Keynote Speaker

Dr. Marilyn E. Strutchens, Professor of Secondary Mathematics Education, Department of Curriculum and Teaching, Auburn University

Career Panelists

Ms. Abbey Allen, Graduate Student/Teacher, Auburn University
Ms. Kendra Franklin, Engineer, Hyundai Motor Manufacturing
Ms. Kim Harruff, Environmental Biologist, TTL Engineering
Ms. Laila Hasan, Database/System Analyst II, Alabama Municipal Electric Authority
Ms. Shannon Lushington, Actuarial Analyst, Alfa Insurance
Ms. Ashley Megelin, Biologist/Chemist, TTL Engineering
Dr. Marilyn E. Strutchens, Professor of Secondary Mathematics Education, Department of Curriculum and Teaching, Auburn University
Ms. Tynisa Williams, Teacher, Marbury Middle School

Workshop Leaders

Dr. Mosisa Aga, Assistant Professor, Math Department, AUM
Mr. Joe Albree, Assistant Professor, Math Department, AUM
Ms. Abby Allen, Ph.D. Candidate, Mathematics, Auburn University
Dr. Scott Brown, Associate Professor, Math Department, AUM
Dr. W. Gary Martin, Professor, Curriculum and Teaching, Auburn Uni.
Dr. Luis Cueva-Parra, Associate Professor, Math Department, AUM
Dr. Cheng-Chi Huang, Associate Professor, Math Department, AUM
Dr. Rhodes Peele, Associate Professor, Math Department, AUM
Dr. Furman Smith, Associate Professor, Math Department, AUM
Mr. Luke Smith, Director, Instructional Support Lab, AUM
Dr. Anna Wan, Ph.D. Candidate, Mathematics, Auburn University
Dr. Yi Wang, Assistant Professor, Math Department, AUM

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AUM's 7th Annual Sonia Kovalevsky Mathematics Day

Program Organizers

Dr. Scott Brown
Dr. Enoch Lee
Dr. Joan Powell
Dr. Matthew Ragland
Dr. Luis Cueva-Parra Technology/Equipment
Dr. Yi Wang Technology/Equipment
Mrs. Freida Warren Career Panelist Moderator

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Workshops and Brief Abstracts

Dr. Mosisa Aga(1): *Alphametic Puzzles*, An alphametic puzzle (also sometimes known as a cryptarithm) is a type of puzzle where words are put together into an arithmetic formula such that digits can be substituted for the letters to make the formula true. In this presentation we will first introduce the definition and the Guiding Rules of the puzzle and then have fun with some (selected) easier such puzzles.

Dr. Mosisa Aga(2): *The Reluctant Witness: A Mathematical Solution to a Murder Mystery*, Paul, a wealthy man and owner of a private island, invites 16 of his associates to his home on the island for the weekend. Then Paul was murdered, certainly by one of his associates. A homicide detective John is brought in and puts the 16 suspects on lockdown while the murder is investigated. John makes an extensive investigation on the case and knows one thing for certain there is one and only one credible eye-witness at the murder scene, a trusted employee named Tara. He also found out that each of the 16 individuals have a perfect motive to murder Paul. Tara told the detective that she saw the murderer kill Paul. The problem facing detective John is that Tara is not willing to identify the murderer by stating a name or directly pointing to the individual; she fears retribution. In this talk we will use a mathematical method to help detective John identify the murderer without forcing Tara to directly point to the person.

Mr. Joe Albree: *Sonia Kovalevsky's Biography*, This workshop gives a brief account of the history of Sonia Kovalevsky and significance of her life and work.

Ms. Abby Allen: *Euler and the Seven Bridges of Königsberg*, If you were to rank the top mathematicians of all time, Leonhard Euler would definitely be in the top three. His work spanned many different disciplines within math and science, laying groundwork still used today in fields ranging from physics to geometry to number theory. Today we look at his problem about the Seven Bridges of Königsberg and how it led to the development of graph theory.

Dr. Scott Brown: *Mathematical Connections with Islamic Art*, A hands on workshop illustrating the connections between geometry and Islamic art.

Dr. Cheng-Chi Huang: *A New Look at Sketching Trigonometric Functions*, The traditional methods for sketching trigonometric functions have been suggested in the literature. A new method will be presented and the method may prove to be interesting and straightforward for many people.

Sonia Kovalevsky Day Program

Auburn Montgomery

February 27, 2010

Time	Event	Location
8:00–8:45	Registration & Refreshments	318 Goodwyn
8:45–9:15	Welcome	112 Goodwyn
9:25–10:15	**Keynote Address**	112 Goodwyn
	Dr. Marilyn E. Strutchens	
	Do Math and Change the World	
10:25–11:15	Workshop Session #1	← Descriptions →
	Dr. Scott Brown	202 Goodwyn
	Ms. Tynisa Williams	211 Goodwyn
	Dr. Rhodes Peele	219 Goodwyn
	Dr. Mosisa Aga	222 Goodwyn
	Dr. Yi Wang	319 Goodwyn
	Dr. W. Gary Martin	320 Goodwyn
11:30–12:00	Lunch	318/307 Goodwyn
12:10–1:00	Workshop Session #2	← Descriptions →
	Dr. Anna Wan	202 Goodwyn
	Dr. Luis Cueva-Parra	205 Goodwyn
	Ms. Tynisa Williams	211 Goodwyn
	Mr. Joe Albree	219 Goodwyn
	Dr. Mosisa Aga	222 Goodwyn
	Dr. Yi Wang	319 Goodwyn
1:10–2:00	Workshop Session #3	← Descriptions →
	Dr. Anna Wan	202 Goodwyn
	Dr. Furman Smith	205 Goodwyn
	Dr. Cheng-Chi Huang	222 Goodwyn
	Mr. Joe Albree	219 Goodwyn
	Ms. Abby Allen	319 Goodwyn
	Mr. Luke Smith	320 Goodwyn
2:10–3:00	Career Panel Discussion	112 Goodwyn
3:10–3:45	Door Prizes and Closing Remarks	112 Goodwyn

Workshops and Brief Abstracts

Dr. W. Gary Martin: *Appearances Can Deceive: Why Sampling Matters*, This workshop will explore how easy it is to draw questionable conclusions from data and approaches from statistics that can make help you draw more valid conclusions.

Dr. Luis Cueva-Parra: *Cellular Automata (CA): Mathematics without Numbers*, We introduce a different way of doing Mathematics. Instead of using Numbers and Operations we present Cells and Rules (Cellular Automata (CA)). CA "live" in a discrete space and its dynamical behavior is explored. Cells can be anything from geometrical shapes or figures to musical notes. Those cells will follow certain rules which we impose arbitrarily.

Dr. Rhodes Peele: *Hackenbush and other Blackboard Games* , We will discuss various two-person games that do not involve chance (e.g., no dice or coin tosses) that you can play on a blackboard. For some of these games a "perfect strategy" has been devised, while others remain "unsolved". We will pass out a list of websites so that you will be able to play several of the games over the internet against computers, as well as with your friends. We will also develop some of the mathematical theory of the "perfect strategy" games, and provide references for those who want to learn more.

Dr. Furman Smith: *Programming a Simple Video Game*, With use of the computer lab, this talk illustrates how to program a video game with the classic programing language Logo.

Mr. Luke Smith: *Is it possible to NOT get sick?*, This workshop discusses probability and the role probability plays in getting sick by catching viruses.

Dr. Anna Wan *Fold Them Up and Take Them Home* All too often we use geometric language for problems and in class assignments. How about we use them for something else? We'll use some familiar words we learned in geometry and fold origami with them. Some logic and geometric properties will be learned and used in this session.

Dr. Yi Wang: *Mathematics and Your Pictures: Digital Image Processing Fundamentals*, This workshop deals with the math behind your digital images.

Ms. Tynisa Williams: *Polygons, Polyhedrons and Polydrons Oh My!*, This hands on workshop discussing the regular three dimensional solids; the Platonic, Archmedian, and Johnson solids. Students will create the 5 Platonic solids using Polydron manipulatives; the Tetrahedron, the Cube or Hexahedron, the Octahedron, the Dodecahedron, and the Icosahedron. In addition, some Archmedian solids and Johnson solids will be made.