. She was previously in the Air Force in an Administrative Support role. She just came to the U of A after working a bit at Trader Joe's. Clearly she really enjoys customer service. Right now she is finishing a Bachelor's Degree in Information Science with a goal of starting an Accelerated Master's Program in Library Science. Always dreaming big.

Flora Lau grew up in Hong Kong and began her U of A journey as a Cantonese instructor. She has extensive experience working with international populations and now advises students on the main campus. In her free time, she enjoys painting with acrylics, dancing, reading, gardening, and sneaking in naps whenever her young kids allow. She doesn't know how to swim but she loves the ocean and treasures laughter and good conversations.

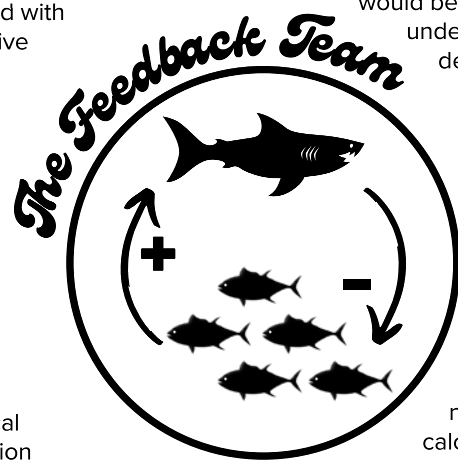
Monet Ormsby provides administrative support in the Academic Office, working alongside the wonderful team in Room 108. After 10+ years in the DC area working in marketing and real estate, she moved back home to Tucson in summer 2025 for a fresh start. In her spare time, she loves trying new restaurants and cafés, traveling, and enjoying the outdoors.

Biographies continued on page 11.

A Modern Calculus Approach for Modern Biology: Math 119A

By Tynan Lazarus

For decades, calculus textbooks marketed to biology majors have been a thin veneer covering a more traditional physics or engineering focused approach. In all the previous times that I have taught a biology focused calculus course, you could swap out the biology context of a related rates or optimization problem and not change the procedures of the problem. But if you ask a modern-day biologist what mathematics they need to complete their work, they do not respond with memorized derivative rules or integration techniques. What they tell us is that they need nonlinear differential equations to be able to model predator-prey relationships, or they need to use a computer to help model the dynamical systems of population dynamics, or vector fields to be able to describe any oscillatory behavior. In Math 119A, we have begun to modernize our approach, focusing more on how the mathematics fits into the biology rather than trying to force a biological scenario onto a mathematical problem.



Nearly 20 years ago, UCLA pioneered a different approach to calculus that is geared towards actually preparing students in the biological sciences for their future careers. The textbook, Modeling Life, is written by a cardiologist and an ecologist, both of whom are active in the modeling community. Hand computations are de-emphasized, but modeling with a computer is elevated. Our Department of Mathematics adopted the course in 2019, and we have steadily been increasing enrollment and interest. Students use a more geometric point of view to approach challenging mathematical and biological concepts. We use visuals to discuss change in a system rather than computing derivatives by hand, leverage coding to create vector fields and bifurcation diagrams to better understand real biological systems and data. The homework uses real data from local sources, like the University of Arizona Canine Cognition Center, and the pharmacokinetics of how antivenom drugs bind to the venom from a rattlesnake bite using data from a local hospital.

One may be skeptical that a student coming from Math 112, College Algebra, would be able to learn and understand at a truly deep level how differential equations work without a background in precalculus and calculus, but that is the beauty in approaching the content from a more visual perspective. Rather than getting bogged down in notation and hand calculations, students use graphs, diagrams, and computers to simulate the dynamics of their models. By tweaking parameters in their code, they learn about bifurcations and the onset of oscillations. They explore dynamic equilibria and see how feedback loops describe natural phenomena better than static equilibria of the traditional mathematical models.

> *"Math119A (calculus) was the first time I ever learned how to enjoy math. It transformed my attitude and my aptitude for the subject."*

The fact that the situations they are modeling come from their own majors and from similar classes means that the students have fun doing math. Some examples of comments we often hear in the course reviews are:

“I REALLY liked this course. I enjoyed taking a more conceptual approach to mathematics, and focusing on things such as trends, behaviors of models and whatnot, rather than the normal plug-and-chug model for mathematics.”

“I like how this course tried to pertain calculus to the real world and to biology. It makes the content more relevant to my other courses.”

In fact, one student’s response to the National Survey of Student Engagement (NSSE) was shared from the university level as an example of how the math department is affecting students across the campus:

“Math119A (calculus) was the first time I ever learned how to enjoy math. It transformed my attitude and my aptitude for the subject. I credit this to the professor(s) who encouraged curiosity and exploration more than a perfect score. Without those professors, I would still feel terrible about math. Changed my academic life dramatically.”

Math 119A students feel better about their learning, and they are performing better. The number of students who do not pass the course is around 20% lower than in our traditional calculus class Math 122A/B. We have more demand for the course than we can keep up with because the biology departments continually push their students to take 119A instead of courses with a more traditional mathematical approach.

We have been active in the national movement to adopt this style of course. Since so few universities have adopted a course like this, we communicate our successes across the country in an attempt to inspire more departments to take up this course. In the summer of 2023, my colleague Samantha Kao and I attended a workshop at Harvard designed to spread the word about the successes we have seen alongside UCLA. We continue to collaborate with our colleagues at other institutions like UCLA, UCSC, Harvard, Utah State, and Texas State, and I have presented our approach at conferences like the Symposium on Biomathematics & Ecology Education & Research.

While it has been daunting for me as someone trained in pure mathematics to learn so much biology and applied math, it has been so fun and rewarding. The class is a joy to teach because of all the people involved. We have included both career track and tenure track colleagues, graduate students from pure and applied math, and undergraduate learning assistants that were recruited directly from the class itself. The students are bright, interested, participatory, and kind, which gives me hope for these future doctors, physicians, and pharmacists. I feel better knowing that these students got to see modern and powerful mathematics before they leave U of A, and better yet, it’s the kind of mathematics they will actually see as healthcare professionals.

Tynan Lazarus is a Lecturer in Mathematics. He joined the department in 2019 after finishing his PhD from UC Davis where he studied fractal geometry.

Contact Tynan at tlazarus@arizona.edu.

Biographies continued from page 10.

Gretchen Stickney is the new Director of the CRR at the U of A. Gretchen has 29 years of experience in mathematics education, has taught both middle and high school math, and has served as an instructional coach and district-level leader. Gretchen is honored to lead efforts that ensure every student has access to a highly effective math teacher. In her free time, Gretchen enjoys baking, hiking, pickleball, playing games with her family, and traveling!

Sonia Vega is a Grant and Contract Administrator with the College of Science Business Services Center, Team II, and provides post-award support primarily for the Math Department research faculty as well as ad hoc support for Computer Science and Physics research faculty.

Rather than getting bogged down in notation and hand calculations, students use graphs, diagrams, and computers to simulate the dynamics of their models.

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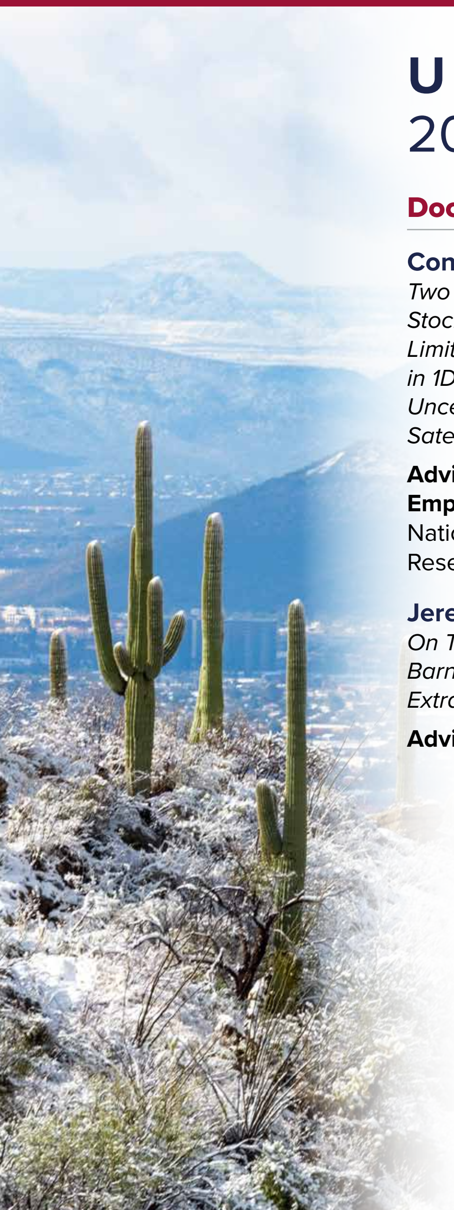

U of A Mathematics
2025 Master's and Ph.D. recipients

Doctoral degrees

Connor Hatton
Two Problems in Applied Stochastic Processes: Scaling Limits of the Multiple Range in 1D Random Walk and Uncertainty Quantification in Satellite Imagery.
Advisor: Sunder Sethuraman
Employer/Position: Oak Ridge National Laboratory/Postdoctoral Research Associate

Jeremy Roberts
On Twisted Group Algebras of Barnes-Wall Lattices and Their Extraspecial Automorphisms
Advisor: Christopher Keller

Duncan Bennett
Computer-Assisted Proofs of Chaos in Long Short-Term Memory Models.
Advisor: Marek Rychlik

Thomas Harris
Each ALH Tesseron from Doubly Periodic Monopoles.*
Advisor: Sergey Cherkis

Gaurish Korpal
Supersingular Curves in Cryptography.
Advisor: Craig Costello
Co-Advisor: Kirti Joshi

John Park
Spectral Clustering with the Degree-Corrected Laplacian.
Advisor: Ning Hao

Master's degrees

Pavel Chumarov
Advisor: Serin Hong

William Chuang
Advisor: David Glickenstein

Jonah Robert Garner
Advisor: C. Douglas Haessig

Christopher Martin Mount
Boundary Behavior for Sticky Brownian Motion
Advisor: Ibrahim Fatukullin

Karaline Petty
Advisor: Aditya Adiredja

Maxwell Thum
Advisor: Patrick Shipman

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