Schedule of Plenary Speakers & Special Parallel Session

The plenary speakers for the 2017 ISMAA Annual meeting are:

- **Susanna Epp (DePaul University)**
- **Doug Shaw (University of Northern Iowa)**
- **Bob Cappetta (University of Illinois at Chicago)**
- **Laura DeMarco (Northwestern University)**

Special Session Abstract

Crucial teaching skills include being able to listen completely, react quickly, and to make bold choices. Many teachers who have had improv instruction discover that it transforms their teaching. Applied Improvisation has come into its own in the past several years, even being cited in medical journals. This experimental session will help you learn to teach "in the moment." The fact that it will also be Fun is an unavoidable byproduct of the work, and we apologize in advance. It is led by Professor Douglas Shaw, and builds on work he has done with the Applied Improvisation Network.

Pre-registration link below (session limited to 20 participants):

http://www.signupgenius.com/go/10c0b48aaa82ca4fe3-workshop

Plenary Abstracts

Title: **A Helpful Way to Think of Mathematical Variables**

Speaker: Susanna Epp, DePaul University

Abstract: Felix Klein wrote in 1908 that "one may well declare that real mathematics begins with operations with letters," and Alfred Tarski wrote in 1941 that "the invention of variables constitutes a turning point in the history of mathematics." In this talk I will discuss a way to think of variables that can help students avoid a variety of mathematical misunderstandings.

Title: **A Non-Imaginary Approach to Complex Numbers**

Speaker: Douglas Shaw, University of Northern Iowa

Abstract: All of us introduce complex numbers to students this way: Take the real numbers, throw in the ridiculous square root of negative one, then duck. Actually, most of us THINK of them this way – Complex numbers are the field extension of the reals when you add in the square root of negative one. When students question the existence of the square root of negative one, our responses come in two flavors, both annoying. In this talk we show how engineers think of complex numbers, and the square root of negative one is not needed to define them. This is a fun talk that will involve people being punched repeatedly in the face, a picture of the Enterprise, and a surprisingly relevant quote from Taylor Swift.

Title: **Teaching Calculus in the 21st Century**

Speaker: Robert Cappetta, University of Illinois at Chicago

Abstract: Calculus has not changed much in recent years but the way it is being taught certainly has. Much of this is driven by emerging technology and moving away from student memorization to conceptual understanding and non-routine problem solving. As more students will need calculus, managing the challenging issues of limited student interest, poor preparation and inadequate study habits will become crucial. Calculus is the gateway for students into STEM disciplines so the importance of these courses is clear. This presentation will examine some of these issues and begin to suggest some solutions. Attendees will be encouraged to share ideas.

Title: **The Mandelbrot Set: What We Know Today**

Speaker: Laura DeMarco, Northwestern University

Abstract: The Mandelbrot set is one of the most famous objects in modern mathematics. We see images of it everywhere, but despite its popularity and decades of research, we still don't fully understand it. I will survey results about the Mandelbrot set, from its discovery to today.