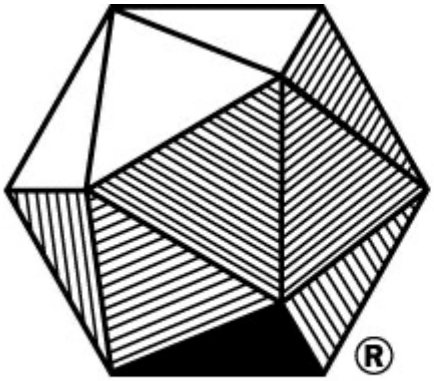

MAA

MATHEMATICAL ASSOCIATION OF AMERICA

87th Annual Meeting
of the
Oklahoma – Arkansas Section

Hosted by
The University of Arkansas at Little Rock
April 9 – 11, 2026

MAA Core Interests:
Education
Research
Professional Development
Public Policy
Public Appreciation

OK-AR Section Website
http://sections.maa.org/okar

Executive Committee
2025 – 2026

Ron Smith (HU), Chair
Jeanine Myers (ATU), Chair-Elect
Kyle Barker (UALR), Local Program Chair
Cherith Tucker (OKBU), Interim Local Program Chair-Elect
Sarah Marsh (OKBU), Secretary
Kristi Karber (UCO), Treasurer
Kayla Murray (UAFS), Section Representative
Tom McNamara (SWOSU), Communications Director

Abbreviations for Institutions Represented in this Program Book

ATU	Arkansas Tech University
BC	Babson College
ECU	East Central University
HU	Harding University
ISU	Iowa State University
JBU	John Brown University
NSU	Northeastern State University
OCCC	Oklahoma City Community College
OKBU	Oklahoma Baptist University
OKCU	Oklahoma City University
OKWU	Oklahoma Wesleyan University
OSU	Oklahoma State University
PNNL	Pacific Northwest National Laboratory
SAU	Southern Arkansas University
SEOSU	Southeastern Oklahoma State University
SWOSU	Southwestern Oklahoma State University
TSU	Truman State University
TU	University of Tulsa
UA	University of Arkansas
UAFS	University of Arkansas – Fort Smith
UALR	University of Arkansas at Little Rock
UAM	University of Arkansas at Monticello
UCA	University of Central Arkansas
UCO	University of Central Oklahoma
UD	University of Delaware

2026 Meeting Overview

All times Central Daylight Time

Thursday, April 9

4:00 pm – 8:00 pm	Registration and Check-in, EIT First Floor
4:30 pm	Section NExT, ETAS 480
6:00 pm – 8:30 pm	Team Jeopardy Competition, ETAS 406 / 409
8:30 pm	Integration Bee, ETAS 406

Friday, April 10

8:00 am – 3:00 pm	Registration and Check-in, EIT First Floor
9:00 am – 11:30 am	Student Workshop, ETAS 483
	What color is my hat?
	Warren Shull, University of Arkansas
9:00 am – 11:30 am	Faculty Workshop, ETAS 480
	Career Readiness for Students … and Faculty.
	Rick Cleary, Babson College, MAA Vice President
11:45 am – 1:00 pm	Department Chairs Lunch, ETAS 406
	Faculty Sponsors Lunch, ETAS 409
	Section NExT Lunch, ETAS 482
1:00 pm – 3:15 pm	Presented Papers, Sessions 1-8
	ETAS 406, 409, 478, 480
3:15 pm – 3:40 pm	Break, ETAS 481
3:45 pm – 4:45 pm	Section Visitor Lecture, EIT Auditorium
	Fraud Detection with Benford's Law.
	Rick Cleary, Babson College, MAA Vice President
4:50 pm – 5:50 pm	Executive Committee Meeting, EIT 203
6:00 pm – 7:30 pm	Banquet, Donaghey Student Center, Ledbetter Rooms
7:45 pm – 8:45 pm	MAA NAM Lecture, EIT Auditorium
	Changing Directions: Building a Unique Career within and outside of Mathematics.
	Brett Jefferson, Pacific Northwest National Laboratory

Saturday, April 11

8:00 am – 10:00 am	Registration and Check-in, EIT First Floor
8:30 am – 9:05 am	Presented Papers, Sessions 9-11
	ETAS 406, 409, 478
9:15 am – 10:25 am	Section Business Meeting, ETAS 406
10:30 am – 11:25 am	Presented Papers, Sessions 12-15
	ETAS 406, 409, 478, 480

Full Meeting Schedule

Thursday Evening, April 9, 2026

4:00 pm – 8:00 pm **Registration and Check-in**, EIT First Floor
4:30 pm **Section NExT**, ETAS 480
6:00 pm – 8:30 pm **Team Jeopardy Competition**, ETAS 406 / 409
Presiding: Scott McClendon (UCO)
8:30 pm **Integration Bee**, ETAS 406

Friday Morning, April 10, 2026

8:00 am – 3:00 pm **Registration and Check-in**, EIT First Floor

9:00 am – 11:30 am **Student Workshop**, ETAS 483
What color is my hat?
Warren Shull, University of Arkansas
Description: If you're wearing a hat, you can't see what color it is. But if you have a team of players with different hats on, they can see each other's hats. We will play a game (or two or more) in which a team of players must strategize on guessing the colors of their own hats. Once the rules are explained, you can try to come up with a strategy, and then we will see if it works! After trying it out, we will discuss the math behind the solution.

9:00 am – 11:30 am **Faculty Workshop**, ETAS 480
Career Readiness for Students … and Faculty.
Rick Cleary, Babson College, MAA Vice President
Description: Connecting mathematics faculty to opportunities in business, industry and government (BIG) positions is a great way to ensure that our subject stays relevant and our students are career ready. However, many academic mathematicians feel uneasy about how to make connections that will be fruitful for all parties. In this hands-on workshop, we will discuss several ways for departments to get started on this important work. We will focus on three C's:

- Communication: What can we learn from employers in the BIG sector? How can we prepare out students to be "workforce ready" while maintaining the intellectual vitality of mathematics?
- Curriculum: What should we be teaching? How should we be teaching it? Can we maintain some mathematical rigor while also encouraging computational and experimental results?
- Consulting: Can we form cooperative arrangements with BIG entities, perhaps in our geographic area, or remotely through shared interests? What resources are available to help math departments help others while helping themselves?

Friday Lunch, April 10, 2026

11:45 am – 1:00 pm **Department Chairs Lunch**, ETAS 406
Faculty Sponsors Lunch, ETAS 409
Section NExT Lunch, ETAS 482

Friday Afternoon, April 10, 2026
Presented Papers
1:00 pm – 3:15 pm

Session 1: Undergraduate Presentations, 1:00 – 2:35 pm, *ETAS 406*
Presiding: Cherith Tucker (OKBU)

1:00 - 1:15 pm **Generating Permutation Groups with the Overlap Theorem**
James Blalack (JBU)
Abstract: It is intuitively apparent that the set of all transpositions in Sn generates all of Sn and that the set of all 3-cycles in An generates all of An. This fact is the basis for a standard method of identifying whether a group is Sn or An. Since the number of transpositions and 3-cycles grows factorially as n increases, this method is inefficient. We provide a series of results, the Overlap Theorem, which aim to create a more efficient method of manually calculating if a group is Sn or An.

1:20 - 1:35 pm **Modeling the Electrolytic Microenvironment of Human Blood with Systems of Equations**
Samuel Paez (JBU)
Abstract: Biomedical research depends on modeling physiological conditions in the laboratory; yet, especially with ions, this is challenging due to their unique concentrations. This work uses systems of linear equations to simulate the electrolytic microenvironment of human blood, creating a novel, versatile method for preparing a buffer. It provides valuable flexibility for the good administration of chemical inventories and allows for new exciting studies on the dynamics of the circulatory system.

1:40 - 1:55 pm **Binding to Breakdown: Multiscale Kinetics of Clot Lysis**
Austin Segrest (UCO)
Mentor: Brittany Bannish
Abstract: Blood clots are composed of fibrin fibers that are degraded in a process called fibrinolysis that involves tissue plasminogen activator (tPA). This study uses a multiscale stochastic model to examine how variation in the binding rates of tPA to fibrin affects degradation of the clot. By systematically varying the rates, we quantify the percent of fibers remaining over time and clarify how binding affinity regulates fibrinolysis. Results of this study inform thrombolytic optimization.

2:00 - 2:15 pm **From Virus to Viral Meme: Comparing COVID-19 and 6_7 Meme Using SIR Model**
Kshitiz Khatiwada (UAM)
Mentor: Lynn Fox
Abstract: This research project applies the classical SIR Model to Covid-19 case data and the recent viral meme "6 7". By estimating transmission and recovery rate, I compared their epidemics curve and demonstrate the biological contagion and digital virality follow strikingly similar mathematical dynamics. The results show how differential equation can model both disease spread and information difussion, highlighting the broader impact of rapidly spreading content on human behavior.

2:20 - 2:35 pm **Catan And Math**
Camden Wilmes (ECU)
Mentor: Nicholas Jacob
Abstract: Using the game of Catan, we will be exploring strategies new and old through the use of linear programming and operations research.

Session 2: Undergraduate Presentations, 1:00 – 2:15 pm, *ETAS 409*
Presiding: Jeanine Myers (ATU)

~~**1:00 - 1:15 pm**~~ ~~**What Makes a YouTube Video Viral?**~~
~~Maci Hodges (UAFS)~~
~~**Mentor**: Rachel Lehman, Chizuko Iwaki, Kayla Murray~~
~~**Abstract**: The rapid growth of YouTube has transformed the platform into one of the most influential forms of media use. Interaction in the form of views, likes, comments, and subscribers tells us that user participation and consistency have a major impact on virality. My study explores five different channels across five genres on YouTube, tracking the number of views, likes, comments, and subscribers over a four-month period. This data seeks to find out how these metrics contribute to the virality of a channel on YouTube.~~

1:20 - 1:35 pm **Oversampling Algorithms for Archetype-Preserving Data Summarization**
Auri Davis (UCO)
Mentor: Tyler Cook, Emily Hendryx Lyons
Abstract: Low-rank approximations provide a way to summarize large data matrices while preserving key matrix properties. Standard subset selection methods use a rank-k approximation to select up to k representative rows or columns from the matrix itself. Oversampling algorithms that operate on lower-rank approximations offer a more practical alternative in large data sets. This research evaluates these oversampling methods and assesses their effectiveness in preserving archetypal data points.

1:40 - 1:55 pm **A Novel Algorithm to Efficiently Compute Collatz Heights**
Saxon Rowland (SEOSU)
Abstract: In this presentation, I will describe a dynamic programming approach to computing the Collatz Heights of integers within a given range. By constructing a lookup table to contain specific information built from samples within the desired range, the total amount of steps required to verify the Collatz Height of a range of integers is drastically reduced. This algorithm has proven useful in verifying that specific long sequences of consecutive integers have the same Collatz Height.

2:00 - 2:15 pm **Permutations of the 4D Rubik's Cube**
Collin Bazzell (OSU)
Mentor: Lisa Mantini
Abstract: In the 1970s, Erno Rubik designed his iconic Cube. The puzzle is famous in popular culture, and there exist extensive writings and fascinating mathematical results about it. In 1988, undeterred by constraints of reality, Don Hatch and Melinda Green developed a computer application simulating a 4-dimensional analog of Rubik's Cube. We will introduce this 4D puzzle, give an overview of what deeper analysis of the puzzle involves, and summarize a few results.

Session 3: Number Theory and Analysis, 1:00 – 1:55 pm, *ETAS 480*
Presiding: Sudan Xing (UALR)

~~**1:00 - 1:15 pm**~~ ~~**Ivan Niven's Elementary Proof of the Irrationality of Pi**~~
~~Fred Worth (OKWU)~~
~~**Abstract**: In 1947, Ivan Niven published a "simple proof" of the irrationality of Pi. It appeared in the Bulletin of the AMS. We will run through his proof.~~

~~**1:20 - 1:35 pm**~~ ~~**Bernoulli Numbers**~~
~~Tom McNamara (SWOSU)~~
~~**Abstract**: We examine sums of powers. Our goal is to find closed form expressions for these sums. Looking for patterns in these formulas lead to the Bernoulli numbers.~~

1:40 - 1:55 pm **Orlicz Projection Bodies for Lipschitz star bodies**
Sudan Xing (UALR)
Abstract: In this talk, we introduce a higher-order Orlicz projection operator for Lipschitz star bodies, extending recent developments from convex bodies to a significantly broader, potentially nonconvex setting. We establish that this operator is well-defined, affine invariant, and continuous under natural geometric convergence. As a main result, we present a higher-order Orlicz--Petty projection inequality and show that origin-symmetric ellipsoids are the unique maximizers under suitable conditions.

Session 4: Mathematics Education and Classroom Notes, 1:00 – 2:15 pm, *ETAS 478*
Presiding: Matt Hester (UALR)

1:00 - 1:15 pm **Teaching Gateway Courses: Lessons Learned from Teaching Algebra-Based Non-Majors College Physics**
Chris Oehrlein (OCCC)
Abstract: Are we teaching the right way in our Functions/College Algebra courses to prepare our students for the physical sciences and chemistry courses many of them must take? The presenter will share what he has noticed while teaching an introductory physics course for non-majors, mostly students entering the health professions. He will also share slight changes he has made to his Precalculus and Modeling with Functions classes as a result of his experience as a physics professor.

1:20 - 1:35 pm **Corequisite Mathematics in Transition: UCO's Applied Algebra Redesign**
Alana McAnally (UCO)
Abstract: This presentation provides a brief overview of the University of Central Oklahoma's redesigned Corequisite Applied Algebra course in response to recent state-mandated changes in developmental education. The talk will examine how the Applied Algebra course has been updated to meet these requirements while continuing to support underprepared students. It will highlight curricular restructuring, targeted just-in-time remediation, embedded support strategies, and instructional innovations designed to address gaps in foundational skills within a reduced support framework. Attention will be given to strategies for maintaining academic rigor, improving student persistence, and promoting equitable outcomes despite the loss of extended remediation time.

1:40 - 1:55 pm **Rethinking Nursing Dosage Calculations**
Erin Williams (UCO), Crystal Westmorland (UCO)
Abstract: Dosage Calculation is an important concept for nursing students and one that many struggle with. Nursing textbooks and classes generally present dosage calculation problems in a formulaic manner, while mathematicians see these as a unit conversion problem. Within two sections of a High Acuity Nursing course, we administered a pre-test focusing on dosage calculation problems. Students were then divided into two groups, one being led by a nursing professor and one by a mathematics professor, where supplemental instruction was given for dosage calculations. After this additional instructional time, a post-test was completed by all students. In this talk we will describe the methods used for each group, discuss the pre- and post-tests, present the raw data that was obtained, and discuss our continuing/future plans of study.

2:00 - 2:15 pm **Six Fascinating Triangular Structures: Patterns and Connections Across Mathematics**
Lianfang Lu (UALR), Annie Childers (UALR)
Abstract: This session explores six fascinating mathematical structures: Pascal's Triangle, the Chinese (Yang Hui) Triangle, the Harmonic Triangle, the Prime Number Triangle, the Golden Triangle, and Pascal's Pyramid. These mathematically rich structures offer meaningful learning opportunities from middle school through high school and into higher education. We will examine the history, generation, similarities, differences, and underlying patterns of each structure. Through these explorations, connections will be made to number sets, algebra, geometry, probability, number sense, and calculus. This session highlights how simple triangular and pyramidal arrangements reveal deep mathematical relationships and promote conceptual understanding across multiple areas of mathematics.

Session 5: Applied Mathematics and Modeling, 2:00 – 3:15 pm, *ETAS 480*
Presiding: Hong Cheng (SAU)

2:00 - 2:15 pm **Existence of Traveling Waves in a Predator-Prey Invasion Model with Nonlocal Dispersal and Delayed Effects in Dispersal**
Kyle Barker (UALR), Austin Simms (UALR*)
Abstract: This paper establishes the existence of traveling wave solutions in a Leslie-Gower predator-prey model featuring nonlocal dispersal and multiple time delays in both diffusion and reaction terms. The model captures realistic ecological effects such as spatial movement and delayed species responses. Due to the competitive nature of the interaction, the reaction terms satisfy only a partial monotonicity condition. We establish the existence of traveling waves. This is done by construction of upper and lower solutions and developing an iterative scheme whose convergence is ensured by Schauder's fixed point theorem. The approach is extended to accommodate a relaxed class of super and sub-solutions. Explicit examples, and numerical illustrations are provided.

2:20 - 2:35 pm **Monotone Traveling Waves in a General Discrete Model for Populations with k-generation Long-Term Memory**
Austin Sanders (UALR)
Mentor: Kyle Barker (UALR)
Abstract: We establish the existence of monotone traveling waves for a general discrete population model incorporating k-generation long-term memory. Extending the integrodifference framework of Alzahrani and Barker (2023), our model accounts for discrete dispersal, continuous kernels, and local linear effects across multiple past states. We prove the evolution operator preserves monotonicity and order. Using linearization near the zero state, we derive characteristic equations to determine spreading speed bounds.

2:40 - 2:55 pm **Agent-based model of branching actin networks**
Brittany Bannish (UCO)
Abstract: Actin, the most abundant protein in cells, is involved in key cellular functions including cell motility and muscle contraction. We present an agent-based model of branching actin networks to investigate the microscale mechanisms that produce different branched structures. Our goal is to create a tool that can be used to discover the molecular interactions that produce the wide variety of actin network configurations associated with normal development as well as pathological conditions such as cancer.

3:00 - 3:15 pm **Loss Functions: The Mathematics Behind Machine Learning**
Hong Cheng (SAU)
Abstract: Loss functions are central to machine learning, transforming prediction tasks into mathematical optimization problems. This talk examines loss functions from a mathematical perspective, beginning with classical L2 and L1 losses and their convexity and geometric interpretations. We then discuss binary cross-entropy and its connection to maximum likelihood estimation and Kullback–Leibler divergence. For structured prediction tasks such as object detection and image segmentation, we introduce Dice and Intersection-over-Union losses, which measure region overlap rather than pointwise error. Finally, we highlight geometry- and topology-aware approaches, including Wasserstein distance and persistent homology metrics, illustrating how loss design shapes learning behavior.

Session 6: Mathematics Education and Educational Technology, 2:20 – 3:15 pm, *ETAS 409*
Presiding: Kailey Perry (NSU)

2:20 - 2:35 pm **When AI Writes the Math: Lessons from Using Chat GPT in Complex Analysis**
Jeanine Myers (ATU), Joy Skaggs (ATU)
Abstract: An upper-division Complex Analysis course was taught using an OER textbook with Chat GPT generating homework, guided notes, and assessments. While AI improved efficiency and customization, issues of clarity, accuracy, and student trust emerged. This presentation shares the instructor's lessons learned and features a student co-presenter offering firsthand insight into students' perceptions of AI-generated course materials.

2:40 - 2:55 pm **Supporting Elementary Students' Mathematical Modeling Processes Through Interactive Technology**
Azin Sanjari (UCA)
Abstract: This study examines how integrating Code.org activities into elementary mathematics classrooms supports students' mathematical modeling processes. By engaging students in structured coding tasks, we explore how algorithmic thinking, pattern recognition, and problem decomposition enhance conceptual understanding, representation, and iterative reasoning during modeling tasks.

3:00 - 3:15 pm **Experience with switching to Open Educational Resources (OER)**
Kailey Perry (NSU)
Abstract: In the 2025-26 year, my colleagues at NSU and I switched multiple courses to Open Educational Resources. I will discuss choices of textbooks and experience with the Oklahoma State Regents for Higher Education OER grant. I will also discuss altering the setup of the class to accompany the OER, and student feedback.

Session 7: Statistics and Probability, 2:20 – 3:15 pm, *ETAS 478*
Presiding: Wei Zhang (UALR)

2:20 - 2:35 pm **Bias-Robust Bayesian Reassessment of Nutrition Randomized-Trial Meta-Analyses**
Matt Hester (UALR)
Abstract: In this paper, we conduct a bias-robust Bayesian reanalysis of widely cited published nutrition randomized-trial meta-analyses by refitting their extracted effect-size datasets under a model-averaged framework (RoBMA). Holding each original meta-analytic construction fixed, we treat published metaanalyses as evidence-making objects and evaluate how evidential conclusions shift when heterogeneity and selective reporting are modeled jointly.

2:40 - 2:55 pm **Toward a Distribution-Theoretic Foundation for Outlier Detection**
Jie Zhou (SAU)
Abstract: Outlier detection methods based on distributional transformations, such as CDF-based ranking and tail-probability scoring, are widely used but often lack clear theoretical justification. This work develops a distribution-theoretic perspective that interprets outlier detection as mapping observations into probability space, where extremeness is defined through distributional ordering rather than geometric distance. By formalizing CDF-based scoring within an empirical process framework, we establish invariance properties, ranking stability, and conditions under which such procedures are statistically valid, providing theoretical support for a broad class of distribution-based detectors.

3:00 - 3:15 pm **Survival among US adults with post-cancer-diagnosis cigarette smoking cessation**
Wei Zhang (UALR)
Abstract: This retrospective cohort study examined the association between smoking cessation after cancer diagnosis and survival among 8,120 adult cancer survivors from the 2000–2018 National Health Interview Survey linked mortality files. Using propensity score weighting and survival analysis, quitting smoking within 3 years of diagnosis was associated with longer median survival (4 additional years) and lower mortality risk (MHR 0.86; 95% CI, 0.76–0.98). Benefits were greater for cancers with high 5-year survival (>74%), with 7 additional years of median survival and reduced mortality (MHR 0.79). Survival benefits were also observed for lung, breast, and prostate cancers.

Session 8: Topology, 2:40 – 3:15 pm, *ETAS 406*
Presiding: Matthew Lynam (ECU)

~~**2:40 - 2:55 pm** **Introduction to Geometric Deep Learning**~~
~~Marquis Armwood (OKCU)~~
~~**Abstract**: We will describe some of the main mathematical ideas behind geometric deep learning and provide implementation details for some applications.~~

3:00 - 3:15 pm **An Interesting Example from Dimension Theory**
Matthew Lynam (ECU)
Abstract: In this talk we will look at some basic notions in Topological Dimension Theory and then see an interesting example.

Friday Afternoon, April 10, 2026
Break
ETAS 481
3:15 pm – 3:40 pm

Friday Afternoon, April 10, 2026
MAA Section Visitor Lecture
EIT Auditorium
3:45 pm – 4:45 pm

Fraud Detection with Benford's Law

Rick Cleary
Babson College
MAA Vice President

Presiding: Ron Smith (HU)

Abstract: There are many ways to connect traditional mathematics topics to important modern applications. These connections can help mathematics majors be prepared to enter careers in many fields, particularly data science. In this talk, we present an example of this type of connection by discussing applications of Benford's Law. This is a surprisingly simple discrete probability distribution that has proven to be useful in various fields, particularly fraud detection in accounting. This is a wonderful example of theory preceding practice as the distribution was known for decades before the applications were implemented.

About the Speaker: Rick Cleary teaches at Babson College where he is Professor of Mathematics and Statistics and Weissman family Professor of Business Analytics. He has previously taught at Bentley University, Harvard University, Cornell University and St. Michael's College. He works as an applied statistician in various fields, with recent publications related to sports, fraud detection in accounting, measuring creativity in business students, and biomechanics. Rick is the Vice-President of the Mathematical Association of America, and serves as first editor of a new journal, Scatterplot, that debuted in 2024 with a goal of helping mathematics teachers prepare students for careers in data science. He has athletic experience as a runner (including 32 Boston marathons), a high school and college cross country coach, a race director and a youth sports coach in soccer, basketball and baseball.

Friday Evening, April 10, 2026
Banquet
Donaghey Student Center, Ledbetter Rooms
6:00 pm – 7:30 pm

Friday Evening, April 10, 2026
MAA NAM Lecture
EIT Auditorium
7:45 pm – 8:45 pm

Changing Directions: Building a Unique Career within and outside of Mathematics

Brett Jefferson
Pacific Northwest National Laboratory

Presiding: Ron Smith (HU)

Abstract: This talk will discuss non-academic career paths with a background or degree in mathematics. I'll have heavy emphasis on what a career at a national laboratory is like and also touch on themes of navigating graduate school, being black in the mathematical sciences, and the value of work-life balance.

About the Speaker: Dr. Brett Jefferson is a senior data scientist and team lead of the Human Factors and Interactions team at Pacific Northwest National Laboratory. He joined PNNL in 2018 after graduating from Indiana University's Mathematical Psychology Laboratory. In his work, Brett focuses on studying patterns in complex data sets. Predominantly using topology, Brett maps patterns in data to observable and actionable behaviors from humans. By understanding these relationships Brett uncovers not only insight into human cognition, but also interesting mathematical constructions.

In addition to his technical work at PNNL, Brett also serves on the board of directors for the National Association of Mathematicians, Inc. NAM has a 50+ year history of support underrepresented groups in their mathematics education and career with a focus on African Americans. Brett began his second term in 2024.

Saturday Morning, April 11, 2026

8:00 – 10:00 am **Registration and Check-in**, EIT First Floor

Saturday Morning, April 11, 2026
Presented Papers
8:30 – 9:05 am

Session 9: Discrete Mathematics and Graph Theory, 8:30 – 9:05 am, *ETAS 478*
Presiding: Lisa Mantini (OSU)

8:30 - 8:45 am **Improved Bounds on the Rainbow Turán Numbers for Short Brooms**
Kanchana Gamlath (SAU), John Byrne (UD), Anastasia Halfpap (TSU), Sydney Miyasaki (ISU), Alex Parker (ISU)
Abstract: We study the rainbow Turán number, which asks for the maximum number of edges in a properly edge-colored graph that avoids a rainbow copy of a fixed graph. Our focus is on a family of trees called short brooms, obtained by subdividing one edge of a star twice. We improve previously known upper bounds for nearly all parameter values and provide asymptotically sharp constructions in several cases. Interestingly, the extremal behavior depends on the divisibility properties of the number of edges in the broom.

8:50 - 9:05 am **Symmetry and Modular Origami**
Lisa Mantini (OSU)
Abstract: In this talk, we'll discuss how to construct individual modules in order to create symmetrically colored models of some interesting solids. The combinatorics of the colorings leads to an action of a group of permutations.

Session 10: Applied Mathematics and Modeling, 8:30 – 9:05 am, *ETAS 409*
Presiding: Emily Hendryx Lyons (UCO)

8:30 - 8:45 am **FibriNet: A Mechanochemical Simulation Tool for Discovering Strain Dependent Fibrinolysis Dynamics**
Kamal Mandava (UCO)
Mentor: Brittany Bannish (UCO)
Abstract: Blood clot dissolution depends on plasmin cleaving fibrin fibers, yet how mechanical strain influences this process remains unclear. FibriNet couples fiber level polymer mechanics with Agent Based enzymatic cleavage to systematically investigate this relationship across a network. The model tests multiple strain cleavage hypotheses rather than assuming one, offering a computational complement to experimental fibrinolysis assays.

8:50 - 9:05 am **Electrocardiogram Summarization with Different Beat Segmentations**
Rabina Karki (UCO)
Mentor: Emily Hendryx Lyons (UCO)
Abstract: Detecting representative heartbeat morphologies can help summarize electrocardiogram (ECG) signals for subsequent analysis. In this research, we examine the impact of signal segmentation in selecting a subset of representative beats using the discrete empirical interpolation method (DEIM). We evaluate DEIM's performance with matrices formed using a variety of segment lengths. This research provides insight regarding the role of ECG segmentation for more effective DEIM subset selection.

Session 11: Recreational and Historical Mathematics, 8:30 – 9:05 am, *ETAS 406*
Presiding: Andrew Wells (ECU)

8:30 - 8:45 am **An Introduction to Circle Tic-Tac-Toe**
Michelle Lastrina (ECU)
Abstract: In this talk, we introduce a circle board version of the classic two-player game tic-tac-toe. We will describe some variations and their conditions for winning. We then explore such questions as: Does one player have an advantage? Is there a winning strategy? Can the game end in a draw? This talk is appropriate for anyone interested in games or recreational mathematics.

8:50 - 9:05 am **Pythagoras: Man, Myth, and Math**
Andrew Wells (ECU)
Abstract: Pythagoras is one of the most recognized names in mathematics due to the theorem bearing his name. Despite this, few people know anything about him. Even among mathematicians, there is a wide variety of stories and perspectives of varying degrees of certainty. This talk will cover some of what we know about the historical Pythagoras and what stories are popular, but unlikely.

Saturday Morning, April 11, 2026
Section Business Meeting
9:15 – 10:25 am
ETAS 406

Presiding: Ron Smith (HU)

Saturday Morning, April 11, 2026
Presented Papers
10:30 – 11:25 am

Session 12: Algebra, 10:30 – 11:25 am, *ETAS 409*
Presiding: Nathan Drake (OKBU)

10:30 - 10:45 am **The word problem for one-relation Adian inverse semigroups: new developments**
Muhammad Inam (SAU)
Abstract: The word problem for Adian inverse semigroups is an open research question. This talk encompasses some of the previous, and the recent developments on the word problem for one-relation Adian inverse semigroups.

10:50 - 11:05 am **Four Algebraic Proofs of the FTA**
Franklin Kemp ((Co)Sine Clock Company)
Abstract: 1. L. F. Kemp Rational FTA Proof, No IVT; 1/14/2026 verified by Google AI.
2. Real polynomials have conjugate complex roots.
3. E. W. Weisstein (2003), Gerolamo Cardano's (1501-1576) Formulae and Trigonometric Solution of a cubic.
4. W. K. Clifford (1870) cubic divided by $x^2 - ax - b$ via J. J. Sylvester's (1814-1897) Dialytic Method solves for a or b.

11:10 - 11:25 am **The Finite Field of EvenQuads**
David Wright (OSU)
Abstract: In 2006, M. Mills modelled the Game of SET as the finite field of order 81 so that SETs are collections of 3 distinct elements *x, y, z* such that $x + y + z = 0$ and conversely. Mills showed the subgroup of the 20 nonzero 4th powers is a maximum cap, meaning a largest possible collection of SET cards that does not contain a SET. In this talk, we model the newer game of EvenQuads as the finite field of order 64 so that QUADs are the collections of 4 distinct elements *w, x, y, z* such that $w + x + y + z = 0$. We show the subgroup of 9 nonzero 7th powers is a maximum cap, that is, a largest collection of EvenQuad cards containing no QUAD.

Session 13: Mathematics Education and Classroom Notes, 10:30 – 11:25 am, *ETAS 406*
Presiding: Britney Hopkins (UCO)

10:30 - 10:45 am **Steeping in Math Conversations: A Shift from Office Hours to Tea Time**
Emily Hendryx Lyons (UCO)
Abstract: This talk describes an effort to lower some of the barriers to student office-hour engagement in mathematics courses. Shifting from the more traditional format, "office hours" are now held in the form of "Tea Time" away from the instructor's office and with snacks (and, of course, tea). The presenter will discuss the motivation and inspiration toward making this change, logistical considerations, observations and perceived outcomes, and ideas for potential modifications and/or adaptations.

~~**10:50 - 11:05 am**~~ ~~**Tiger Tutoring**~~
~~Mary Harper (ECU), Nancy McClain (ECU)~~
~~**Abstract**: Throughout the last decade plus, there has been an increase in requests for help with math in the K12 age group. This seemingly coincides with the drastic shortage of certified mathematics teachers nationwide as well as gaps in math content skills left by Covid.~~
~~We decided to try to address this need by offering tutoring in a variety of modalities.~~
~~The talk will address all aspects of this endeavor.~~

11:10 - 11:25 am **Improving Success in Calculus 1**
Britney Hopkins (UCO)
Abstract: In 2015, the Department of Mathematics and Statistics at UCO set out to drop the DFW and improve student success in Calculus 1. In this talk we will take a look back at how this process has evolved over the past decade. We will outline each of the initiatives that were implemented and discuss how the multi-year effort finally did produce a drop in DFW rates.

Session 14: Mathematics Education and Classroom Notes, 10:30 – 11:25 am, *ETAS 478*
Presiding: Natalie Farrell (TU)

~~**10:30 - 10:45 am**~~ ~~**A newspaper project for a quantitative reasoning course**~~
~~Fred Worth (OKWU)~~
~~**Abstract**: One selling point for a quantitative reasoning course is that it REALLY is useful in daily life (unlike when we lie to students about college algebra being useful). This project helps illustrates that and helps make students find those applications.~~

10:50 - 11:05 am **Using Origami Constructions to Support Conceptual Understanding of Special Right Triangles in Trigonometric Functions for Precalculus**
Trang Tran (OSU)
Mentor: Lisa Mantini (OSU)
Abstract: This study investigates whether origami-based construction of special right triangles promotes deeper reasoning about side-length ratios and exact trigonometric values. By engaging precalculus students in hands-on geometric modeling, the project examines how physical construction can strengthen connections to symbolic reasoning and support durable conceptual understanding.

11:10 - 11:25 am **Exploring Mathematical Problem-Solving Behaviors**
Natalie Farrell (TU)
Mentor: Kimberly Adams (TU), Amy Schachle (TU)
Abstract: This study examines student reasoning and collaboration across ten problem-solving labs in a Calculus II course. Students worked in groups on integration, differential equations, power series, and graphical analysis of parametric and polar functions. Morning sections showed stronger individual skills, while afternoon sections demonstrated more consistent collaboration. Groups that verbalized reasoning and addressed misconceptions performed best. Structured activities, such as card matching, improved conceptual understanding.

Session 15: Applied Mathematics and Modeling, 10:30 – 11:05 am, *ETAS 480*
Presiding: Kyle Barker (UALR)

10:30 - 10:45 am **A graph-aided electrostatic solver**
Maria Fernanda Mayorga Echeverria (UA)
Mentor: Jiahui Chen (UA)
Abstract: The purpose of this project is to develop an alternative model for electrostatic analyses that matches the accuracy of the Poisson-Boltzmann equation but offers significantly lower computational costs, faster execution, and greater adaptability. Using the generalized Born model (a faster alternative that often sacrifices accuracy) and graph neural networks, which mirror atomic structures, this project aims to deliver accurate, efficient, and scalable predictions of molecular electrostatics.

~~**10:50 - 11:05 am** **Mathematical Modeling of Infectious Disease Dynamics Using SIR and SIRS Frameworks.**~~
~~Anjuman Ara Rashid (UA)~~
~~**Mentor**: Zachary Bradshaw (UA)~~
~~**Abstract**: This project studies the dynamics of infectious diseases using compartmental epidemiological models. We examine the classical SIR model and its extension, the SIRS model with temporary immunity, to understand how diseases spread within a population. Using systems of nonlinear differential equations, key parameters such as the basic reproduction number, are analyzed to determine conditions leading to disease eradication, endemic persistence, or recurrent outbreaks. Numerical simulations illustrate the evolution of susceptible, infected, and recovered groups under different parameter settings. Applications to diseases such as influenza and dengue highlight how incorporating temporary immunity allows the SIRS model to capture recurring epidemic patterns more realistically.~~

11:10 - 11:25 am **A Model of an Online Social Network (OSN)**
Joie Lea Murorunkwere (UALR)
Mentor: Eric Kaufmann (UALR)
Abstract: We introduce a new epidemic framework to model the adoption and abandonment dynamics of users (SPIR) on online social networks (OSN), emphasis on the novel compartment pauci-engaged. Pauci-engaged individuals have been exposed to an invitation to OSN, but remain undecided about joining, reflecting real-world hesitation. Building on the infectious–recovery dynamics studied by Chen, Kong, and Wang [5], we derive the basic reproduction number R_0 and establish threshold conditions for the stability of both the user-free and a unique user-prevailing. Jacobian and Lyapunov functions show that when $R_0 < 1$ leads to fade-out, while $R_0 > 1$ yield sustained engagement. Findings highlight the decision-making phase as a key lever for recruitment and retention strategies in coexisting OSNs.

Schedule of Presented Papers by Time of Presentation

Explanation of Column Headings:

- *Name*: Last name of first presenter
- *Title*: Title of presentation
- *Room*: Room Number
- *Session*: Session Number. Abstracts of presentations are given in the program arranged by session. Sessions of undergraduate presenters are identified by *UG*.

Friday Afternoon, April 10

1:00 – 1:15 pm

Name	*Title*	Room	Session
Blalack	*Generating Permutation Groups with the Overlap Theorem*	ETAS 406	UG1
~~Hodges~~	~~*What Makes a YouTube Video Viral?*~~	~~ETAS 409~~	~~UG2~~
~~Worth~~	~~*Ivan Niven's Elementary Proof of the Irrationality of Pi*~~	~~ETAS 480~~	~~3~~
Oehrlein	*Teaching Gateway Courses: Lessons Learned from Teaching Algebra-Based Non-Majors College Physics*	ETAS 478	4

1:20 – 1:35 pm

Name	*Title*	Room	Session
Paez	*Modeling the Electrolytic Microenvironment of Human Blood with Systems of Equations*	ETAS 406	UG1
Davis	*Oversampling Algorithms for Archetype-Preserving Data Summarization*	ETAS 409	UG2
~~McNamara~~	~~*Bernoulli Numbers*~~	~~ETAS 480~~	~~3~~
McAnally	*Corequisite Mathematics in Transition: UCO's Applied Algebra Redesign*	ETAS 478	4

1:40 – 1:55 pm

Name	*Title*	Room	Session
Segrest	*Binding to Breakdown: Multiscale Kinetics of Clot Lysis*	ETAS 406	UG1
Rowland	*A Novel Algorithm to Efficiently Compute Collatz Heights*	ETAS 409	UG2
Xing	*Orlicz Projection Bodies for Lipschitz star bodies*	ETAS 480	3
Williams, Westmorland	*Rethinking Nursing Dosage Calculations*	ETAS 478	4

2:00 – 2:15 pm

Name	*Title*	Room	Session
Khatiwada	*From Virus to Viral Meme: Comparing COVID-19 and 6_7 Meme Using SIR Model*	ETAS 406	UG1
Bazzell	*Permutations of the 4D Rubik's Cube*	ETAS 409	UG2
Barker, Simms	*Existence of Traveling Waves in a Predator-Prey Invasion Model with Nonlocal Dispersal and Delayed Effects in Dispersal*	ETAS 480	5
Lu, Childers	*Six Fascinating Triangular Structures: Patterns and Connections Across Mathematics*	ETAS 478	4

Friday Afternoon, April 10, continued

2:20 – 2:35 pm

Name	*Title*	Room	Session
Wilmes	*Catan and Math*	ETAS 406	UG1
Myers, Skaggs	*When AI Writes the Math: Lessons from Using Chat GPT in Complex Analysis*	ETAS 409	6
Sanders	*Monotone Traveling Waves in a General Discrete Model for Populations with k-generation Long-Term Memory*	ETAS 480	5
Hester	*Bias-Robust Bayesian Reassessment of Nutrition Randomized-Trial Meta-Analyses*	ETAS 478	7

2:40 – 2:55 pm

Name	*Title*	Room	Session
~~Armwood~~	~~*Introduction to Geometric Deep Learning*~~	~~ETAS 406~~	~~8~~
Sanjari	*Supporting Elementary Students' Mathematical Modeling Processes Through Interactive Technology*	ETAS 409	6
Bannish	*Agent-based model of branching actin networks*	ETAS 480	5
Zhou	*Toward a Distribution-Theoretic Foundation for Outlier Detection*	ETAS 478	7

3:00 – 3:15 pm

Name	*Title*	Room	Session
Lynam	*An Interesting Example from Dimension Theory*	ETAS 406	8
Perry	*Experience with switching to Open Educational Resources (OER)*	ETAS 409	6
Cheng	*Loss Functions: The Mathematics Behind Machine Learning*	ETAS 480	5
Zhang	*Survival among US adults with post-cancer-diagnosis cigarette smoking cessation*	ETAS 478	7

Saturday Morning, April 11

8:30 – 8:45 am

Name	*Title*	Room	Session
Gamlath, Byrne, Halfpap, Miyasaki, Parker	*Improved Bounds on the Rainbow Turán Numbers for Short Brooms*	ETAS 478	9
Mandava	*FibriNet: A Mechanochemical Simulation Tool for Discovering Strain Dependent Fibrinolysis Dynamics*	ETAS 409	10
Lastrina	*An Introduction to Circle Tic-Tac-Toe*	ETAS 406	11

8:50 – 9:05 am

Name	*Title*	Room	Session
Mantini	*Symmetry and Modular Origami*	ETAS 478	9
Karki	*Electrocardiogram Summarization with Different Beat Segmentations*	ETAS 409	10
Wells	*Pythagoras: Man, Myth, and Math*	ETAS 406	11

Saturday Morning, April 11, continued

10:30 – 10:45 am

Name	*Title*	Room	Session
Inam	*The word problem for one-relation Adian inverse semigroups: new developments*	ETAS 409	12
Hendryx Lyons	*Steeping in Math Conversations: A Shift from Office Hours to Tea Time*	ETAS 406	13
~~Worth~~	~~*A newspaper project for a quantitative reasoning course*~~	~~ETAS 478~~	~~14~~
Mayorga Echeverria	*A graph-aided electrostatic solver*	ETAS 480	15

10:50 – 11:05 am

Name	*Title*	Room	Session
Kemp	*Four Algebraic Proofs of the FTA*	ETAS 409	12
~~Harper, McClain~~	~~*Tiger Tutoring*~~	~~ETAS 406~~	~~13~~
Tran	*Using Origami Constructions to Support Conceptual Understanding of Special Right Triangles in Trigonometric Functions for Precalculus*	ETAS 478	14
~~Rashid~~	~~*Mathematical Modeling of Infectious Disease Dynamics Using SIR and SIRS Frameworks.*~~	~~ETAS 480~~	~~15~~

11:10 – 11:25 am

Name	*Title*	Room	Session
Wright	*The Finite Field of EvenQuads*	ETAS 409	12
Hopkins	*Improving Success in Calculus 1*	ETAS 406	13
Farrell	*Exploring Mathematical Problem-Solving Behaviors*	ETAS 478	14
Murorunkwere	*A Model of an Online Social Network (OSN)*	ETAS 480	15

Index of All Speakers A - P

Room refers to the building and room number.
UG indicates a session of presentations by undergraduates.

Name (Institution)	*Session*	*Day*	*Time*	*Room*
~~Armwood (OKCU)~~	~~8~~	~~Fri~~	~~2:40 - 2:55 pm~~	~~ETAS 406~~
Bannish (UCO)	5	Fri	2:40 - 2:55 pm	ETAS 480
Barker (UALR)	5	Fri	2:00 - 2:15 pm	ETAS 480
Bazzell (OSU)	UG2	Fri	2:00 - 2:15 pm	ETAS 409
Blalack (JBU)	UG1	Fri	1:00 - 1:15 pm	ETAS 406
Byrne (UD)	9	Sat	8:30 - 8:45 am	ETAS 478
Cheng (SAU)	5	Fri	3:00 - 3:15 pm	ETAS 480
Childers (UALR)	4	Fri	2:00 - 2:15 pm	ETAS 478
Cleary (BC)	Faculty Workshop	Fri	9:00 - 11:30 am	ETAS 480
Cleary (BC)	Section Visitor Lecture	Fri	3:45 - 4:45 pm	EIT Auditorium
Davis (UCO)	UG2	Fri	1:20 - 1:35 pm	ETAS 409
Farrell (TU)	14	Sat	11:10 - 11:25 am	ETAS 478
Gamlath (SAU)	9	Sat	8:30 - 8:45 am	ETAS 478
Halfpap (TSU)	9	Sat	8:30 - 8:45 am	ETAS 478
~~Harper (ECU)~~	~~13~~	~~Sat~~	~~10:50 - 11:05 am~~	~~ETAS 406~~
Hendryx Lyons (UCO)	13	Sat	10:30 - 10:45 am	ETAS 406
Hester (UALR)	7	Fri	2:20 - 2:35 pm	ETAS 478
~~Hodges (UAFS)~~	~~UG2~~	~~Fri~~	~~1:00 - 1:15 pm~~	~~ETAS 409~~
Hopkins (UCO)	13	Sat	11:10 - 11:25 am	ETAS 406
Inam (SAU)	12	Sat	10:30 - 10:45 am	ETAS 409
Jefferson (PNNL)	MAA NAM Lecture	Fri	7:45 - 8:45 pm	EIT Auditorium
Karki (UCO)	10	Sat	8:50 - 9:05 am	ETAS 409
Kemp ((Co)Sine Clock Company)	12	Sat	10:50 - 11:05 am	ETAS 409
Khatiwada (UAM)	UG1	Fri	2:00 - 2:15 pm	ETAS 406
Lastrina (ECU)	11	Sat	8:30 - 8:45 am	ETAS 406
Lu (UALR)	4	Fri	2:00 - 2:15 pm	ETAS 478
Lynam (ECU)	8	Fri	3:00 - 3:15 pm	ETAS 406
Mandava (UCO)	10	Sat	8:30 - 8:45 am	ETAS 409
Mantini (OSU)	9	Sat	8:50 - 9:05 am	ETAS 478
Mayorga Echeverria (UA)	15	Sat	10:30 - 10:45 am	ETAS 480
McAnally (UCO)	4	Fri	1:20 - 1:35 pm	ETAS 478
~~McClain (ECU)~~	~~13~~	~~Sat~~	~~10:50 - 11:05 am~~	~~ETAS 406~~
~~McNamara (SWOSU)~~	~~3~~	~~Fri~~	~~1:20 - 1:35 pm~~	~~ETAS 480~~
Miyasaki (ISU)	9	Sat	8:30 - 8:45 am	ETAS 478
Murorunkwere (UALR)	15	Sat	11:10 - 11:25 am	ETAS 480
Myers (ATU)	6	Fri	2:20 - 2:35 pm	ETAS 409
Oehrlein (OCCC)	4	Fri	1:00 - 1:15 pm	ETAS 478
Paez (JBU)	UG1	Fri	1:20 - 1:35 pm	ETAS 406
Parker (ISU)	9	Sat	8:30 - 8:45 am	ETAS 478
Perry (NSU)	6	Fri	3:00 - 3:15 pm	ETAS 409

Index of All Speakers R - Z

Room refers to the building and room number.
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Name (Institution)	*Session*	*Day*	*Time*	*Room*
~~Rashid (UA)~~	~~15~~	~~Sat~~	~~10:50 - 11:05 am~~	~~ETAS 480~~
Rowland (SEOSU)	UG2	Fri	1:40 - 1:55 pm	ETAS 409
Sanders (UALR)	5	Fri	2:20 - 2:35 pm	ETAS 480
Sanjari (UCA)	6	Fri	2:40 - 2:55 pm	ETAS 409
Segrest (UCO)	UG1	Fri	1:40 - 1:55 pm	ETAS 406
Shull (UA)	Student Workshop	Fri	9:00 - 11:30 am	ETAS 483
Simms (UALR*)	5	Fri	2:00 - 2:15 pm	ETAS 480
Skaggs (ATU)	6	Fri	2:20 - 2:35 pm	ETAS 409
Tran (OSU)	14	Sat	10:50 - 11:05 am	ETAS 478
Wells (ECU)	11	Sat	8:50 - 9:05 am	ETAS 406
Westmorland (UCO)	4	Fri	1:40 - 1:55 pm	ETAS 478
Williams (UCO)	4	Fri	1:40 - 1:55 pm	ETAS 478
Wilmes (ECU)	UG1	Fri	2:20 - 2:35 pm	ETAS 406
~~Worth (OKWU)~~	~~14~~	~~Sat~~	~~10:30 - 10:45 am~~	~~ETAS 478~~
~~Worth (OKWU)~~	~~3~~	~~Fri~~	~~1:00 - 1:15 pm~~	~~ETAS 480~~
Wright (OSU)	12	Sat	11:10 - 11:25 am	ETAS 409
Xing (UALR)	3	Fri	1:40 - 1:55 pm	ETAS 480
Zhang (UALR)	7	Fri	3:00 - 3:15 pm	ETAS 478
Zhou (SAU)	7	Fri	2:40 - 2:55 pm	ETAS 478

Thank you for coming, and thank you to our hosts,
University of Arkansas at Little Rock!

Future Section Meeting Hosts

April 1 – 3, 2027
Oklahoma Baptist University
Shawnee, Oklahoma

2028
Southern Arkansas University
Magnolia, Arkansas

2029
University of Tulsa
Tulsa, Oklahoma