Materials from the 2006 Section Meeting, held April 7-8 at the Four Points by Sheraton, Tucson, Arizona. Originally posted at

http://oak.ucc.nau.edu/hagood/MAASW/maa2006.html

Annual Meeting
Southwestern Section of the MAA
and ArizMATYC
April 7-8, 2006

Four Points by Sheraton
1900 E. Speedway Boulevard
Tucson, Arizona

Schedule

Abstracts

RegistrationForm (doc)

RegistrationForm (html)

Call for Papers

Deadline March 15, 2006

The annual meeting of the Southwestern Section of the MAA and ArizMATYC will be held on April 7-8, 2006 at the FOUR POINTS BY SHERATON,TUCSON UNIVERSITY PLAZA, 1900 E. SPEEDWAY BLVD,TUCSON, AZ.

The Friday night banquet, as well as all of the meetings will be held at the facilities of this hotel. There will be three meeting rooms available, allowing us to hold three concurrent sessions. There is also ample space in the halls outside the meeting rooms for exhibitors.

For those wishing to stay at another hotel here are some possibilities:

1. Days Inn (I-10 and Congress), 222 S. Freeway, 85745 520-791-7511 or 1-800-325-2525 daily rate is $39.95 plus tax (queen bed) - $49.95 plus tax (two double beds)
2. Howard Johnson (22nd and Starr Pass), 1010 S. Freeway, 85745 520-622-5871, daily rate is $42.99 plus tax (king bed)
3. Best Western, 1015 N. Stone, 520-622-8871 daily rate is $78.00 plus tax (king, queen, or two double beds) this includes breakfast (cooked to order not continental).

Invited Speakers

Lesley Ward
Dept of Mathematics
Harvey Mudd College
The Harvey Mudd College Mathematics Clinic

Steve Dunbar
Department of Mathematics
University of Nebraska-Lincoln
The MAA American Mathematics Competitions:

Easy Problems, Hard Problems, History and Outcomes

More information about the speakers and the talks.

RegistrationForm

Call for Papers

Deadline March 15, 2006

Meeting Contact:

William Y. Velez
Department of Mathematics
The University of Arizona
P.O. Box 210089
Tucson, AZ 85721-0089
Phone: (520) 621-2259
Fax: (520) 621-8322

Abstracts for talks at the SW MAA meeting, April 7-8, 2006

Invited Addresses

1. Dr Lesley Ward, Dept of Mathematics, Harvey Mudd College Title of talk: The Harvey Mudd College Mathematics Clinic.
2. Steve Dunbar, Department of Mathematics, University of Nebraska-Lincoln: Title of Talk: The MAA American Mathematics Competitions: Easy Problems, Hard Problems, History and Outcomes Abstract: The MAA has continuously sponsored nationwide high-school level math contests since 1952. The sequence of contests now spans 5 different contests at increasing levels of mathematical sophistication. Students who succeed at the top level on these contests become the team representing the U.S. at the annual International Mathematical Olympiad. I'll survey the history and organization of the contests, along with the outcomes and some notable mathematicians whose early indications of talent came on these contests. I'll comment about the intersection of these contests with the school mathematics curriculum. Along the way, I'll showcase some interesting, easy, and hard mathematical problems from these contests.

Friday, April 7, 2006

10:00, Salon A: Richard Thompson, University of Arizona
Title: Discovering New Mathematics While You Teach

Abstract: Mathematics is much more than a collection of theorems and their proofs. It is a rapidly expanding body of knowledge and thought patterns that is being done live, and in real time by human beings called mathematicians. Many new concepts come from extensions of known results and from new ways of looking at existing topics. Communicating this to students at all levels is very important. There is no more compelling way to demonstrate the development of new mathematics than by thinking "on your feet" in the classroom. I will discuss three examples of such experiences that came up in one course during a recent semester. (i) Did Bernoulli know EVERYTHING about Bernoulli's Inequality? (ii) Have you ever seen a LOCAL LINEAR APPROXIMATION OF ORDER n? (iii) A computer can approximate a NONEXISTENT number to 5 decimal places!

I will use computer illustrations for the examples. The talk should be accessible to anyone who has completed a basic calculus sequence.

10:00, Salon B: Derek Habermas and Erin McNicholas, University of Arizona

Title: Concept Tests

10:00, Salon C: Feryal Alayont, Marilou Mendel, University of Arizona, Joseph Erker, Pima Community College

A panel discussion on Writing in mathematics

Abstract: Incorporating writing into mathematics has many positive outcomes, if done carefully. In this panel, we will discuss the various ways writing assignments can be used in mathematics courses at different levels with concrete examples, how the writing assignments can be structured to obtain the greatest benefit, and the design of effective grading rubrics for writing assignments.

Schedule

Annual Meeting
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Friday, April 7, 2006

Time	Salon A	Salon B	Salon C
8:00-3:00	**Registration in Conference Center**		
8:45	Refreshments Available and Introductions		
9:00	Dr Lesley Ward, Dept of Mathematics, Harvey Mudd College Title: The Harvey Mudd College Mathematics Clinic		
9:50-10:00	**Break**		
10:00	Richard Thompson: Discovering New Mathematics While You Teach	Derek Habermas and Erin Mcnicholas: Concept Tests	Feryal Alayont, Janet McShane, Joseph Erker, Mary Sibayan: Writing in mathematics
10:45-10:50	**Break**		
10:50	Bill McCallum, Deborah Hughes-Hallet: Algebraic Manipulation	Chris Mikel: Mentoring from a student's perspective	April Strom: The Role of Covariational Reasoning in Learning and Understanding Exponential

			Functions
11:35-11:40	**Break**		
11:40	Gabriel Mendoza and Alfredo Rodriguez: Tablet PCs and implementation	Mary Sibayan and Dan Madden: Articulation Task Force	Adam Stinchcombe: The Lagrange Interpolation Polynomial
12:25-1:30	**Lunch**		
1:30	Frank J. Attanucci: Analyzing the Surface Behavior of the Fluid in a Revolving Container	Kim Marsden: Pearson Education/ Addison Wesley: Taking Homework Integration to the Next Level with MathXL	Rebecca Hartzler: The MAC^3 program
2:15-2:20	**Break**		
2:20	Janet McShane, Nándor Sieben and John Hagood: The WeBWorK Homework System: College Mathematics through Linear Algebra	Ksenija Simic and Matt Ondrus: Experiences and reflections of two math post-docs involved in a math education grant	
3:05-3:15	**Refreshments, partially supported by John Wiley and Sons Publishers**		
3:15	Shafiu Jibrin: Generating Uniform Points on the Boundary of Bounded Spectrahedron	Anne Dudley: Math & Jeopardy (or I have an answer, do you know the question?)	Rebecca Hartzler: The MAC^3 program

4:00-4:05			
4:05	Glenn Hurlbert, Fred Stevenson: Panel Discussion: Efforts to increase the number of high school mathematics teachers	Janet M. McShane, Michael I. Ratliff: Pictures at a Regression	Rebecca Hartzler: The MAC^3 program
5:05			ArizMATYC Business Meeting
6:30	**Banquet at Hotel: Room Wildcat 1**		
	The following companies will have exhibition tables at the conference		
	Houghton-Mifflin Pearson Education/Addison Wesley Brooks/Cole-Thomson Learning Wiley and Sons Publishers Prentice Hall Mathematical Association of America		John

Saturday, April 8, 2006

Time	Salon A	Salon B	Salon C
8:45	**Refreshments Available and Introductions**		
9:00	Steve Dunbar, Department of Mathematics, University of Nebraska-Lincoln, Title of talk: The MAA American Mathematics Competitions: Easy Problems, Hard Problems, History and Outcomes.		
9:50-10:00	**Break**		
10:00	1. Dorin Dumistriscu: High School Calculus Class Visitation Project	Nick Ercolani: Efforts to increase the number of students pursuing degrees in mathematics	
10:45-10:50	**Break**		
10:50- 11:35			Business meeting, MAA

Friday, April 7, 2006

10:50, Salon A: William McCallum and Deborah Hughes Hallett, University of Arizona

Title: Algebraic Manipulation

Abstract: In this workshop-discussion, we will start by considering the questions:

- What is algebra?
- What do our students need?

The students in College Algebra are diverse in backgrounds and interests. Some need to understand data and mathematical models; others need to be able to read and manipulate mathematical formulas. We will concentrate on the needs of the second group, for whom great possibilities are emerging. The workshop will ask participants to consider the categories of problems that encourage students to think critically about algebra. We believe that conceptual understanding is essential to the development of algebraic fluency, and that well-constructed problems can make a major contribution to this. In the workshop, participants will comment on the problem types presented, and have the opportunity to present their own.

10:50, Salon B: Chris Mikel, Coordinator of the Math Center, University of Arizona, will moderate a panel of undergraduate and graduate students on the topic: Mentoring from a student's perspective.

10:50, Salon C: April Strom, Scottsdale Community College

Title: The Role of Covariational Reasoning in Learning and Understanding Exponential Functions

Abstract: Understanding the concept of exponential functions and multiplicative rate of change is critical for students as they progress through mathematics. Not only are exponential growth and decay topics encountered in our everyday world, these functions are embedded in the sciences as well as mathematics, and they provide a model for representing multiplicative growth and decay patterns for real world phenomena. The National Council of Teachers of Mathematics (NCTM, 2000) and the American Mathematical Association of Two-Year Colleges (AMATYC, 1995) standards advocate for high school and college mathematics curricula to include the topic of exponential
functions and emphasize the importance of developing this functional understanding and multiplicative behavior conceptually through the use of real world contexts. Research has shown that students experience difficulty developing a profound and robust understanding of exponential functions (Confrey & Smith, 1995; Weber, 2002). However, irrespective of these findings, more research is needed to investigate the process of coming to understand exponential functions. This paper will discuss the role of covariation in learning exponential functions and in the development of building a
profound, flexible knowledge base of multiplicative structures. Findings from a study will be discussed on the various ways that high school mathematics and science teachers use covariation when performing exponential function tasks.

11:40: Salon A: Gabriel Mendoza and Alfredo Rodriguez, El Paso Community College

Title: Tablet PCs and implementation

Abstract: Technology is evolving our world every day. The Tablet PC is revolutionizing how we teach and deliver our lecturing material to our students. Tablet PC's give us the opportunity to work and project our lectures on to a board for the students to see via an LCD projector. At the end of your lecture, you have the opportunity to distribute these notes by means of email to every student in your class. As one may know Tablet PC's can be quite expensive, so as a result an alternative to this technology wonder will also be presented. The WACOM Mouse Pen is a device that acts similar to the Tablet PC at a fraction of the cost. At the end of this presentation, we will have a discussion of the benefits and disadvantages of this technology in the classroom.

11:40, Salon B: Mary Sibayan, Pima Community College and Dan Madden, University of Arizona, are organizing the Articulation Task Force.

Friday, April 7, 2006

11:40, Salon C: Adam Stinchcombe, Arizona Eastern College

Title of talk: The Lagrange Interpolation Polynomial.

Abtract: The Lagrange interpolation polynomial is designed to pass through any given set of function values. In comparison to least squares, the Lagrange interpolation polynomial gives R2 = 1 each time. The formula looks intimidating but one can make sense out of it by seeing how it fits a parabola through three points. It can be the source of fun explorations in calculus, especially when supplemented by a CAS. In linear algebra, the Lagrange interpolation polynomial also suggests an alternate basis for the vector space of nth degree polynomials.

1:30, Salon A: Frank J. Attanucci, Maricopa Community College

Title: Analyzing the Surface Behavior of the Fluid in a Revolving Container.

ABSTRACT: A container has a bottom that lies in the xy-plane and sides that are parallel to the z-axis (all lengths measured in meters). The container sits on a turntable, centered at the origin, which turns about the z-axis at an angular speed (radians per sec). I investigate the shape of the surface of the fluid in the spinning container (assuming that the angular speed of the fluid is everywhere the same as the angular speed of the container and that every point in the fluid moves in a circular path). Specifically, I derive formulas for the height of the fluid Z as a function of its radial distance from the axis of rotation and the angular speed of the turntable, i.e., . I then use these formulas to find the angular speed needed so that the depth of the fluid (at its shallowest point) "just reaches" zero and, at this speed, I calculate the maximum height of the fluid along the side of the container. In addition to deriving these formulas for fluid height from relevant physics principles, I create an animation of the phenomenon using Maple. Finally, I conduct the experiment in order to confirm that the fluid in one such spinning container (here, a rectangular parallelepiped) in fact behaves in the manner predicted by the theory.

1:30, Salon B: Kim Marsden, Pearson Education/Addison Wesley

Title: Taking Homework Integration to the Next Level with MathXL.

1**:30, Salon C**: **Rebecca Hartzler,** Edmonds Community College

Rebecca Hartzler will be doing the 1 hour informative session and 2 hour workshop on the MAC^3 program.
Abstract: The Mathematics Across the Community College Curriculum project has influenced over 28 disciplines and two-dozen institutions. Come get inspired about the many mathematics applications that exist in other disciplines and how you can help to make mathematics a welcome and indispensable part of the entire undergraduate curriculum.

2:20, Salon A: Janet McShane, Nándor Sieben and John Hagood, Northern Arizona University

Title: The WeBWorK Homework System: College Mathematics through Linear Algebra.

Abstract**:** During the past two years, our department has implemented the WeBWorK homework system in a variety of courses, from College Mathematics through Linear Algebra. As part of this, we have developed problem sets for College Mathematics, Discrete Mathematics, Finite Mathematics, Precalculus, Statistics and other courses which are now available as part of the national problem library on the University of Rochester WeBWorK server. We will give a brief demonstration of WeBWorK, present data from our use of WeBWorK, and present some of the contributions of our department to this national project.

Friday, April 7, 2006

2:20, Salon B: Ksenija Simic and Matt Ondrus, University of Arizona

Title: Experiences and reflections of two math post-docs involved in a math education grant:

Abstract: The NSF-funded Center for the Mathematics Education of Latinos/as (CEMELA)[1] is an interdisciplinary, multi-university consortium focused on the research and practice of the teaching and learning of mathematics with Latino students in the United States. CEMELA aims to understand the interplay of mathematics teaching and learning and the language, social, cultural and political issues that affect Latino communities. The Center has been in existence since fall 2004, and the two of us have been involved as fellows since spring 2005. In this talk, we will get the audience better acquainted with CEMELA through the following questions: What is CEMELA, and what are the backgrounds of the people involved? Why did we get involved? What do mathematicians bring to CEMELA and what does CEMELA bring to mathematicians? What do non-mathematicians bring to CEMELA? What (specifically) have we done as part of CEMELA? Who might be interested in becoming part of CEMELA as a graduate student, and how does one become involved?

3:15, Salon A: Shafiu Jibrin, Northern Arizona University

Title: Generating Uniform Points on the Boundary of Bounded Spectrahedron

Abstract: This talk presents algorithms for generating (asymptotically) uniform points on the boundary of full-dimensional bounded spectrahedron (a closed convex set defined by set of linear matrix inequality constraints). The algorithms have a potential application to solving semidefinite programming problems.

3:15, Salon B: Anne Dudley, Maricopa Community College

Title: Math & Jeopardy (or I have an answer, do you know the question?)

Abstract: Come play Jeopardy with Anne Dudley and reflect on 20 years of change in mathematics education. Along the way, you will dust the cobwebs off your memories and laugh about the way things were (and are). Be careful, you might even learn something you can use in the classroom on Monday!

4:05, Salon A: Glenn Hurlbert, Arizona State University, Fred Stevenson, and William McCallum, University of Artizona, will lead a panel discussion efforts by mathematics departments to help increase the number of high school mathematics teachers teachers.

4:05, Salon B: Janet M. McShane and Michael I. Ratliff, Northern Arizona University

Title: Pictures at a Regression

Abstract: The overall intention of this talk is to compare various simple regression methods by looking at their graphical performance. The regression methods that we consider are: the least squares method, the least absolute value of errors method, Theile's complete method, Theile's incomplete method, and the so-called Med-Med method. We first describe each method, and compare how each method performs on a given data set. We then vary the data sets with respect to the correlation coefficient, and consider how each method responds. Lastly, we append an additional point, (x,y), to our data sets, and look at the graph of the function $m(x,y)$, the slope of the new line of regression, as a function of the point (x,y). These graphs or pictures will give us a sense of how the various regression methods are influenced by adding an additional point to a data set, and from this we can graphically determine the most and least influential points.

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Saturday, April 8, 2006

10:00, Salon A: Dorin Dumistriscu, University of Arizona

Title: The Calculus Visitation Project at UA: encouraging high-school students to take more math courses in college

10:00, Salon B: Nick Ercolani and William Y. Velez, University of Arizona, will continue the discussions from the banquet talk concerning how we can all work together to increase the number of our students pursuing degrees in mathematics.

Exhibitors:

We are very grateful for the financial support of the following companies.

Houghton-Mifflin
Brooks/Cole-Thomson Learning
Prentice Hall
Pearson Education/Addison Wesley
John Wiley and Sons Publishers
Mathematical Association of America

Registration
Southwestern Section of the MAA and ArizMATYC
Tucson, Arizona, April 7-8, 2006

The meeting will be held at the **FOUR POINTS BY SHERATON,TUCSON UNIVERSITY PLAZA, 1900 E. SPEEDWAY BLVD,TUCSON, AZ 85719.**

A block of rooms have been reserved at the Four Points for the MAA meeting. The daily rate for the hotel is $104.00 (single or double) plus taxes. Reservations should be made by calling the hotel directly (**1-800-325-3535, 520-327-7341)**. Please mention that you are with the MAA group to receive this rate. The block of rooms will be held until March 23rd. Information about the other hotels and scheduled events can be found at the following website:
http://oak.ucc.nau.edu/hagood/MAASW/SWSection.htm

Please submit the form below before March 23, 2006. This will help us to have a reasonable count for rooms, supplies and meals. After that date, meeting registration will still be accepted. Banquet seating is limited, so although you may request banquet tickets later than March 23, 2006, there is no guarantee that seats will be available.

Name (as you want it on name tag): _____
Professional Affiliation: _____
4 yr college/university __ 2 yr college __ school __ business/government __
Position: Faculty __ Undergraduate Student __ Graduate Student __ Other (specify) _____
Memberships (check all that apply): MAA __ AMATYC __ ArizMATYC __ NCTM __
AATM ___ AMS ___ SIAM ___ AWM ___ Other _____
Mailing Address: _____
_____
Telephone: _____ Fax: _____
e-mail: _____
Registration Fee: General Registration: $15 __ Retirees and Students $5___
Friday Night Banquet (number) _____ at $25 each* Total Enclosed _____

***Banquet fees should arrive by March 23, 2006. It may not be possible to honor later requests. Make checks payable to: MAA SW-Section**

Send to:

William Yslas Vélez
Department of Mathematics
617 N. Santa Rita
P.O. Box 210089
The University of Arizona
Tucson, Arizona 85721-0089

Proposal for talks should be sent in by March 15, 2006 to allow time to create a schedule. Please send title and abstract to W. Y. Vélez at the address above, or by email (velez@math.arizona.edu). If you would like to organize a panel then please contact W. Y. Vélez as soon as possible to make arrangements. Overhead projectors and screens, projectors for your laptops will be available. No laptops will be provided. Blackboards will not be available.

Call for Papers

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Proposals for talks are invited on mathematics and the teaching of mathematics. Talks will be scheduled for about 20 minutes, depending on the number of talks submitted.

Proposal for talks should be sent in by March 15, 2006 to allow time to create a schedule. Please send title and abstract to W. Y. Vélez at the address above, or by email (velez@math.arizona.edu). If you would like to organize a panel then please contact W. Y. Vélez as soon as possible to make arrangements. Overhead projectors and screens, projectors for your laptops will be available. No laptops will be provided. Blackboards will not be available.

Some proposed sessions (talks are not limited to these areas!):

- Mathematical aspects of games. Yash Mittal (UA) is proposing to talk about the increasing trend now to `mathematize' origami. There might be some other ideas for bringing in more mathematics into other games. Anyone interested in joining in a special session on this general topic should contact Yash Mittal (mittal@math.arizona.edu) or William Y. Velez (velez@math.arizona.edu).

- Increasing the number of high school math teachers. Fred Stevenson, Marilyn Carlson and Glenn Hurlbert are organizing a special session on efforts mathematics departments are making to help increase the number of high school math teachers. Both ASU and UA will be making presentations on some of our efforts, and we would love to have others of you share what you may be doing in this direction. Please contact Fred (frstv@math.arizona.edu), Marilyn (carlson@math.la.asu.edu), or Glenn (hurlbert@asu.edu) if you would like to participate.

- Mathematics Across the Community College Curriculum. Sessions on the NSF funded MAC^3 project of AMATYC, presented by Rebecca Hartzler, Seattle Central Community College.

- Algebraic manipulation: What is it, why we need it, how to teach it, why students have so much trouble with it, and what difference that makes in their academic lives.

- Mentoring from a student's perspective: A panel of students will express their views on how mentoring has affected their careers. Chris Mikel (mikel@math.arizona.edu) has agreed to organize this panel here.

- Graduate students directing undergraduate research and carrying out outreach projects: For several years the UA department of mathematics has had graduate students working directly with undergraduates on research projects.

- The high school calculus class visitation project and other outreach projects: Visiting high school calculus classes is becoming even more important if we are to encourage our students to pursue mathematical careers. David Bressoud (Macalester College) gave a talk at the latest meeting of the AMS/MAA in San Antonio in which he pointed out that more that 500,000 high school students are enrolled in AP calculus, roughly equal to the number of college students enrolled in first semester calculus. In the latest round of the calculus AP test, about 12,000 8, 9, 10, 11 grade students took the BC AP Calculus test (roughly this is second semester calculus). These are students who have not yet completed their senior year. That is more than the total number (~11,000) of undergraduate students earning bachelor's degrees in mathematics each year. Clearly this is a pool of students that should be going on in mathematics. Dorin Dumitrascu (dumitras@math.arizona.edu), a teaching Post-doc at the University of Arizona, is willing to organize this session.

- ConcepTests in teaching mathematics. Organized by Deborah Hughes-Hallett (dhh@math.arizona.edu).

Main Page

Meeting Contact:

William Y. Velez
Department of Mathematics
The University of Arizona
P.O. Box 210089
Tucson, AZ 85721-0089
Phone: (520) 621-2259
Fax: (520) 621-8322