2024 OK-AR MAA Meeting Overview and Invited Abstracts

All times Central Daylight Time

Thursday, April 4

4:00 pm – 8:00 pm	Registration and Check-in
4:30 pm	Section NExT
5:00 pm – 8:30 pm	Team Jeopardy Competition
8:30 pm	Integration Bee

Friday, April 5

8:00 am – 3:00 pm	Registration and Check-in
9:00 am – 11:30 am	Student Workshop, *Crazy Curvature.* Edmund Harriss, University of Arkansas
9:00 am – 11:30 am	Faculty Workshop, *Implementing Active Learning with ACUE*. Deborah Korth, University of Arkansas
11:45 am – 1:00 pm	Section NExT Lunch Faculty Sponsors Lunch Department Chairs Lunch
1:00 pm – 2:15 pm	Presented Papers (including Undergraduate Students)
2:15 pm – 2:55 pm	Break
3:00 pm – 4:00 pm	Section Visitor Lecture, *Clocks, Parking Garages, and the Solvability of the Quintic: A Friendly Introduction to Monodromy.* Edray Goins, West Pomona College, Chair – MAA Congress
4:10 pm – 4:45 pm	Presented Papers
4:55 pm – 5:55 pm	Executive Committee Meeting
6:00 pm – 7:45 pm	Banquet
8:00 pm – 9:00 pm	MAA Pólya Lecture, *A Glimpse at the Horizon.* Deanna Haunsperger, Carleton College

Saturday, April 6

8:00 am – 10:00 am	Registration and Check-in
8:30 am – 9:05 am	Presented Papers
9:15 am – 10:25 am	Section Business Meeting
10:30 am – 11:25 am	Presented Papers

All times are tentative until we know the final number of papers to be presented.

Abstracts

Clocks, Parking Garages, and the Solvability of the Quintic: A Friendly Introduction to Monodromy. **(Section Visitor Lecture)**

Edray Goins, West Pomona College, Chair – MAA Congress, Section Visitor

Imagine the hands on a clock. For every complete the minute hand makes, the seconds hand makes 60, while the hour hand only goes one twelfth of the way. We may think of the hour hand as generating a group such that when we "move" twelve times then we get back to where we started. This is the elementary concept of a monodromy group. In this talk, we give a gentle introduction to a historical mathematical concept which relates calculus, linear algebra, differential equations, and group theory into one neat theory called "monodromy". We explore lots of real world applications, including why it's so easy to get lost in parking garages, and present some open problems in the field. We end the talk with a discussion of how this is all related to solving polynomial equations, such as Abel's famous theorem on the insolubility of the quintic by radicals.

A Glimpse at the Horizon. **(MAA Pólya Lecture)**

Deanna Haunsperger, Carleton College

What do a square-wheeled bicycle, a 17th-century French painting, and the Indiana legislature all have in common? They appear among the many bright stars on the mathematical horizon, or, um, in *Math Horizons.* *Math Horizons*, the undergraduate magazine started by the MAA in 1994 publishes articles to introduce students to the world of mathematics outside the classroom. Some of mathematics' best expositors have written for *MH* over the years; here is an idiosyncratic tour of the first ten years of *Horizons*.

Crazy Curvature**. (Student Workshop)**

Edmund Harriss, University of Arkansas

Once you know that the earth is roughly a sphere, a natural question is how exact that might be. Maybe it is slightly wider at the equator? Today we can observe from space, but in the nineteenth century all measurements had to be taken on land. Mathematicians devised some clever ways to look at the angles of triangles and thus detect the curvature of the earth without ever leaving its surface, and so study whether it was the same everywhere. We will explore what happens when you change the angles of a triangle away from the standard 180, and see how this opens up new options in geometry and creating shapes, leading to the geometry of surfaces and wonderful theorems like the Gauss-Bonnet theorem and the Theorem Egregium.

Implementing Active Learning with ACUE**. (Faculty Workshop)**

Deborah Korth, University of Arkansas

Have you ever been in the middle of delivering a riveting and lively lecture and noticed a student nodding off in the front row? Most likely, this student should have gone to bed earlier the night before, but an improved delivery method might have kept the student awake. A 2014 meta-analysis of 225 research studies in STEM classes found that students in classes with active learning performed 6% better on exams than students in classes with traditional lecturing, and that students in classes with traditional lecturing were 1.5 times more likely to fail than in classes with active learning (Freeman et al, 2014). In an effort to improve teaching practices, faculty at the University of Arkansas have completed the "Using Active Learning Strategies" micro-credential course through the Association of College and University Educators (ACUE). These faculty will share quick-to-implement practices related to active learning and then help workshop participants brainstorm ideas for use in their own classes.