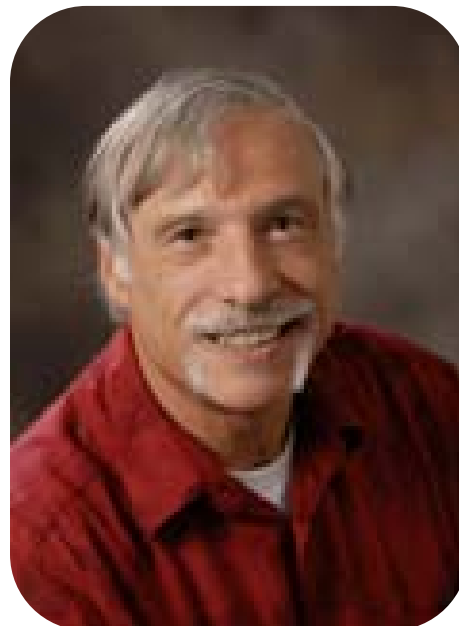


Featured Speakers

ARTHUR BAROODY...

received his Ph.D. in educational and developmental psychology from Cornell University in 1979. He is currently a Professor Emeritus of Curriculum & Instruction at the University of Illinois at Urbana-Champaign. He specializes in early childhood and elementary mathematics education. His research focuses on the teaching and learning of basic counting, number, and arithmetic concepts and skills by young children and children with learning difficulties. He is currently the Principal Investigator for a grant from the U.S. Department of Education ("Fostering Fluency with Basic Addition and Subtraction"; 7/1/2008–6/30/2012). He is also the Co-Principal Investigator for a grant from the National Institutes of Health ("Computer-guided Comprehensive Mathematics Assessment for Young Children"; 10/1/2005–9/30/2010) and an IES Post-doctoral grant from the U.S. Department of Education.



Dr. Baroody is the author of a number of books on teaching children mathematics, including *Fostering Children's Mathematical Power: An Investigative Approach to K–8 Mathematics Instruction* (published 1998 by Lawrence Erlbaum Associates), and is the co-author of the *Test of Early Mathematics Ability* (3rd edition; published 2003 by Pro-Ed). He co-edited a book with Ann Dowker (Cambridge University) on mathematical learning (*The development of arithmetic concepts and skills: Constructing adaptive expertise*), which part of the "Studies in Mathematics Thinking and Learning" series, edited by A. Schoenfeld and published by Erlbaum Associates in 2003.

Preparing for Algebra: A Purposeful, Meaningful, and Inquiry-Based Approach to Teaching Ratios and Proportions

Ratios, proportions, and algebra are major pitfalls for many students. Understanding ratios and proportions requires a major advance in mathematical thinking—thinking multiplicatively instead of additively. Algebra seems like a foreign language or even stranger—to many students. As one student woefully announced, "Algebra is wack [don't make sense] because math is about numbers, not letters." Ratios and proportions taught in an inviting, comprehensible, and thought-provoking manner can help students bridge the divide between additive and multiplicative reasoning and prepare a key foundation for algebra. The workshop will focus on how ratios and proportions can taught using a problem-solving approach, underscore key misconceptions about the topic, relate real-world proportional situations to formulas and graphs. It will include hands-on, student-centered activities.



DAVID BRESSOUD...

is a DeWitt Wallace Professor of Mathematics at Macalester College and President of the Mathematical Association of America. He served in the Peace Corps, taught at Penn State for 17 years, and chaired the Department of Mathematics and Computer Science at Macalester from 1995 until 2001. He has received the MAA Distinguished Teaching Award (Allegheny Mountain Section), the MAA Beckenbach Book Award for Proofs and Confirmations, and has been a Pólya Lecturer for the MAA.

He has published over fifty research articles in number theory, combinatorics, and special functions. His other books include Factorization and Primality Testing, Second Year Calculus from Celestial Mechanics to Special Relativity, A Radical Approach to Real Analysis (now in 2nd edition), A Radical Approach to Lebesgue's Theory of Integration, and, with Stan Wagon, A Course in

Computational Number Theory.

Issues of Transition to College Mathematics

Over the past quarter century, 2- and 4-year college enrollment in first semester calculus has remained constant while high school enrollment in calculus has grown tenfold, from 60,000 to 600,000, and continues to grow at 6% per year. We have passed the cross-over point where each year more students study first semester calculus in US high schools than in all 2- and 4-year colleges and universities in the United States. In theory, this should be an engine for directing more students toward careers in science, engineering, and mathematics. In fact, it is having the opposite effect. This talk will present what is known about the effects of this growth and what needs to happen in response within our high schools and universities.

MAURICE BURKE...

is a professor of mathematics education at Montana State University in Bozeman. He joined the faculty at MSU in 1988. He received his doctorate from the University of Wisconsin - Madison in mathematics and mathematics education. Between 1992 and 1996, he co-directed the SIMMS Project with Professor Johnny Lott of The University of Montana. He has been the director of MSU's online Master of Science in Mathematics - Mathematics Education Option (1998-2005) and recently served as the editor of the *Grades 9-12 Navigations Series* for the NCTM (2001-2008).

Dr. Burke is a proponent of the use of technology in the classroom ever since he first started using Apple computers to teach mathematics at West Bend High School in 1980. He frequently publishes technology-related articles in the *Mathematics Teacher*.



The Common Core State Standards for Mathematics: The Role of Technology and the Challenge of Inquiry

The Common Core State Standards for Mathematics, adopted by the State of Kentucky and many other states, open the curriculum to uses of technology that greatly broaden current practice. The role given to technology, however, also challenges us to embed inquiry as a matter of common practice in the classroom. Examples from each of the five high school content domains will be shared along with a summary of what is implied for grades K-8. The presentation concludes with a summary of implications for teacher preparation and professional development.

ANTONIA CAMERON...

served as Co-Director with Cathy Fosnot of Mathematics in the City (MitC), a national center for professional development at City College of the City University of New York. As co-principal investigator of a NSF-funded project, she co-authored fifteen facilitator guides for the Math in the City professional development series including CD-ROMS demonstrating the extraordinary teaching and learning she and her colleagues cultivated in the teachers they coached. In addition, she co-authored two units (*Games and Muffles' Truffles*) in the curriculum, *Contexts for Learning* published by Heinemann.

Ms. Cameron's groundbreaking, rigorous and highly effective professional development model for coaches in NYC evolved from her work as Director of the math component of the New York City Department of Education's *Collaborative Communities of Practice* project (2004-2006) and her creation of a collaborative coaching community (2003-2006) with Carol Teig, the Director of Mathematics in the former Region 8, Brooklyn, New York. In both projects, Ms. Cameron developed lab-site schools where hosting teachers and coaches shared their practice by opening their classrooms to participating coaches, teachers and administrators from other schools. This model of professional development is based on a lesson-study scenario where the process of planning, co-teaching and debriefing a lesson is used to examine and deepen both content and pedagogical content knowledge. Antonia's highly effective twist to the lesson study work focuses on "coaching the coach" and conversations center on highlighting effective coaching moves that support teacher development.

Ms. Cameron is in demand as "coach of coaches" by educational coaches in districts across the USA and Canada. She has presented nationally and internationally at such conferences as NCSM, NCTM, AMTE, NSDC and ICME.

Walking the Talk: Creating Robust Student Discourse in K-3 Classrooms

Where are children's voices in our classrooms? Why are so many children silent learners? How does this silence affect learning? If discourse is critical to the development of students' mathematical reasoning, how do coaches and teachers improve student talk in classrooms? In this session, we will focus on the process standards in mathematics to examine how specific talk moves generate rich academic discourse. We will also explore how to use discourse techniques to differentiate without lowering the standards for special needs and second language learners. Video, handouts, and techniques will be shared.

PETER GOULD...

is the Chief Education Officer in Mathematics with the NSW Department of Education and Training. His primary responsibilities are in the design and delivery of effective mathematics curriculum support from Kindergarten to Year 12. He has a strong interest in research-based knowledge being used to improve, and be improved by, teaching practice.



He taught mathematics classes for 13 years in disadvantaged secondary schools as well as Technical And Further Education and University courses. Peter has worked as a Kindergarten to Year 12 Regional Mathematics consultant and acknowledges that his students and colleagues have taught him many useful things over the years. He has written a range of curriculum documents including *Problem of the Week*, *Co-operative Problem Solving in Mathematics Years 5-8* and *Fractions: pikelets and lamingtons*. Peter has been the chair of several syllabus committees in NSW, helped in supporting the writing of the primary mathematics curriculum in Papua New Guinea and the *Count us in* children's television series for the ABC (Australian Broadcasting Corporation). His current research is into how children develop a sense of fractions, as well as what can be learnt from Lesson Study in mathematics.

Developing Understanding: Students Linking Area and Number to Reason About Place Value

We often ask students to make a drawing to help solve a problem. Yet all drawings are not equally helpful. What types of drawings are most helpful? When students can represent whole-number products as rectangular areas in mathematical reasoning they have a very powerful mathematical tool. We asked a Year 6 teacher if her students could use their understanding of the structure of rectangular arrays and area to reason about place value. What we discovered was that using area drawings is an effective way for students to reason about place value and to generalize their reasoning.



MARGARET MOHR-SCHROEDER...

joined the University of Kentucky faculty in 2006 as an assistant professor of mathematics education where she is the chair of the secondary mathematics education program. She holds a BSEd and MS in Mathematics from Pittsburg State University, and a Ph.D. in Curriculum and Instruction – Mathematics Education from Texas A&M University. As a native of Kansas, she began her career as a junior high, high school, community college, and college mathematics instructor. Since her arrival to UK, Dr. Mohr-Schroeder has been involved in over \$13 million in NSF funding, expanding STEM Education through various initiatives including the Science and Mathematics Teacher Imperative (SMTI), and has been instrumental in

garnering internal and external funding to support transdisciplinary teacher preparation. When she is not boating, camping, or using her mathematical abilities to remodel her home, she enjoys researching pre-service teacher Mathematics Education, Mathematics Knowledge for Teaching, and Assessment.

Increasing the Probability of Hitting a Moving Target: Transdisciplinary Teacher Preparation for Tomorrow's Careers

Effective competition in a rapidly growing global economy places demands on society to produce individuals capable of higher-order critical thinking, creative problem solving, connection making, interdisciplinary skills, and innovation. In response to these demands, various organizations throughout the United States have created and published various initiatives and even standards for what we should expect of our P-20 students and how our classroom teachers should promote achievement. Within the ever-changing context of today's society, we must look to our teacher education programs to help prospective mathematics teachers build mathematics habits of mind. It is imperative tomorrow's teachers promote a conceptually indexed, broad-based foundation of mathematics knowledge for teaching. Instrumental teaching encompasses the establishment and strengthening of the transdisciplinary connections and demands of today's society. Dr. Mohr-Schroeder will discuss the need to create and modify transdisciplinary teacher education programs, what challenges the new mathematics and science standards create for new teachers and our teacher education programs, and what effect these changes will have on students as they are prepared for post-secondary education and their careers.



SALLY MOOMAW...

is an Assistant Professor of Early Childhood Education at the University of Cincinnati. Much of her research and teaching is in the area of STEM education (science, technology, engineering, and math). She received her doctoral degree in special education from the University of Cincinnati in 2008 following a long career as a preschool teacher and as the Associate Director for Professional Development at the college's Arlitt Center. She is the author of fourteen books on early childhood curriculum, including *More Than Counting*. She designed a Mathematics Tool Kit for the Ohio Department of Education to help teachers implement state content standards, and has presented numerous workshops for colleges, school districts, and conferences throughout the country. Her previous degrees include a Bachelor of Music Degree and a Master's Degree in Child Development, both from the University of Cincinnati.

Addition in Preschool: It's Everywhere in the Classroom - or Can Be!

Children in math-rich environments often begin to transition into addition before they leave preschool. How do children progress from quantifying simple sets to early addition? What helps them make this transition? What may hinder it? What is the role of play experiences? Research documenting trajectories in early addition development will be explored and connected to classroom materials and environments.

ANN SHANNON...

is currently the Principal of Ann Shannon & Associates, LLC. In December 2009, Ann Shannon was awarded a contract from the Bill and Melinda Gates Foundation to design and deliver professional development for teachers as part of the Foundation's College Ready Strategy.

The expertise Ann brings to the advisory board includes a professional history of designing materials for use in K-12 schools. She has designed mathematics lessons, mathematics assessments, and professional development for K-12 teachers. Most recently, Ann contributed mathematics tasks that are intended to illustrate the new *Common Core State Standards*. Ann holds a B.A. in Mathematics and a Ph.D. in Mathematics Education from Keele University, Staffordshire, England.



Designing Assessment for Learning Professional Development that is Especially for High School Mathematics

Replicable strategies and techniques for engaging high school students in a “productive struggle” with mathematics will be introduced. In this highly interactive session, Dr. Shannon will introduce lessons that have been funded by the Bill and Melinda Gates Foundation. Participants will have the opportunity to see how formative assessment can transform the learning of high school mathematics.

DAVID WEBB...



is an assistant professor of mathematics education and is also the Executive Director of [Freudenthal Institute USA](#), an international research collaborative for mathematics education. Dr. Webb's research interests are in the areas of the preparation of mathematics teachers, classroom assessment, and the design of professional development activities. Recent research projects have focused on studies of teacher change in classroom assessment, the impact of reform curricula on student learning and achievement, and teacher design and use of formative assessment tools.

Using Representational Pathways to Increase Student Access to and Understanding of Mathematics

Math educators at Freudenthal Institute USA have used the Iceberg Model to support teacher thinking about learning processes and the development of student strategies. This approach has since been used with elementary, middle, and high school teachers in Colorado, Wyoming and elsewhere to support instructional decisions and formative assessment. At the heart of this approach are representational pathways that integrate students' prior knowledge and mathematical models to make connections and support student understanding of mathematics. This interactive keynote will provide an overview of this approach and offer suggestions to support instruction, assessment, and selection of appropriate interventions for struggling students.