

## JMM 2010

**SIGMA MCST SESSIONS: Fostering, supporting, and propagating Math Circles**

THURSDAY, Jan.14, 1:00 - 4:15 pm (Part I)

SATURDAY, Jan.16: 1:00 - 5:00 pm (Part II)

### SCHEDULE OF EVENTS AND ABSTRACTS

#### SESSION PART I

DAY: Thursday Jan. 14

TIME: 1:00 - 4:15 p.m.

LOCATION: Pacific J, Marriott San Francisco

#### SCHEDULE:

**1:00 - 1:25 James Tanton:** Opening Remarks and presentation:

*On Finding Successful Math Circle Questions and Topics.*

**1:30 - 1:50 Steve Dunbar:**

*Lincoln Area Math Teachers' Circle: 3 Years and Growing*

**1:55 - 2:15 Jamylle Carter:**

*What I Learned Running the Oakland Math Circle*

**2:20 - 2:40 Tom Kilkelly:**

*ARML Power Contest from Math Circles to Classrooms*

**2:45 - 3:05 Ralf Youtz and Jon Yaggie:**

*Student-to-student connections: Graduate students in math circles*

**3:10 - 3:30 Lee Windsperger:**

*The LSU Math Circle*

**3:35 - 3:55 Tatiana Shubin and Mary Fay-Zenk:**

*Bringing Math Teachers' Circle Lessons to a Middle School Classroom*

**4:00 - 4:15 Alex McFerron:**

*A Great Math Circle - an Exploration of Deltrahedra with Origami*

ABSTRACTS APPEAR AT THE END OF THIS DOCUMENT

#### SESSION PART II

DAY: Saturday Jan. 16

TIME: 1:00 - 5:00 p.m.

LOCATION: Room 3008, 3<sup>rd</sup> Floor, Mascone Center

**1:00 - 1:05 Tatiana Shubin** Comments of Welcome from the new chair

**1:05 - 2:15 Josh Zucker DEMONSTRATION MATH CIRCLE CLASS**

**2:15 - 2:45** Time to explore the problem stations about the room

**2:50 - 4:00 THE GREAT MATH WRANGLE**

Witness a game of mathematical wits for young students

**4:00 - 4:30** Brief responses and five-minute talks

**4:30 - 5:00** General Discussion

## **ABSTRACTS**

**Speaker: Steven Dunbar**

**Title: Lincoln Area Math Teachers' Circle: 3 Years and Growing**

The Lincoln Area Math Teachers' Circle is now in its third year of activity, still going strong. I'll talk about the several factors that have contributed to its success and how they developed. One of the important factors is having the right kind of mathematical topic, so I'll highlight several of our favorite and most successful topics. I'll suggest how you can develop similar success factors in your area, and what others are already doing.

**Speaker: Janylle Carter**

**Title: What I Learned Running the Oakland Math Circle**

The Oakland Math Circle (OMC) was an after-school mathematics enrichment program for African-American middle-school students that took place during the 2007–2008 academic year in Oakland, California. Funded mainly by an MAA Tensor-SUMMA (Strengthening Underrepresented Minority Mathematics Achievement) grant, the OMC used hands-on activities and community partnerships to make advanced mathematics accessible and enjoyable for African-American middle-school students. I will share what I learned in creating and running the OMC.

**Speaker: Tom Kilkelly**

**Title: ARML Power Contest from Math Circles to Classrooms**

Math Circles are often centered around a topic that evokes curiosity, stimulates participation, requires investigation, and often leads to unexpected results. Oftentimes a good lesson in the classroom also has these qualities. Although the ARML Power Contest is intended to be a competition, its topical format allows the problem sets to be used in both settings. As director of and problem writer for the ARML Power Contest, the presenter will talk about the competition and some of the motivation for past problem sets.

**Speakers: Ralf Youtz and Jon Yaggie**

**Title: Student-to-student connections: Graduate students in Math Circles**

Funded by an NSF GK-12 grant, the Creating Momentum through Communicating Mathematics [(CM)<sup>2</sup>] program is designed to support mathematics graduate students as they do research, and connect these students to the larger community. This connection is made through work with local public school students in both the class room and San Francisco Math Circle. Traditionally math circles are led by faculty mathematicians, here the experience is shared by graduate students. In this talk, two (CM)<sup>2</sup> fellows reflect on the impact of their experience on both students and themselves.

**Speaker: Lee Windsperger**

**Title: The LSU MathCircle**

This talk will be an introduction to the LSU MathCircle summer enrichment program. The LSU MathCircle is a three week summer program geared toward high school students interested in investigating concepts in mathematics that are not usually introduced at the high school level. The program focuses on developing problem solving abilities, critical thinking and logical reasoning by exposing the students to interesting problems and ideas in various branches of mathematics including combinatorics, number theory, probability, topology and dynamical systems. In addition to working on problems, participants also get to hear guest lectures by LSU professors and enjoy recreational breaks and trips to local scientifically-based industries and research centers. In the final week, the students choose an interest area and work on a problem in small research teams led by LSU graduate students. At the end of the camp, the students present their work to LSU professors and undergraduate REU students. We will have one such team at the joint meetings to present their work from the previous summer.

**Speakers: Tatiana Shubin and Mary Fay-Zenk**

**Title: Bringing Math Teachers' Circle Lessons to a Middle School Classroom**

The Math Teachers' Circles (MTC) are organizations of middle school math teachers and professional mathematicians whose mission is to foster a culture of mathematical problem solving in the middle school classroom. Teachers participating in MTCs bring creative, collaborative problem solving into their classrooms. In this talk we will give an overview of the national MTC network, and will demonstrate specific lesson plans developed by Mary Fay-Zenk, a (retired) middle school teacher and the inventor of MTCs.

**Speaker: Alex MacFerron**

**Title: A Great Math Circle - an exploration of deltrahedra with origami**

Building origami is fun. During this 20 min talk I will teach you how to give a math circle using origami. The material I will teach leads participants to create convex deltrahedra with only business cards. Deltrahedra are polyhedra that have equilateral triangles for faces. The business cards create two equilateral triangles each. This math circle curriculum starts by teaching the participants how to make a tetrahedron, octahedron, and then an icosahedron. This is a perfect exercise to naturally get people talking and working together. The task requires multiple hands when first learning how to build the shapes. This helps develop in the participants two important skills for advanced mathematics. First, one must learn how to admit when they are lost and ask clarifying questions. Second, one must learn how to explain to collaborators what they have figured out so that further collaboration is possible. This math circle curriculum focuses on practicing these skills. While the shapes are being made, math definitions and concepts are brought up as topics and a data table is built expressing the details of each shape. The math circle ends with drawing conjectures about the shapes and asking the question: "Why is it that only 8 convex deltrahedra exist?" This is an interesting question for all levels. After this 20 min talk, you will be able to give this origami math circle to your students.