BROADENING GRADUATE EDUCATION
Friday, March 10
3:45-5:00

1. Institutionalizing Broader Participation in the Mathematical Sciences
   Led by: Edray Goins, Associate Director, Math Alliance; David Goldberg, Executive Director, Math Alliance; Phil Kutzko, Director, Math Alliance; Helena Noronha, Director, Pacific Mathematics Alliance
   Workshop summary: Our profession has benefited greatly from the commitment and hard work of individuals and groups of individuals toward increasing the participation in the mathematical sciences of students and faculty from underrepresented backgrounds. One goal of the Math Alliance (www.mathalliance.org) is to institutionalize and then scale up these efforts. This workshop will begin with a brief description of the present state of the Math Alliance including our efforts to build regional alliances. We will then facilitate a discussion of how the Alliance might partner with math sciences departments and faculty and of what our goals as a community might be in this area.
   Preparation: The Alliance website is a good place to start: www.mathalliance.org. We are updating our website right now and will send you the links to the individual updated sections on Monday. These will provide very specific information about the Alliance and its programs. Information about the regional alliance that Helena runs may be found at http://www.pacificmathalliance.org/. We also have a regional alliance in the Gulf States: https://www.math.uh.edu/gsmath/.

2. Teaching Math / Teaching Students: Reconceptualizing professional development for teaching
   Led by: Dave Kung, Professor of Mathematics, St. Mary’s College of Maryland; Director, MAA Project NExT; & Natasha Speer, Associate Professor of Mathematics Education, University of Maine
   Workshop summary: College math teachers are increasingly asked to interactively engage with their students in class. What’s behind this push (which includes TPSE)? What does it mean for our departments? What professional development should we be providing to our graduate students, our new faculty, our adjuncts and (gasp!) our experienced tenure-track faculty? In this session, we’ll interactively explore these questions and provide resources for moving forward.
   Preparation: I think everyone teaching STEM in higher ed should read the Freeman Report: http://www.pnas.org/content/111/23/8410.abstract
3. **Introducing the BIG Math Network: practical ideas to connect academic departments with Business, Industry and Government**  
   **Led by:** Rachel Levy, Professor of Mathematics and Associate Dean for Faculty Development, Harvey Mudd College and Vice President for Education, SIAM  
   **Workshop summary:** Many undergraduate and graduate students trained in the mathematical sciences will enter the workforce in a rich array of business, industry and government (BIG) careers. The BIG Math Network (bigmathnetwork.wordpress.com) is a collaborative effort among math societies, institutes, and industry partners to aggregate information about internships, training, mentoring and jobs. Departments can have tremendous impact by raising awareness of the skills and experience required in today’s job market. In this workshop we will (a) discuss impactful initiatives (b) exchange ideas about successful departmental programs (c) identify departmental needs and (d) prioritize achievable action items. Participants will leave with an individualized institutional plan.  
   **Preparation:** Participants could browse the material at https://bigmathnetwork.wordpress.com.

4. **Linking Lower-Division and Upper-Division Pathways**  
   **Led by:** Dean Allison, Professor and Director, School of Mathematical Sciences, University of Northern Colorado; & Rick Miranda, Provost and Executive Vice President, Colorado State University  
   **Workshop summary:** As math departments strengthen and modernize their upper-division programs, how can we ensure that our lower-division pathways provide adequate preparation for these new offerings? In particular, what are the implications for the ways we currently organize our calculus program? How do we ensure that other pathways, for example through statistics, prepare students adequately for continuing education in mathematics? Participants will engage in discussion and facilitated activities to surface areas of opportunity and concern, and identify questions for further investigation.  
   **Preparation:** Participants are asked to read these two short documents:  
   Mathematics Pathways Brief http://bit.ly/2mQji6q  

5. **Teaching at a Community College: What Graduate Students Need To Be Prepared**  
   **Led by:** Laura Watkins, Past Project ACCCESS Coordinator  
   **Workshop summary:** Nearly half of all undergraduate students in the US that pursue a college education attend a community college at some point during their education. This statistic is not surprising considering community colleges have affordable tuition rates and the responsibility of educating the wide variety of students from the community, including recent high school graduates to adults seeking a career change. Discussion in this workshop will focus on how to prepare graduate students to successfully transition from graduate school to a challenging, yet rewarding, career teaching at a community college.  
   **Preparation:** None necessary.
NEW TEACHING STRATEGIES
Saturday, March 11
9:15-10:45 & 11:00-12:30

1. **SEMINAL: A grant aimed at helping institutions develop and maintain active learning in the P2C2 sequence**
   
   **Led by:** Allan Donsig, Vice Chair, Department of Mathematics, University of Nebraska—Lincoln; David Grant, Professor, Department of Mathematics, University of Colorado Boulder; & Michael O’Sullivan, Chair, Department of Mathematics and Statistics, San Diego State University
   
   **Workshop summary:** SEMINAL is a 5-year $3,000,000 collaborative NSF grant studying institutional change aimed at implementing active learning in undergraduate mathematics learning environments, particularly the pre-calculus to calculus 2 (P2C2) sequence; see [www.aplu.org/seminal](http://www.aplu.org/seminal). After case studies of six institutions that have already done this, nine institutions will be selected to complete longitudinal, incentivized case studies as they infuse active learning into their P2C2 sequences.
   
   Current and former math department leaders from the core institutions (the University of Colorado Boulder, San Diego State University, and the University of Nebraska-Lincoln) will briefly discuss how active learning has been implemented in their P2C2 sequences. Participants will then discuss opportunities for implementing changes in their own departments, and begin to develop a strategy for moving forward.
   
   **Preparation:** None required; pre-thinking recommended.

2. **Corequisite Remediation and Math Pathways in the Tennessee Board of Regents**
   
   **Led by:** Tristan Denley, Vice Chancellor for Academic Affairs, Tennessee Board of Regents
   
   **Workshop summary:** This workshop will present the recent work in TBR in transforming developmental education using the co-requisite model and the introduction of aligned math pathways. In its first year, 55 percent of co-requisite remediation math students passed their credit-bearing math class in the fall semester—compared to the 12 percent who previously managed that in a full year. We will present the most recent results, and discuss the implementation process as well as next steps to produce future improvements. Participants will have an opportunity to explore the implication of this work for their institutions.
   
   **Preparation:** None necessary.

3. **How to Increase Cognitive and Affective Gains in Student Performance**
   
   **Led by:** Autar Kaw, Professor of Mechanical Engineering, University of Southern Florida
   
   **Workshop summary:** We will discuss several evidence-based strategies to improve student performance and success as they progress through their curriculum. The use of technology and departmental commitment to accomplish this goal will be illustrated. Several pedagogies including blended, flipped, and adaptive learning will be discussed. As has been shown by several studies, affective learning and good teaching are equally important in ensuring student retention and success. Tools such as discussion of misconceptions, peer-to-peer learning, and universal design for learning to accomplish this will also be discussed.
   
   **Preparation:** No reading is required or suggested. I would like participants (chairs) to be familiar with their own departmental faculty’s grading policies, in-class strategies, and assessment techniques.
Led by: Frank Savina, Course Program Specialist, Mathematics, Higher Education, The Charles A. Dana Center  
Workshop summary: This session explores the Dana Center’s approach to transformational change in the first two years using mathematics pathways. Participants will engage in interactive activities designed to explore pathways course materials—specifically, the pathway to calculus.  
Preparation: None necessary.

5. Modernizing Math Pathways for Student Success: Network Nationally and Plan Locally  
Led by: David May, Project Director for Advancing Mathematics Pathways for Student Success, Association of Public and Land-grant Universities; and Heather Ortiz, State Implementation Specialist in Higher Education, The Charles A. Dana Center at The University of Texas at Austin  
Workshop summary: Developmental and gateway mathematics courses pose a significant barrier to student success for millions of students. Carefully designed math pathways can shorten course sequences and eliminate the mismatch between math content and a student’s program of study. Many have taken steps to move away from College Algebra for non-STEM students and develop rigorous sequences in statistical or quantitative reasoning more suited to different majors.  
In this interactive session, participants will learn about strategies for modernizing math pathways, with a specific focus on how to get started locally and connect with and get support from a new national network.  
Preparation: No required reading, but these two short documents are relevant and useful: Making the Case for Math Pathways (PDF) http://bit.ly/2ldvCSc  

6. Teaching Mathematics Using Inquiry  
Led by: Christine von Renesse, Associate Professor, Westfield State University  
Workshop summary: In this workshop, participants will first experience mathematical inquiry as students. We will then use this shared experience to reflect and think about teaching tools needed to create a classroom environment where productive, safe, and deep mathematical inquiry can take place. If time permits we will use classroom videos to reflect more deeply on the interaction of teacher, student, and inquiry materials in the classroom.  
See also: Discovering the Art of Mathematics -- www.artofmathematics.org.  
Preparation: Reading some of our blogs at www.artofmathematics.org/classroom would be helpful but it is not necessary.
7. Developing a Strategic Plan to Create a More Inclusive and Welcoming Department  
   Led by: Darryl Yong, Professor of Mathematics, Harvey Mudd College, Director of Claremont Colleges Center for Teaching and Learning  
   **Workshop summary:** This workshop will engage participants in reflection and sharing to develop concrete ideas for department change to enhance diversity and inclusion. A framework for inclusivity in STEM departments (based on James A. Banks’s Five Dimensions of Multicultural Education) will help participants to be strategic. The goal is for participants to walk out of the workshop with a set of next steps to pursue.  
   **Preparation:** If possible, please gather strategic documents for your department and institution. These could be strategic plans, vision statements, mission statements, a diversity/inclusivity statement, etc. Print out two sets of these documents for use during the workshop. We will need a few folks to help scribe—a laptop computer will be needed for that task.

8. Promoting Student Engagement with the MAA Instructional Practices Guide  
   Led by: Linda Braddy, Vice President for Academic Affairs, Tarrant County College; and Doug Ensley, Deputy Executive Director, Mathematical Association of America  
   **Workshop summary:** During the development of the most recent Curriculum Guide from the MAA Committee on the Undergraduate Program in Mathematics (CUPM), the MAA determined that a companion guide on instructional practices was in order. This ongoing two-year effort seeks to document research and evidence-based practices on the processes of Course Design, Assessment, and Classroom Practices that form and reinforce effective teaching through active learning and student engagement. This workshop will involve participants in an active conversation about the foundations of this project and will share some of the working drafts for discussion.  
   **Preparation:** We suggest participants look at the new MAA blog:  
   [http://maateachingtidbits.blogspot.com/](http://maateachingtidbits.blogspot.com/)  
   The particular posts that best illustrate this workshop’s content are  