

Saturday, June 16, 2007

Sat. 9:15 - 10:30 AM

Keynote

Room

“From Functional to Pedagogical Use of CAS”

Kaye Stacey, *University of Melbourne, Victoria, Australia*

When teachers first teach with CAS, they mainly see its functional uses and how it gives answers to problems. As teachers gain experience, they see its pedagogical uses, for developing concepts, enhancing students' problem solving and encouraging exploration of mathematics. I will report how some teachers made these important transitions.

Sat. 10:45 - 11:45 AM

Classroom

Room

“Teaching Rational Functions with CAS”

Beth Ann Ball, *Maine South High School Park Ridge, IL*
Erin Briody, *Maine South High School, Park Ridge, IL*

This is a stand alone unit on graphing rational functions using CAS. CAS technology is used to explore vertical asymptotes, end-behavior asymptotes of degree one and greater, and other special features of these graphs. This unit also includes developing the concept of limit.

Sat. 10:45 - 11:45 AM

Classroom

Room

“Developing Language Skills & Mathematical Literacy with CAS”

Rebecca Bell, *Marble Hill School for International Studies, Bronx, NY*
Roger Brown, *University of Bath, UK*

This presentation demonstrates how handheld CAS devices can be used to support language development of English Language Learners. We will report on work undertaken in an urban high school whose population consists of approximately 40 different nationalities, many of whom are not yet proficient in English and some whose mathematical skills exceed their English language proficiency.

Sat. 10:45 - 11:45 AM

Classroom

Room

“Assessment with CAS: Writing Tests for CAS-capable Students”

Michael Buescher, *Hathaway Brown School, Shaker Heights, OH*

When students have CAS, how do we change the kind of questions we ask on tests and quizzes? What skills should we de-emphasize, and which are still important? What new solution methods materialize? How should students document the work they do on a machine? CAS-active Algebra 2 and Precalculus questions and student responses will be shared.

USACAS 2007 Program Abstracts (Tentative)

Sat. 12:45 - 1:45 PM

Classroom

Room

“CAS and the TI-89 Used to Scare Me, But Now They Are Empowering My Students!”

Mary Wiltjer, *Oak Park-River Forest High School, Oak Park, IL*

Just like you, I used to think that computer Algebra Systems (CAS) were going to allow my students to stop learning Algebra. I was wrong. Instead, the use of CAS is freeing up time, firing up my students' attitudes, and letting them fly further algebraically than I'd ever dreamed. This session will include lessons that Algebra, Advanced Algebra or Pre-calculus classes can use.

Sat. 2:00 - 3:00 PM

Classroom

Room

“Modelling Problems with TI-Nspire”

Philippe Fortin, *Lycée Barthou, PAU, Bizanos, France*

During this session, we will study some exercises recently submitted at the experimental new math test introduced in 2007 at the Baccalaureat National exam (This is the main national exam in France, at the end of Senior High School. Success on this exam is mandatory to continue studies at the University level). The introduction of this new math test, fully based on the use of math software, should drastically change the practices in math teaching in France in the very next years. The study of those exercises and modelling problems will be done using the TI-Nspire new platform, experimented in several pilot classes this year.

Sat. 2:00 - 3:00 PM

Technology

Room

“Interactive Math with Mathematica”

Faisal Mohammed, *Wolfram Research, Inc., Champaign, IL*

Mathematica is an elegant and robust computer algebra system that is widely used in research and development fields. You can use utilize this software to create an interactive classroom environment from the perspective of both the teacher and students. With it you can produce tests, quizzes, demonstrations and even an entire course syllabus.

Sat. 2:00 - 3:00 PM

Issues

Room

“Exploring Rich Mathematical Topics Using CAS”

James Schultz, *Ohio University (retired), Athens, OH*

Class-tested mathematical explorations with CAS as an indispensable tool in grades 7 - 12 will be shared. These activities can be used to enhance the curriculum by providing exposure to interesting mathematical topics and experience with powerful hand-held and computer software versions of technology, including the TI-89 (or Voyage 200) and TI-nspire.

USACAS 2007 Program Abstracts (Tentative)

Sat. 2:00 - 3:00 PM **Technology** Room

“Using Symbolic Geometry and CAS to Bridge the Gap Between Geometry and Algebra”

Philip Todd, *Saltire Software, Beaverton, OR*

An interactive symbolic geometry system such as "Geometry Expressions" allows the student to input geometric figures and output algebraic expressions. We demonstrate how this functionality in combination with a CAS can be used to isolate the strategic from the tactical aspects of problem solving and make geometry relevant to algebra.

Sat. 2:00 - 3:00 PM **Technology** Room

“An Introduction to Using CAS and the ClassPad”

Diane Whitfield, *Casio MRD Center, Portland Community College, Portland, Oregon*

During this hands-on session, participants will learn how technology can help everyone visualize mathematics. Following a brief introduction, we will provide step by step instructions on using the ClassPad to explore finding the golden ratio using CAS, Geometry and other applications. Beginners are welcome.

Sat. 2:00 - 3:00 PM **Research** Room

“Focusing on CAS and Mathematical Generalizations: Good Problems and Great Practices”

Rose Mary Zbiek, *The Pennsylvania State University, University Park, PA*

Generalizations are a key aspect of mathematics that, for many reasons, often escapes our students' attention. This session focuses on CAS-appropriate problems and practices that we can use in various courses to enhance our students' awareness and understanding of generalizations and students' ability to reason through and with mathematics.

Sat. 3:15 - 4:15 PM **Teacher Panel** Room

“CAS-Active Curriculum Teacher Panel”

Michael Buescher, *Hathaway Brown School, Shaker Heights, OH*

Doreen Kilday, *Arlington High School (retired), Alington, MA*

James Malts, *Price Laboratory School, Cedar Falls, IA*

Robert McCollum (moderator), *Glenbrook South High School, Glenview, IL*

The panelists, all of whom are teachers of U.S. CAS-active curriculum developers, will each provide brief summaries of such issues as the challenges of teaching a CAS-active curriculum, how CAS affects content, teaching style, assessment, management, student attitudes and some lessons learned from their efforts. There will be an opportunity for questions from the audience.

USACAS 2007 Program Abstracts (Tentative)

Sat. 3:15 - 4:15 PM **Technology** Room

“Uses of the TI-89 in the Teaching and Learning of High School Mathematics”

Don Porzio, *Illinois Mathematics and Science Academy, Aurora, IL*

Participants will engage in hands-on activities designed to use the TI-89 and its CAS capabilities in explorations and assessment, and discuss issues concerning when to use, and not use CAS. Calculators provided.

Sat. 3:15 - 4:15 PM **Research** Room

“Tested Approaches Using CAS in High School Algebra”

Kevin Waterman, *Educational Development Center, Newton, MA*

Certain “habits of mind” lead to algebraic proficiency across the grades, and Computer Algebra Systems can help develop these habits. Among other things, we will look at field-tested approaches to using CAS to:

- solve algebraic equations
- factor and expand polynomials
- look for patterns
- understand functional language
- make sense of iterative definitions of function

These approaches are being implemented in the CME Project, a new NSF-funded, four-year high school program, forthcoming from Pearson Prentice Hall.

Sunday, June 17, 2007

Sun. 8:30 - 9:30 AM **Classroom** Room

“CAS to Teach Algebra I”

Michelle Eggerding, *Schaumburg High School, Schaumburg, IL*

Using CAS helps enhance the algebra students learn and increase their involvement in developing their own mathematical reasoning. In the classroom, CAS opens the door to more mathematics to more students. Activities will include work with like terms, solving equations, exponent properties, and polynomial operations.

Sun. 8:30 - 9:30 AM **Technology** Room

“Using the Power of an Intergrated Mathematics Software Package to Improve Student Understanding”

Wade Ellis, *West Valley College, Saratoga, CA*

The TI-Nspire computer-software/handheld-calculator package integrates computer algebra, function graphing, interactive geometry, and a spreadsheet to provide a platform for the development of mathematical environments. The presentation will demonstrate how students can use such environments to improve their understanding of mathematical ideas and skills in precalculus and calculus.

USACAS 2007 Program Abstracts (Tentative)

Sun. 8:30 - 9:30 AM **Research** Room

“Symbolic Reasoning and Use of CAS”

M. Kathleen Heid, *The Pennsylvania State University, University Park, PA*

Recent research has shed light on CAS use in secondary classrooms. It is increasingly important that students develop not only symbolic manipulation but also symbolic reasoning. This presentation will draw on current research and theory to discuss ways of thinking about use of the CAS to enhance students' symbolic reasoning.

Sun. 8:30 - 9:30 AM **Classroom** Room

“Why I Am Still Fighting to Use a CAS in Mathematics”

Marshall Lassak, *Eastern Illinois University, Charleston, IL*

This presentation will offer several new views on how to involve technology, in particular CAS, in the classroom. These views are helpful in various ways, such as for planning its proper use, for getting more educators excited in using technology, and for making teacher training more efficient.

Sun. 8:30 - 9:30 AM **Issues** Room

“First Uses for CAS”

Kaye Stacey, *University of Melbourne, Victoria, Australia*

This session shows some ways in which CAS can enhance the teaching of junior high school mathematics, including linear equations, simultaneous equations, surds and trigonometry. We consider issues such as how to incorporate CAS use and by-hand skills; encouraging judicious use; better understanding of functions; and solving multi-step problems changes.

Sun. 8:30 - 9:30 AM **Classroom** Room

“Using CAS to Introduce and Explore Complex Numbers”

Diane Whitfield, *Casio MRD Center, Portland Community College, Portland, Oregon*

Learn a different way to introduce complex numbers and how to explore the product of two complex numbers in polar form using CAS and Geometry. Everyone is welcome; basic skills needed to use the ClassPad 300 will be provided throughout the workshop.

USACAS 2007 Program Abstracts (Tentative)

Sun. 9:45 - 10:45 AM **Classroom/Technology** Room

“The Perfect Math Tool?”

Michel Beaudin, *Ecole de Technologie Superieure, Montreal, Quebec, Canada*

One reason behind the new Nspire calculator is the fact that, for years, teachers have been asking for unification in technology. But, there is a price to pay for "unification" and, as far as mathematics teaching is concerned, there is a long way to go in order to succeed.

Sun. 9:45 - 10:45 AM **Research** Room

Al Cuoco, *Educational Development Center, Newton, MA*

Abstract TBA.

Sun. 9:45 - 10:45 AM **Research** Room

“Using CAS in the CorePlus Mathematics Project”

James Fey, *University of Maryland, College Park, MD*

Despite deep reluctance by many teachers to have CAS-dependent materials, we have begun making a number of efforts to offer opportunities for CAS use in the curriculum materials of our project. We'll describe the style, rationale, and informal feedback on results of those efforts.

Sun. 9:45 - 10:45 AM **Issues** Room

“New Views of Teaching and Learning with CAS”

Bernhard Kutzler, *ACDCA, Linz, Austria*

Using powerful technology such as computer algebra systems for teaching and learning mathematics and related subjects means an enormous enrichment which, for many educators, in particular novices and technophobics, at first glance appears complicated, sometimes even threatening. This session will present new ways to teach and learn with CAS.

Sun. 9:45 - 10:45 AM **Classroom** Room

“Interactive Lessons on the Casio Classpad”

George Marino, *Aurora Central Catholic High School (retired), Aurora, IL*

This session will demonstrate lessons in which there is interaction between the student and the calculator. One such activity will be presented as a puzzle in which the student is given a preimage and a target image and experiments

USACAS 2007 Program Abstracts (Tentative)

with different possible compositions of transformations. The transformations are accomplished on the calculator. If the final result is undesirable, the student simply resets the problem and tries again, learning from mistakes. The student is asked to make generalizations and the final results are submitted on the calculator (or files uploaded from the calculator.)

Sun. 9:45 - 10:45 AM

Classroom

Room

“CAS, Counting, and Probability”

Steve Phelps, *Madeira High School, Cincinnati, OH*

Participants will explore probability and counting through hands-on games, and take advantage of the Computer Algebra System on the Voyage 200 or TI-89 to model these games using polynomial multiplication.

Sun. 11:00 - 12:00

Curriculum Panel

Room

“U.S. CAS-Active Curriculum Panel”

Al Cuoco, *Educational Development Center, Newton, MA*

James Fey, *University of Maryland, College Park, MD*

M. Kathleen Heid, *The Pennsylvania State University, University Park, PA*

Zalman Usiskin, *University of Chicago, Chicago, IL*

Natalie Jakucyn (Moderator), *Glenbrook South High School, Glenview, IL*

The panelists, all of whom are U.S. CAS-active curriculum developers, will each provide brief summaries of such issues as a brief history of their curriculum project, how CAS is used, some sample CAS lessons and problems, the challenges of writing and developing a CAS-active curriculum, and some lessons learned from their efforts. There will be an opportunity for questions from the audience.