

Session 5A: Simons Auditorium

3:50 – 4:30 UTeach: Preparing 6500 students to teach secondary mathematics and science

- **Mike Marder** – University of Texas at Austin

Abstract: UTeach began at The University of Texas at Austin in 1997. It is a collaboration of mathematicians, scientists, mathematics and science educators, and master teachers. Over 800 students have now graduated, 90% have entered teaching, and 80% of those who entered have still been in schools after five years. In 2006, UTeach began to expand. 40 universities have now adopted the UTeach model, and 5 more will be selected in the summer of 2014.

I will discuss some of the design principles of UTeach and UTeach expansion, and explain why universities have such a critical role to play in preparing new generations of teachers.

4:35 – 5:15 Courses in a mathematics department that emphasize mathematical meanings for teaching mathematics

- **Pat Thompson** – Arizona State University

Abstract: Over the past two years we surveyed 260 high school mathematics teachers' meanings regarding fundamental ideas in the secondary mathematics curriculum. Results from this survey suggest the existence of a vicious cycle: Students leave high school with poorly formed meanings for ideas in the secondary mathematics curriculum, take math classes which assume that students have these meanings when they often don't, and then they return to the classroom as teachers of ideas that they understand about the same as when they left high school. I will draw from these findings to explain the specialized mathematics courses we have designed as part of a B.Sc. Mathematics degree for which the State of Arizona gives graduates a certificate for teaching secondary mathematics.

5:20 – 6:00 A course on making mathematical connections (for teachers and math majors)

- **Hyman Bass** – University of Michigan

Abstract: The school (and even college) mathematics curriculum efficiently organizes mathematics into distinct subjects, but students, even when academically successful, sometimes lose awareness of the unity and connectivity of mathematical ideas across domains. Sometimes this is because modest amounts of more advanced theory are needed to see these cross-domain connections clearly. Learning to make and see such connections is one of the aims of the course I will describe. The cognitive literature on learning suggests that making networks of connections is characteristic of deep understanding and of high problem solving skills. Another motivation for the course design arises from the observation that disciplinary mathematical practice is generally acknowledged to involve two modes of activity – problem solving and theory building. Theory building is a high level form of connection making and conceptual unification. While problem solving has a significant presence in the school curriculum, it is less clear whether the curriculum could include some credible, school appropriate, version of theory building. The course offers one learning activity that could serve as a kind of bridge between problem solving and theory building.

Session 5B: Baker Boardroom

3:50 – 4:30 Three specialized mathematics courses for teaching

- **Beth Burroughs** – Montana State University

Abstract: The major in mathematics with a teaching option at Montana State University includes, among other mathematics and education coursework, three specialized courses focusing on mathematics for teaching. The courses are titled Higher Mathematics for Secondary Teachers, Modern Geometry, and Mathematical Modeling for Teachers. Though the courses have been an essential part of our mathematics teaching program at MSU for nearly two decades, the *Mathematical Education of Teachers II* report has provided our faculty members the opportunity to reexamine the content and articulation of these courses. I will discuss some of our successes and challenges in teaching these courses and invite audience members' ideas and reactions.

4:35 – 5:15 The UC Berkeley teaching concentration for math majors

- **Ole Hald** – U. California, Berkeley

Abstract: the teaching concentration for math majors at UC Berkeley will be described, and some of the issues associated with teaching this class of students will be discussed.

5:20 – 6:00 Collaboration between mathematicians and mathematics educators at Sonoma State University

- **Brigitte Lahme** – Sonoma State University

Abstract: Mathematicians and math educators in the Math department and in the School of Education at Sonoma State University consistently collaborate on a variety of projects in preservice and inservice teacher education. These include co-teaching content courses for elementary and secondary preservice teachers, designing curriculum, and conducting grant funded professional development for teachers in Northern California under the auspice of the North Bay Math Project. In this talk I'll give an overview of the different components of our collaboration and how our work influences the mathematics and education community at our university.

Session 5C: Space Sciences Lab Addition Conference Room

3:50 – 4:30 The MTE-Partnership: Rethinking secondary mathematics teacher education

- **Cynthia Anhalt** – University of Arizona
- **Jim Lewis** – University of Nebraska-Lincoln
- **W. Gary Martin** – Auburn University
- **Michael Mays** – West Virginia University

Abstract: This session describes efforts by the Mathematics Teacher Education Partnership (MTE-Partnership) to develop interventions in critical areas of need in secondary mathematics teacher preparation. Speakers will provide brief overviews of efforts in four of these areas: improving clinical experiences, building mathematics courses for teacher candidates in alignment with the Mathematics Education of Teachers II, refocusing introductory mathematics courses to focus on active learning, and building effective recruitment and retention programs. The necessity for strong engagement by the mathematics community will be discussed, along with roles they are currently playing in each of these areas.

4:35 – 5:15 Three dimensions of course design for preservice secondary teachers

- **Cody Patterson** – U. Arizona

Abstract: In mathematics content courses for preservice secondary teachers, we aim to achieve three goals: build deep understanding of mathematical concepts that are central to grades K-12, develop awareness of connections among different mathematical ideas and perspective on the subject of mathematics as a whole, and stretch students' problem-solving skills by applying ideas from K-12 mathematics to rich, challenging problems. In this talk, I will present some examples of how this philosophy guides our design of a capstone mathematics course for preservice secondary teachers. I will present some activities in which we use topics and problems from K-12 mathematics to spark the development of stronger understanding and problem-solving skills and develop preservice teachers' identity as mathematicians.