

Call for Papers: Contributed Paper Sessions at MAA MathFest 2017

The Mathematical Association of America will hold its ninety-fifth summer meeting in the Hilton Chicago Hotel, 720 South Michigan Avenue, Chicago, Illinois, July 26 – 29, 2017. Full information regarding the program will appear in the April/May issue of *MAA FOCUS* and much of the program is already available online at www.maa.org/mathfest. The purpose of this announcement is to alert participants to the themes of contributed paper sessions. MathFest participants are invited to submit abstracts of papers consistent with the themes of the sessions described below.

Presentations in the themed sessions are normally 15 minutes in length. The general sessions will accept abstracts of papers in all areas of collegiate mathematics, mathematical pedagogy, and the undergraduate mathematics curriculum. Presentations in the general sessions are limited to 10 minutes each.

Each participant may make at most one presentation in the contributed paper sessions, either a presentation in one of the themed sessions or a presentation in one of the general sessions. If your paper cannot be accommodated in the session for which it was submitted, it will automatically be considered for the general contributed paper sessions.

Each session room will be equipped with a computer projector and a screen. Speakers are encouraged to make use of the computer projector but must provide their own laptop computer or have access to one.

To submit an abstract for MAA MathFest 2017, go to www.maa.org/mathfest/abstracts and follow the instructions found there. The deadline for submission of abstracts is April 30, 2017. Early submissions are encouraged.

Please note that days and times assigned to the individual sessions remain tentative and may change.

CONTRIBUTED PAPER SESSIONS WITH THEMES

TCPS#1

Title: Exploring Zeros of Polynomials

Friday afternoon

Description: Recent articles in the *College Mathematics Journal* (May 2014), the *American Mathematical Monthly* (April 2016), and *Mathematics Magazine* (June 2016) have focused on intriguing properties of polynomials and their zeros. Given the long, rich history of this topic in mathematics and the wide array of techniques utilized, we believe talks in this area would appeal to a variety of mathematicians and students. Possible topics include extensions of standard results such as Descartes' rule of signs or the rational roots

theorem, dynamics of numerical root finding schemes, interesting graphical properties of sets of zeros, properties of zeros for specific families of polynomials (e.g., cyclotomic polynomials), novel proofs of standard results, and illuminating talks on well-known theorems and conjectures such as the Gauss-Lucas Theorem, Siebeck's Theorem, and the Sendov Conjecture. Talks that utilize technology to visualize particular phenomena or results are particularly encouraged, as are talks that provide a historical perspective. We are also interested in talks that present open problems suitable for undergraduate research or independent study. Talks in this session should be accessible to advanced undergraduate students.

Organizers: Michael Brilleslyper, U. S. Air Force Academy, and Beth Schaubroeck, U. S. Air Force Academy

TCPS#2

Title: Encouraging Effective Teaching Innovation

Thursday afternoon

Description: Faculty are eager to offer activities in the classroom that foster student success, but many are not formally trained in pedagogy. This session will consist of presentations of demonstrably effective and innovative classroom techniques. Talks will address the reasoning behind, design, and implementation of resources or activities. While these activities may be whole course techniques, we also seek presentations of drop-in activities to bolster student learning and reflection in any course. Techniques do not have to be original to the presenter, but sources must be credited and evidence of success (or failure and redesign) is expected. To maximize the session's usefulness, a Google Drive folder will be created and shared as a repository for the speakers' slides and supplementary materials.

Organizers: Susan B. Crook, Loras College; David Failing, Lewis University; and Russ Goodman, Central College

TCPS#3

Title: Math Potluck: A Student Swap Session

Saturday afternoon

Description: Calling all undergrads and faculty advisors! Does your department have (or want!) a Math Club or student chapter of the AWM, MAA, PME, or SIAM? This session will provide a forum for sharing your favorite or most successful student activity. The presenter(s) will provide a "how-to" for a single math event that a math club or student chapter has held. Together, we will build a toolbox of successful activities to take back to each of our campuses! Following the morning presentations, a free lunch will be held for all presenters and attendees of this session to promote continued discussion and collaboration amongst participants. Please indicate in your abstract submission whether your group is a Math Club or student chapter of AWM, MAA, PME, or SIAM.

Organizers: Alissa Crans, Loyola Marymount University; Jacqueline Jensen-Vallin, Lamar University; Candice Price, University of San Diego; Alejandra Alvarado, Eastern Illinois University; Dora Ahmadi, Morehead State University; Timothy Fest, SIAM; and Angela Spalsbury, Youngstown State University

Sponsors: This session is jointly sponsored by the AWM, MAA, PME, and SIAM

TCPS#4

Title: Online Assessment: Where We Have Been, Where We Are and Where We Are Going
Saturday afternoon

Description: Online assessment is now a common part of the academic experience for faculty and students. The technology has been around long enough to evolve substantially from early implementations. The purpose of this session is to allow faculty to share what is new, what they are hoping for in the future, and what have we learned from present and past implementations of the systems. We also invite contributions regarding pedagogical issues surrounding the use of these resources.

We are seeking expository talks on what resources are available, demonstrations, and innovative ideas as well as scholarly talks about the effectiveness of online assessment resources. Talks on online homework, placement testing, just in time resources and other forms of online assessment are welcome.

Organizers: Barbara Margolius, Cleveland State University, and John Travis, Mississippi College

Sponsors: Committee on Technology in Mathematics Instruction (CTIME) and the SIGMAA on Mathematics Instruction Using the WEB (Web SIGMAA)

TCPS#5

Title: Writing Across the Curriculum in Mathematics
Friday afternoon

Description: Many institutions have adopted "Writing Across the Curriculum" programs and implemented first-year writing seminars. Even when such programs are not in place, instructors are becoming increasingly aware of research that has identified writing as a high impact practice for enhancing student learning. In particular, writing-based assessments help students to shift focus from grades to deep learning and to develop skills that transcend any one subject area. In all levels of math courses, writing assignments can be used to develop critical thinking skills, provide a better understanding of logical argument, and engage students who may otherwise be left behind. This session invites talks on all aspects of writing in mathematics, especially those pertaining to Writing Across the Curriculum programs. We also welcome presentations on the implementation of Writing to Learn principles in math courses, training of students in discipline-specific skills such as proof writing, and interdisciplinary writing initiatives.

Organizers: Anil Venkatesh, Ferris State University; Benjamin Gaines, Iona College; and Victor Piercey, Ferris State University

Sponsor: The SIGMAA on Inquiry-Based Learning (SIGMAA IBL)

TCPS#6

Title: Enrichment, Experiences, and Examples with Modeling in Differential Equations Courses
Thursday afternoon

Description: This session features talks in which colleagues who are using mathematical modeling to motivate the learning of differential equations share their experiences and

mathematical offerings. Hopefully, others will be able to incorporate or build on these activities in their own course. We are interested in talks which feature real data (either collected or taken from the literature, or found online) and a full modeling process for students, i.e. stating assumptions, making identifications, creating a differential equation model, developing solution strategies, performing parameter estimations, rendering model validation, and iterating this process. Some evidence of the success of individual approaches should be offered. Presenters are encouraged to submit articles based on their presentation for consideration in a special issue of PRIMUS entitled, A Modeling First Approach to Teaching Differential Equations.

Organizers: Brian Winkel, SIMIODE Director; Ellen Swanson, Centre College; and Chris McCarthy, Borough of Manhattan Community College, CUNY

TCPS#7

Title: Connecting Introductory Mathematics Courses to Students' Intended Majors and Careers

Friday afternoon

Description: This session explores the many ways in which introductory mathematics courses can be created or renewed to meet the needs of the partner disciplines and lay the groundwork for students' future careers. For example, talks may share novel activities, examples, or projects suitable for introductory mathematics courses that showcase how mathematics is used in the partner disciplines or in specific careers. Presentations may describe curricular innovations, such as courses or pathways, which were designed or revised to support students from specific majors or on specific career paths. Talks may describe successful course-embedded strategies that help first-year students discern their major or career path. Presentations may report on models for collaboration between mathematics faculty and faculty from other departments or people from industry on the introductory mathematics curriculum. Each talk should address some aspect of how introductory mathematics courses can be aligned with external needs of students' intended majors or careers.

Organizers: Rebecca Hartzler, University of Texas-Austin; Suzanne I. Dorée, Augsburg College; Susan Ganter, Virginia Polytechnic Institute and State University; and Thomas A. Hoft, University of St. Thomas

Sponsors: Curriculum Renewal Across the First Two Years (CRAFTY) Committee and Business, Industry, and Government Special Interest Group of the MAA (BIG-SIGMAA)

TCPS#8

Title: Undergraduate Research Activities in Mathematical and Computational Biology

Friday afternoon

Description: This session is dedicated to aspects of undergraduate research in mathematical and computational biology. First and foremost, this session would like to highlight research results of projects that either were conducted by undergraduates or were collaborations between undergraduates and their faculty mentors. Of particular interest are those collaborations that involve students and faculty from both mathematics and biology. Secondly, as many institutions have started undergraduate research programs in this area, frequently with the help of initial external funding, the session is interested in

the process and logistics of starting a program and maintaining a program even after the initial funding expires. Important issues include faculty development and interdisciplinary collaboration, student preparation and selection, the structure of research programs, the acquisition of resources to support the program, and the subsequent achievements of students who participate in undergraduate research in mathematical and computational biology. Finally, the session also welcomes the presentation of materials and project ideas that can be used to help get students started in research in mathematical and computational biology.

Organizer: Timothy D. Comar, Benedictine University

Sponsor: The SIGMAA on Mathematical and Computational Biology (BIO SIGMAA)

TCPS#9

Title: Data Science: Big Data, Big Questions

Thursday afternoon

Description: Data Science. What is it? Why is it important? Who is doing it? How are you using it? Is it only Business Analytics? Come and share your experience as you learn from others about the innovative and quickly growing interest in Data Science. We encourage the submission of scholarly work including but not limited to original research, innovative ideas, demonstrations, problems, applications, projects, curricular materials, single class descriptions, whole course outlines, and whole programs. Proposals will be selected that show innovation, detail, and evidence based results with a primary focus on pedagogy and curriculum related to data science.

Organizers: Jacci White, Monika Kiss, and Brian Camp, Saint Leo University

TCPS#10

Title: Mathematics in Video Games

Saturday afternoon

Description: Video games are a ubiquitous part of popular culture. While it is generally accepted that developing a video game often requires the application of mathematics, many neglect the fact that mathematical principles may appear in how one plays the game. This session seeks presentations of mathematical problems and solutions that may appear in the development or play of modern games. Presenters are encouraged to show college-level mathematics that might appear in a range of courses. We broadly interpret video games to range from single-player to massively multiplayer and to include games played on various types of devices (console, mobile, etc.). This session will be of interest to gamers and instructors looking for innovative examples to use in their classes.

Organizers: Heidi Hulsizer and Nickolas Hein, Benedictine College

TCPS#11

Title: Recreational Mathematics: Puzzles, Card Tricks, Games, Gambling and Sports

Friday afternoon

Description: Puzzles, card tricks, board games, game shows, gambling, and sports provide an excellent laboratory for testing mathematical strategy, probability, and enumeration.

The analysis of such diversions is fertile ground for the application of mathematical and statistical theory. Solutions to new problems as well as novel solutions to old problems are welcome. Submissions by undergraduates or examples of the use of the solutions of these problems in the undergraduate classroom are encouraged.

Organizers: Paul R. Coe and Sara B. Quinn, Dominican University; Kristen Schemmerhorn, Concordia University Chicago

TCPS#12

Title: My Favorite Math Circle Problem

Friday afternoon

Description: A math circle is an enrichment experience that brings mathematics professionals in direct contact with pre-college students and/or their teachers. Circles foster passion and excitement for deep mathematics.

Papers in this session highlight either a favorite problem from a math circle, or favorite collection of problems used together for one or two sessions of a math circle. Contributed papers should describe the launch of the problem, what happens during the circle, and ways of "wrapping up" even if that doesn't involve answering the problem.

Organizer: Bob Klein, Ohio University

Sponsor: The SIGMAA on Math Circles for Students and Teachers (SIGMAA MCST)

TCPS#13

Title: Innovative Approaches to Calculus Preparation

Thursday afternoon

Description: Success in most science, technology, engineering and mathematics (STEM) fields relies on calculus, and success in calculus relies on a good foundation in algebra and trigonometry. Although many students get that foundation in high school, many others – including many members of at-risk populations – arrive at college deficient in the basic skills they need for success in calculus. Most of these students have taken some variety of precalculus course, and repeating the same material, only faster, is often not an effective strategy. The aim of this session is for teachers and researchers to share ideas for how to improve the preparation of students for the study of calculus at the college level. We invite scholarly presentations of ideas to improve success in calculus among underprepared students. Such ideas may include, but are not limited to: research on student preparation or improvements in placement; research demonstrating effective instructional strategies, innovative classroom activities or pedagogies; redesigned prerequisite sequences or intervention strategies.

Organizers: Benjamin V.C. Collins and Jennifer Good, University of Wisconsin-Platteville; Nathan Warnberg, University of Wisconsin-La Crosse

TCPS#14

Title: Euclid and the Mathematics of Antiquity in the 21st Century

Saturday afternoon

Description: Euclid's Elements is a fundamental text of mathematics in the western tradition. Geometry, number theory, logic, and the axiomatic method, all bear Euclid's

stamp. Moreover, the Elements was considered a central text of every liberal arts education well into the nineteenth century, more than two millennia after its writing.

The recent centennial of the MAA provides a fitting occasion on which to revisit the influence of mathematics past on future mathematics and culture. We seek contributions that relate the work of Euclid or other mathematicians of antiquity to modern mathematics or the modern undergraduate curriculum. Original research, unique expositions, descriptions of courses with a significant integration of the mathematics of antiquity, and curricular materials are all welcome.

Organizers: Elizabeth T. Brown, James Madison University, and Edwin O'Shea, James Madison University

TCPS#15

Title: Novel Introductions to Number Theory

Thursday afternoon

Description: This session invites presenters to share interesting ways in which to introduce undergraduate students to topics in number theory. These "tastes" of number theory may be demonstrations, in-class activities, projects, proofs, or ways in which to guide undergraduates to explore and learn about areas of number theory while improving their ability to write proofs. Those discussing demonstrations or in-class activities are encouraged to share key portions. Presenters are welcome to share their first experiences teaching topics in number theory or how they have modified their approaches over time. Presentations related to teaching topics with which students experience difficulty and student reaction as well as information about successes and failures are encouraged. Abstracts should provide a glimpse of the demonstration, in-class activity, project, or proof to be discussed and information about the related topics in number theory in addition to the software or application, if any, used. Those whose presentations are dependent upon software or tablet explorations must provide their own laptop or tablet.

Organizer: Sarah L. Mabrouk, Framingham State University

TCPS#16

Title: Inquiry-Based Teaching and Learning

Saturday afternoon

Description: The goal of Inquiry-Based Learning (IBL) is to transform students from consumers to producers of mathematics. Inquiry-based methods aim to help students develop a deep understanding of mathematical concepts and the processes of doing mathematics by putting those students in direct contact with mathematical phenomena, questions, and communities. Within this context, IBL methods exhibit great variety. Activities can take place in single class meetings or span entire curricula for students of any age; students can be guided to re-invent mathematical concepts, to explore definitions and observe patterns, to justify core results, and to take the lead in asking new questions. There is a growing body of evidence that IBL methods are effective and important for teaching mathematics and for fostering positive attitudes toward the subject. This session invites scholarly presentations on the use of inquiry-based methods for teaching and learning. We especially invite presentations that include successful IBL activities or assignments, that

support observations about student outcomes with evidence, or that could help instructors who are new to IBL to try new methods.

Organizers: Brian P. Katz, Augustana College, and Victor I. Piercey, Ferris State University

Sponsor: The SIGMAA on Inquiry-Based Learning (SIGMAA IBL)

GENERAL CONTRIBUTED PAPER SESSIONS

MAA General Contributed Paper Sessions

Thursday morning and afternoon, Friday morning and afternoon, Saturday morning and afternoon

Description: The general sessions accept abstracts of papers in all areas of mathematics, pedagogy, and the undergraduate mathematics curriculum. When you submit your abstract you will be asked to place it in one of the following categories:

- Assessment
- History and Philosophy of Mathematics
- Interdisciplinary Topics in Mathematics
- Mathematics and Technology
- Mentoring
- Modeling and Applications
- Outreach
- Teaching and Learning Advanced Mathematics
- Teaching and Learning Calculus
- Teaching and Learning Developmental Mathematics
- Teaching and Learning Introductory Mathematics
- Teaching and Learning Other Mathematics
- Algebra
- Analysis
- Applied Mathematics
- Geometry
- Graph Theory
- Linear Algebra
- Logic and Foundations
- Number Theory
- Probability and Statistics
- Other than the above

Organizers: Feryal Alayont, Grand Valley State University, and Holly Zullo, Westminster College

CALL FOR GRADUATE STUDENT PAPERS

Great Talks for a General Audience: Coached Presentations by Graduate Students

Saturday, 1:00 – 5:00 p.m.

Description: Presenters in this session must be graduate students. While many graduate students will be asked to give a lecture to an audience consisting of undergraduates and non-mathematicians (possibly as part of a job interview), most students do not have much experience talking to a non-research audience. This session gives graduate students the opportunity to give a 20-minute talk aimed at an undergraduate audience (speakers should assume the audience has been only exposed to calculus and possibly some linear algebra). Both the talks and abstracts should be designed to excite a wide range of undergraduates about mathematics. All participants in this session will receive private feedback on their presentations from an established faculty member and an undergraduate student. Contact a session organizer for help writing an abstract or preparing your talk for a general audience. Optional Q&A sessions with the organizers will be held at MathFest for presenters to receive feedback on their talks. Graduate student participants in this session should also attend the graduate student workshop (What's the Story?).

Organizers:

Jim H. Freeman, Cornell College <jfreeman@cornellcollege.edu>

May Mei, Denison University <meim@denison.edu>

Aliza Steurer, Dominican University <asteurer@dom.edu>

Sponsor: MAA Committee on Graduate Students

CALL FOR UNDERGRADUATE STUDENT PAPERS

The deadline for receipt of abstracts for student papers is Friday, June 2, 2017. Students may not apply for funding from both MAA and Pi Mu Epsilon. Every student paper session room will be equipped with a computer projector and a screen. Presenters must provide their own laptops or have access to one. Each student talk is fifteen minutes in length.

MAA Sessions

Thursday morning and afternoon, Friday morning and afternoon

Students who wish to present at the MAA Student Paper Sessions at MathFest 2017 must be sponsored by a faculty advisor familiar with the work to be presented. Abstracts should be submitted at www.maa.org/mathfest/abstracts.

Some funding to cover costs for student presenters is available through the MAA Student Travel Grant. The application will be available starting in April on the MAA Student Travel Grant webpage.

For additional information visit www.maa.org/students/undergrad.

Contact Persons:

T. J. Hitchman, University of Northern Iowa theron.hitchman@uni.edu; Eric Ruggieri, College of the Holy Cross eruggier@holycross.edu; and Chasen Smith, Georgia Southern University csmith@georgiasouthern.edu

Pi Mu Epsilon Sessions

Thursday morning and afternoon, Friday morning and afternoon

Pi Mu Epsilon student speakers must be nominated by their chapter advisors. PME Student members who wish to represent their chapters as student speakers or official delegates should visit the PME website at <http://pme-math.org/> for more information.

Contact Person:

Darci Kracht, Kent State University darci@math.kent.edu