Annual Meeting
Southwestern Section
Mathematical Association of America
April 1–2, 2005
University of Texas at El Paso

Invited talks

Two Research Traditions Separated by a Common Subject: Mathematics and Mathematics Education, **Annie and John Selden**, New Mexico State University. *Friday, 10:00 a.m., Tomas Rivera Conference Center.*

"There are no proofs in mathematics education." While this is true, claims are made in mathematics education research and evidence is provided for them. In this talk, we will explore the nature of such research, the kinds of claims and evidence, and what such research might have to offer teachers of mathematics, especially at the undergraduate level. Along the way, we will point out differences between the ways research is done in the two fields.

Why Things Go Quasi in Higher Dimensions, **Bruce Palka**, University of Texas at Austin, and editor of the American Mathematical Monthly. *Saturday, 8:30 a.m., Tomas Rivera Conference Center.*

The talk will discuss Liouville's 1850 theorem to the effect that there is a general paucity of conformal mappings in Euclidean spaces of dimensions three and higher – say, in comparison with the situation in the plane, where the Riemann mapping theorem ensures a wealth of conformal mappings.

Special sessions

How to Engage Students in Mathematics Deborah Hughes Hallett, University of Arizona, organizer. *Friday, 2:00–3:30 and 3:45-5:15, Barry room.*

This session will address a problem we all face: finding ways to capture students' interest and attention — an essential prerequisite to successful learning. The session will bring together MAA distinguished teaching award winners to share ideas and techniques. Comments and discussion from the audience are welcomed!

Bioinformatics Ming-Ying Leung, University of Texas at El Paso, organizer. *Friday, 3:45–5:15, Elkins room.*

The session will conclude with a 10 mins open discussion, led by Dr. Ming-Ying Leung on bioinformatics in general.

A sample of mathematics-centered educational and outreach activities at New Mexico State University Josefina Alvarez, New Mexico State University, organizer. *Saturday, 9:30–11:30, 1:00–3:00, 3:30–4:00, Elkins room.*

Mathematics Motivated by Computations: Case Studies Vladik Kreinovich, University of Texas at El Paso, organizer. *Saturday, 9:30–11:30.*

Friday

8:00 a.m.– 9:00 a.m.	Continental Breakfast
8:00 a.m.–10:00 a.m.	Registration
8:00 a.m.– 5:30 p.m.	Vendor exhibits and MAA book sales
9:00 a.m.–10:00 a.m.	Welcoming remarks
10:00 a.m.–11:00 a.m.	Invited address – Annie and John Selden
11:30 a.m.–12:30 p.m.	Contributed and student talks
12:30 a.m.– 2:00 p.m.	Lunch on your own
2:00 p.m.– 3:30 p.m.	Contributed and student talks
3:45 p.m.– 5:15 p.m.	Contributed and student talks
5:30 p.m.– 8:30 p.m.	Banquet
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Saturday

8:00 a.m.– 8:30 a.m.	Continental Breakfast
8:00 a.m.–10:00 a.m.	Registration
8:00 a.m.– 5:30 p.m.	Vendor exhibits and MAA book sales
8:30 a.m.– 9:30 a.m.	Invited address – Bruce Palka
9:30 a.m.–11:30 a.m.	Contributed and student talks
11:30 a.m.– 1:00 p.m.	Lunch on your own
1:00 p.m.– 3:00 p.m.	Contributed and student talks
3:30 p.m.– 5:00 p.m.	Contributed and student talks
4:00 p.m.– 5:00 p.m.	Business meeting, MAA Southwestern Section

FRIDAY, April 1

Tomas Rivera Conference Center

8:00 a.m.– 9:00 a.m.	**Continental Breakfast**
8:00 a.m.–10:00 a.m.	**Registration**
8:00 a.m.– 5:30 p.m.	**Vendor exhibits and MAA book sales**

Welcoming remarks
Tomas Rivera Conference Center, 9:00 a.m. – 10:00 a.m.

Mike Eastman, Dean, College of Science, University of Texas at El Paso.

Helmut Knaust, Chair, Department of Mathematical Sciences, University of Texas at El Paso.

Invited address
Tomas Rivera Conference Center, 10:00 a.m. – 11:00 a.m.

Two Research Traditions Separated by a Common Subject: Mathematics and Mathematics Education, **Annie and John Selden**, New Mexico State University.

Contributed talks
Barry room, 11:30 a.m. − 12:30 p.m.

11:30 *Algebraic Characterizations of Exponential Series*, **Emil Daniel Schwab**, University of Texas at El Paso.

12:00 *A Generalized "Problem of the Week"*, **Michael Ratliff**, Northern Arizona University.

Contributed talks
Elkins room, 11:30 p.m. − 12:30 p.m.

11:30 *Prior Knowledge and Mathematical Cognition*, **Hamide Dogan-Dunlap, Fan Chen (G),** and **Cristina Torres (G)**, University of Texas at El Paso.

12:00 *Capstone Courses for Future Secondary Mathematics Teachers*, **Matthew Winsor**, University of Texas at El Paso.

Student talks
Wiggins room, 11:30 a.m. − 12:30 p.m.

11:30 *A Numerical Galerkin Method and the Ginzburg Landau Superconductivity Model for Cooling in Thin Cylindrical Samples*, **Ty Thompson (G)**, Northern Arizona University.

12:00 *Numerical Comparison of Optimization Techniques for Solving a Nonlinear Hyperboloid Least Squares Problem*, **Brenda Bueno (U)**, University of Texas at El Paso.

Lunch on your own, 12:30 p.m. − 2:00 p.m.

SPECIAL SESSION
"How to Engage Students in Mathematics", Part I
Barry room, 2:00 p.m. − 3:30 p.m.

2:00 *Introduction: Characteristics of Successful Engagement: Examples from Calculus and Statistics*, **Deborah Hughes Hallett**, University of Arizona.

2:30 *The Mathematics Parole Board: Imaginary Scenarios that Provide Incentives for Students to Participate in Class*, **John Hagood**, Northern Arizona University.

3:00 *Applications and Mathematical Modeling*, **William Stone**, New Mexico Tech.

Contributed talks
Elkins room, 2:00 p.m. − 3:30 p.m.

2:00 *Learning Math Methods Online: Promises and Challenges for Teachers of Young Children*, **Ellen Treadway**, University of Texas at El Paso.

2:30 *Pi Day and Other Interventions: Real-life Research on Middle School Motivation*, **Larry Lesser, Sally Blake,** and **Paulette Adams (U)**, University of Texas at El Paso.

3:00 *Draw Infinity Project: Middle Grades Students' Concept Images of Infinity*, **Mourat Tchoshanov, Sally Blake,** and **Beverley Calvo**, University of Texas at El Paso, **Sue Spotts** and **Alex Bustillos**, Wiggs Middle School, and **Susie Villalobos (G)**, University of Texas at El Paso.

Student talks
Wiggins room, 2:00 p.m. − 3:30 p.m.

2:00 *Rectangular Polyomino Set $(1,2)$-Achievement Games*, **Edgar Fisher (G)**, Northern Arizona University.

2:30 *Dirichlet's Theorem: Revolutionizing Number Theory*, **Enrique Treviño (U)**, University of Texas at El Paso.

3:00 *Using Functions and Relations to Form Equations Defining Already Established Groups*, **Antony Adair (U)**, University of Texas at El Paso.

SPECIAL SESSION
"How to Engage Students in Mathematics", Part II
Barry room, 3:45 p.m. − 5:15 p.m.

3:45 *Using Exploratory Problems to Engage Students from Grade 4 to Grade 16*, **Fred Stevenson**, University of Arizona.

4:15 *KAW – Knowing, Asking and Writing*, **Janet McShane**, Northern Arizona University.

4:45 *How to Beat the Lecture/Textbook Trap! An Active Student Classroom via Student Reading, Writing, or Primary Historical Sources*, **David Pengelley**, New Mexico State University.

SPECIAL SESSION
Bioinformatics
Elkins room, 3:45 p.m. − 5:15 p.m.

3:45 *Bioinformatics: Convincing the Biology Major that Mathematics and Computer Science are Relevant*, **Steve Aley**, University of Texas at El Paso.

4:15 *Stochastic Models in Carcinogenesis Modeling*, **Li Deng (G)**, Rice University.

4:45 *The Computational Biosciences Professional Sciences Masters Program at Arizona State University*, **Rosemary A. Renaut**, Arizona State University.

Student talks
Wiggins room, 3:45 p.m. − 4:45 p.m.

3:45 *Predicting Student Performance on Exam Questions from Terminology Present on Concept Maps*, **Fan Chen (G)** and **Cristina Torres (G)**, University of Texas at El Paso.

4:15 *Are Pre-service Teachers Implementing Math Methods/Ideas Learned at the University Level in the Classroom?*, **Melinda Ramos Camarillo (G)**, University of Texas at El Paso.

Banquet
Tomas Rivera Conference Center, 5:30 p.m. − 8:30 p.m.

5:30 *Count Her In!*, a play about female mathematicians' lives, performed by high school students. Director: **Sherry Lowell-Lewis**, University of Texas at El Paso.

6:30 Dinner

7:30 *Math Song Sing-Along!*, **Dr. Larry Lesser**, University of Texas at El Paso. Resources related to Dr. Lesser's evening presentation are available at `http://www.math.utep.edu/Faculty/lesser/Mathemusician.html`

SATURDAY, April 2

Tomas Rivera Conference Center
8:00 a.m.− 8:30 a.m.   **Continental Breakfast**
8:00 a.m.–10:00 a.m.   **Registration**
8:00 a.m.− 5:30 p.m.   **Vendor exhibits and MAA book sales**

Invited address
Tomas Rivera Conference Center, 8:30 a.m. − 9:30 a.m.

Why Things Go Quasi in Higher Dimensions, **Bruce Palka**, University of Texas at Austin, and editor of the American Mathematical Monthly.

Contributed talks
Barry room, 9:30 a.m. − 11:30 a.m.

9:30 *Fixed Point Theory: Past, Present, and Future*, **Amine Khamsi**, University of Texas at El Paso.

10:00 *Fixed Point Theorems with Applications to Variational Inequalities*, **Behzad Djafari Rouhani**, University of Texas at El Paso.

10:30 *Nonlinear Boundary Conditions for Elliptic Equations*, **Osvaldo Mendez**, University of Texas at El Paso.

11:00 *Recovering a Function from a One-sided Derivative*, **John Hagood**, Northern Arizona University.

"A sample of mathematics-centered educational and outreach activities at New Mexico State University", Part I
Elkins room, 9:30 a.m. − 11:30 a.m.

9:30 *A New University Algebra and Geometry Course for Middle and High School Teachers*, **Patricia Baggett**, New Mexico State University, and **Andrzej Ejrenfeucht**, University of Colorado, Boulder.

10:00 *UBM: A Training Program for Research on the Interface of Mathematics and Biology at New Mexico State University*, **Mary M. Ballyk** and **William J. Boecklen**, New Mexico State University.

10:30 *Introducing Primary Historical Sources in Discrete Mathematics and Computer Science Curriculum*, **Guram Bezhanishvili, Joel Lucero-Bryan (G),** and **Karen Villaverde**, New Mexico State University.

11:00 *The Reversal Error and Its Influence on Physics Problem Solving*, **Elaine Cohen (G) and Stephen Kanim**, New Mexico State University.

Student talks
Tomas Rivera Conference Center, 9:30 a.m. − 11:30 a.m.

9:30 *MathTECHmatics Projects*, **Elizabeth Rayas (G)**, University of Texas at El Paso.

10:00 *Differences in Teachers' Choice of Technology and Its Implementation Amongst Ability-Grouped High School Math Classes*, **Cristina Torres (G)**, University of Texas at El Paso.

10:30 *Using Technology to Assist Students in Comprehension of Graphs of Linear and Quadratic Equations*, **Fariba Ansari (G)**, University of Texas at El Paso, and **Francisco Nolasco**, Chapin High School.

11:00 *Technology in the Geometry Classroom*, **Stella Woo (G), Sandra Kneeskern (G),** and **Miles Kettel (G)**, University of Texas at El Paso.

"Mathematics Motivated by Computations: Case Studies"
Wiggins room, 9:30 a.m. − 11:30 a.m.

9:30 *Fast Algorithm for Computing the Upper Endpoint of Sample Variance for Interval Data: Case of Sufficiently Accurate Measurements*, **Gang Xiang**, University of Texas at El Paso.

10:00 *Differentiation Beyond Traditional Definitions: Cases Studies of Application-motivated Extensions*, **Vladik Kreinovich**, University of Texas at El Paso, and **Hung T. Nguyen**, New Mexico State University.

10:30 *Egyptian Fractions Revisited*, **Olga Kosheleva** and **Vladik Kreinovich**, University of Texas at El Paso.

11:00 *Exploring Random Sets in Teaching Elementary Applied Statistics*, **Hung T. Nguyen**, New Mexico State University.

Lunch on your own, 11:30 p.m. − 1:00 p.m.

Contributed talks
Barry room, 1:00 p.m. − 2:30 p.m.

1:00 *Multiplicative Bases of the Algebra of Matrices*, **Piotr J. Wojciechowski**, University of Texas at El Paso.

1:30 *Counting Multiplicative Bases of the Algebra of Matrices*, **Carlos De la Mora**, University of Texas at El Paso.

2:00 *Eigenvalues of Combinatorial Laplacians*, **Art Duval**, University of Texas at El Paso.

SPECIAL SESSION
"A sample of mathematics-centered educational and outreach activities at New Mexico State University", Part II
Elkins room, 1:00 p.m. − 3:00 p.m.

1:00 *The Master of Arts in Teaching Mathematics Degree at NMSU*, **David R. Finston**, New Mexico State University.

1:30 *Students' Difficulties With the Concept of Tension*, **Sergio Flores (G)**, New Mexico State University.

2:00 *Lesson Study as a Tool for Professional Development*, **Catherine Kanim** and **Susana Salamanca-Riba**, New Mexico State University.

2:30 *Classroom Assessment Techniques to Improve the Pass Rate in an Intermediate Algebra Course*, **Shakir Manshad**, Doña Ana Branch Community College and New Mexico State University, and **Amal Mostafa** and **Linda Zimmerman**, New Mexico State University.

Student talks
Tomas Rivera Conference Center, 1:00 p.m. − 3:00 p.m.

1:00 *Students with Learning Disabilities and their Social Adjustments*, **Cesar Ramirez (G)**, University of Texas at El Paso.

1:30 *Attitude and Perception: Mathematics Learning*, **Jesus Jordan (G), Damian Pillatzke (G),** and **Gerald Smith (G)**, University of Texas at El Paso.

2:00 *The Effects of Doing Research on History of Mathematics*, **Claudia Liliana Talamantes (G)**, University of Texas at El Paso.

2:30 *The Effects of a History-based Mathematics Project on the Motivation and Appreciation of a Class of Geometry*, **Andrew N. Streeter (G)**, University of Texas at El Paso.

Contributed talks
Wiggins room, 1:00 p.m. − 3:00 p.m.

1:00 *Bayesian Variable Selection in Multinomial Probit Models to Identify Molecular Signatures of Disease Stage*, **Naijun Sha**, University of Texas at El Paso.

1:30 *Logistic Regression with Applications to Education*, **Peter Moschopoulos**, University of Texas at El Paso.

2:00 *It's a Holiday!!*, **Janet McShane**, Northern Arizona University.

2:30 *Project-Based Learning in Mathematical Statistics*, **Vera Ioudina**, University of Texas at El Paso.

Contributed talks
Barry room, 3:30 p.m. − 4:30 p.m.

3:30 *Halving Ham Sandwiches and Combing Hairy Spheres: Some Topological Aspects of Reality*, **Luis Valdez-Sanchez**, University of Texas at El Paso.

4:00 *Dimensions of Learning in Teaching Mathematics*, **Sharon Yu-Shattuck**, El Paso Community College.

SPECIAL SESSION
"A sample of mathematics-centered educational and outreach activities at New Mexico State University", Part III
Elkins room, 3:30 p.m. − 4:00 p.m.

3:30 *Mathematical Finance Course at New Mexico State University: Portfolio Optimization*, **Yang Liu (G)** and **Maria Cristina Mariani**, New Mexico State University.

Student talks
Tomas Rivera Conference Center, 3:30 p.m. − 4:30 p.m.

3:30 *Using Concept Maps to Improve Test Scores*, **Roger A. Winter (G)**, University of Texas at El Paso.

4:00 *The Effect of Teacher Collaboration on Student Performance*, **Jodi Copley (G), Joseph Blas (G),** and **Candace Warren (G)**, University of Texas at El Paso.

Contributed talks
Wiggins room, 3:30 p.m. − 5:00 p.m.

3:30 *Finding Extreme Points of a Finite Set Using Random Hyperplanes*, **Shafiu Jibrin**, Northern Arizona University.

4:00 *An Inexact Newton Interior-Point Method for Nonnegative Constrained Minimization*, **Miguel Argaez, Roberto Saenz (G), and Leticia Velazquez (speaker)**, University of Texas at El Paso.

4:30 *The Notion of the Quasicentral Path in Linear Programming*, **Miguel Argaez (speaker), Osvaldo Mendez,** and **Leticia Velazquez**, University of Texas at El Paso.

Business meeting, MAA Southwestern Section
Elkins room, 4:00 p.m. − 5:00 p.m.

Before you leave, please remember to turn in your ballot of student talks at the information table outside the Tomas Rivera Conference Center. Ballots turned in after Saturday will not be counted.

The MAA southwest section meeting is supported by:

- The El Paso Mathematics and Science Partnership funded by the National Science Foundation;

- The College of Science, University of Texas at El Paso;

- Mathematical Sciences Department, University of Texas at El Paso.

The play *Count Her In!* is partially sponsored by THOMSON Publishing.

The prizes for the best graduate and undergraduate presentations are provided by Wolfram Inc.