

Saturday, June 26, 2010

Sat. 7:30 – 8:30 AM

REGISTRATION

CONTINENTAL BREAKFAST & EXHIBITORS

Room: Student Commons C100

Sat. 8:30 – 9:00 AM

Welcome and Orientation

Room: C234

Sat. 9:00 – 10:15 AM

Keynote Session

Room: C234

“Taking Advantage of the Surprise Factor of CAS Responses to Spur the Growth of Algebraic Understanding”

Carolyn Kieran, University of Quebec at Montreal, Canada

Our research has shown the power of surprise responses by CAS technology in the co-emergence of students’ algebraic concepts and techniques. But how best to take advantage of this particular power of the CAS? A scenario that, according to our research results, has been found to be fruitful is one that includes certain components, which are followed in a specific order: first, student work on task-sequences that involve some pattern-seeking related to technical activity, including paper-and-pencil techniques; second, the posing in the task-sequence of a particular question that is considered to lead, for many students, to garden-path errors in their usual paper-and-pencil work; third, having students then use the CAS to produce a response to the same particular question – a response that will, if all goes as intended, be surprising to the student; fourth, reflective activity on the part of the students as to the reason for the discrepancy between the paper-and-pencil and CAS responses, followed by their attempts to reconcile this discrepancy; and last, but by no means least, plenary classroom talk aimed at discussing the discrepancy and the mathematical underpinnings of a correct resolution to the question. During this last phase, the teacher’s mathematical input is critical. My presentation will provide examples of a few such task-sequences, followed by some samples of student work and talk, as well as teacher input, so as to highlight the importance of and role played by the various components.

Sat. 10:30 – 11:30 AM

Room: C231

“M³: The Bavarian CAS Project”

Frank Fritsche, Rupprecht Gymnasium Munich/University of Wuerzburg, Germany

In 2003 the Ministry of Education launched a long-term project on the use of CAS in teaching math. This project has seen real individual integration of CAS by the teachers involved. In one year, the first students will use CAS calculators in the math exit exam. This lecture will show findings of the project concerning the students and their usage of the new tool, the teachers and their influence, and also the role of administration.

Sat. 10:30 – 11:30 AM

Workshop

Room: C225

“The Role of CAS in Learning Mathematics”

Gail Burrill, Michigan State University, East Lansing, MI

How can CAS help us teach reasoning and making sense of mathematics and why should we use it? We will solve some problems using CAS as a tool to understand the mathematics and discuss the affordances and issues involved in using CAS in the process. TI-Nspire CAS calculators will be provided.

Sat. 10:30 – 11:30 AM

Room: C203

“CAS Technology: The Good, the Bad, and the Ugly”

James E. Schultz, *Ohio University (retired), Sheboygan, WI*

Technology can be good for computation, problem solving, and concept building. But it can also be bad when it is used inappropriately and even ugly when it produces wrong results. Examples will be provided for each of these, with a focus on CAS.

Sat. 10:30 – 11:30 AM

Workshop

Room: C221

“From Products and Patterns to Process: Transforming Symbolic Algebra Uses with Interactive Environments”

Thomas Dick, *Oregon State University, Corvallis, OR*

Pedagogical uses of symbolic algebra capabilities have tended to focus on the generation of results (products), which may in turn be studied for patterns. Interactive environments that forge a dynamic link between input-output processes (action-consequence links) can provide insights into the "why" behind those processes. TI-Nspire CAS calculators will be provided.

Sat. 10:30 – 11:30 AM

Workshop

Room: C236

“Introduction to the Casio Classpad 330 and CAS”

Ismael Zamora, *Hinsdale South High School, New Lenox, IL*

Come see the stylus driven CAS calculator. See the new functionality and the most popular calculator in Europe and Asia. Calculators will be provided.

Sat. 10:30 – 11:30 AM

Workshop

Room: C233

“An Introduction to CAS on the TI-Nspire CAS Handheld Calculator”

Ray Klein, *T³ - Teachers Teaching with Technology/Northern IL University, Glen Ellyn, IL*

This session will be an introduction to the CAS features of the TI-Nspire CAS handheld calculator. It will not only feature the "how to" of using the calculator but also many "how to teach with it" activities. Calculators will be provided.

Sat. 11:30 AM – 12:30 PM

LUNCH

Room: Student Commons

Sat. 12:30 – 1:30 PM

Room: C231

“CAS in the UCSMP 3rd Edition Curriculum”

Isaac Greenspan, *The University of Chicago School Mathematics Project (former editor), IL*

See some examples of a Computer Algebra System (CAS) in and arising from the third editions of the University of Chicago School Mathematics Project curriculum's *Advanced Algebra*, *Functions, Statistics, and Trigonometry*, and *Precalculus and Discrete Mathematics*.

Sat. 12:30 – 1:30 PM

Room: C225

“Mathematicians Use of CAS in University-Level Mathematics Teaching”

Zsolt Lavicza, *University of Cambridge, United Kingdom*

During the past decade, there was an increase in CAS use in university-level mathematics education. In my talk, I will outline results of a two-phase international comparative study that examined 1) the extent of CAS use; 2) the factors influencing CAS integration; and 3) the effects of different teaching traditions on university-level CAS-assisted mathematics teaching.

Sat. 12:30 – 1:30 PM

Workshop

Room: C223

“What Might a School CAS Look Like?”

Steve Arnold, *Compass Learning Technologies, Kiama, NSW, Australia*

What CAS functionality do we need for high school mathematics? How much of this functionality may be achieved on the TI-Nspire NON-CAS platform? The answer might well be surprising. In this session we look at freely available symbolic capabilities that may be used on the TI-Nspire and discuss what else might be needed. Calculators will be provided.

Sat. 12:30 – 1:30 PM

Workshop

Room: C236

“Incorporating TI-Nspire CAS and SMART Boards Into the High School Mathematics Classroom”

Tom Reardon, *Fitch High School/Youngstown State University, Poland, Ohio*

Obtain several ideas as to how to use CAS at different levels of high school mathematics by using TI-Nspire documents. Calculators will be provided.

Sat. 12:30 – 1:30 PM

Room: C233

“CAS’-ing the Volume of a Vase: Creating a Conceptual Framework for Calculus”

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

Participants will explore part of a 10th-grade geometry unit involving calculating volumes and surface areas of solids of revolution. TI-Nspire CAS and *GeoGebra* are used side-by-side in a culminating activity of calculating the volume of a curvy vase, comparing the results to real measurements, and discussing possible sources of error.

Sat. 12:30 – 1:30 PM

Workshop

Room: C331

“Introduction to Teaching with TI-Nspire CAS”

Bernhard Kutzler, *ACDCA (Austrian Center for Didactics of Computer Algebra), Linz, Austria*

TI-Nspire CAS is a powerful mathematics teaching and learning tool from Texas Instruments. It comprises a computer algebra system, a dynamic geometry system, a spreadsheet, a graphing package, a statistic package, and a data collection package within an integrated environment. In this beginner’s workshop you will learn step by step to use TI-Nspire CAS computer software in the classroom.

Sat. 1:45 - 2:45 PM

Room: C221

“The Role of CAS in Mathematical Skills and Problem Solving: What Research Suggests and What Research is Still Needed”

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

This presentation will focus on what research suggests and what it does not say about how use of computer algebra systems can affect students, abilities with mathematical skills, and problem solving.

Sat. 1:45 - 2:45 PM

Room: C231

“Implementing CAS at the Whole-School Level: Why and How Three Public Schools Did It”

Phil Gartner, *Glenbrook South High School, Glenview, IL*
Paul Karafiol, *Walter Payton College Prep High School, Chicago, IL*
Steve Viktora, *New Trier Township High School, Winnetka, IL*

Walter Payton College Prep, New Trier, and Glenbrook South are three Chicago-area high schools who have adopted the TI-Nspire CAS calculator for all math classes. Join a discussion with us about why we made the switch, what benefits we expected and have seen, and what challenges we met and how we handled them.

Sat. 1:45 - 2:45 PM

Room: C225

“Is There a Better Way to Teach Algebra? (Part 2)”

Ray Williams, *St Mark's Anglican Community School, Perth, Western Australia*

Following some action research in 2007 that identified some real concerns in student misconceptions in their understanding of what the CAS engine does and how it interprets input, an approach to the introduction of algebraic concepts was developed. This is its story.

Sat. 1:45 - 2:45 PM

Workshop

Room: C203

“Using CAS to ‘Discover’ Formulas: Employing Pattern Recognition to Increase Retention”

Nathan Austin, *CASIO Education Technology MRD, Portland, OR*

Change the discussion from *what* students need to learn to *why* and *how* it work. Working through numbers is important, but we will look at methods of emphasizing algebraic patterns underlying formulas using CAS as a helpful tool. We will be providing the CASIO ClassPad – no previous experience is required.

Sat. 1:45 - 2:45 PM

Workshop

Room: C224

“Exploring CAS Features in Algebra 2 and Precalculus”

Jon Lepeska, *New Trier Township High School, Winnetka, IL*

Learn how we use CAS to enhance our instruction in our Algebra 2 and Precalculus classrooms. Topics will include solving of radical/rational equations, properties of exponents and logs, and solving trigonometry application problems. Participants will step through several examples using a "hands on" approach. TI-Nspire CAS calculators will be provided.

Sat. 1:45 - 2:45 PM

Room: C233

“Pushing the Envelope’ with CAS”

Lin McMullin, *National Math & Science Initiative, Richardson, TX*

Considering the capabilities of computer algebra systems, what changes could (and should) be made to the content taught in secondary mathematics classrooms? What mathematics becomes less important? More important? This session is designed for participants who are more experienced users of CAS to react to some suggestions and to brainstorm other ideas.

Sat. 2:45 – 3:00 PM

SNACK

Room: Student Commons

Sat. 3:00 - 4:00 PM

Room: C224

“The Ethics of Using CAS”

Zalman Usiskin, *The University of Chicago (professor emeritus), IL*

The use of CAS raises ethical questions. Is it ethical for some students to have CAS while others don't? Is it ethical to teach students to use CAS on tasks they should be able to do in their heads or easily with paper and pencil? Is it ethical for a student to use CAS without telling the teacher? These and similar questions will be discussed.

Sat. 3:00 - 4:00 PM

Room: C231

“Technology and the Yin & Yang of Teaching and Learning Mathematics”

Bernhard Kutzler, *ACDCA (Austrian Center for Didactics of Computer Algebra), Linz, Austria*

We will develop a model comprising six teaching and learning archetypes (compensate, explore, solve, represent, communicate, & document) and use this model to look at the various roles that technology, in particular computer algebra systems, can play for each.

Sat. 3:00 - 4:00 PM

Workshop

Room: C236

“Create Your Own Interactive Algebra Documents Using TI-Nspire”

Steve Arnold, *Compass Learning Technologies, Kiama, NSW, Australia*

This is a hands-on workshop for participants to learn how to create their own interactive learning documents using TI-Nspire. From basic algebra through calculus, you will be surprised how easy it is to engage your students and provide feedback. No prior experience is needed. Calculators will be provided.

Sat. 3:00 - 4:00 PM

Workshop

Room: C223

“CAS, Problem Solving, and Plausibility in Algebra 2”

Douglas O’Roark, *The University of Chicago, IL*

How does using CAS in Algebra 2 impact content, assessment, and pedagogy? We'll engage in activities that illustrate how our thinking about Advanced Algebra changes when students have access to the TI-Nspire CAS. Calculators will be provided.

Sat. 3:00 - 4:00 PM

Room: C233

“ Enhancing Precalculus Mathematics with CAS”

Ben Klein, *Davidson College, Cincinnati, Ohio*

Using a series of problems, we will show how CAS can be used to enhance the teaching of some difficult precalculus topics, including inverse functions and inequalities. We will attempt to demonstrate how removing algebraic and numeric drudgery from a topic can promote understanding. Classpad 330 calculators will be provided.

Sat. 3:00 - 4:00 PM

Workshop

Room: C331

“GeoGebra CAS Workshop”

Zsolt Lavicza, *University of Cambridge, United Kingdom*

GeoGebra is an open-source mathematical software joining geometry, algebra, calculus, and statistics into an easy-to-use computer package. The new version of *GeoGebra* includes a full-featured symbolic calculator: *GeoGebraCAS*. In this workshop, I will show new features of *GeoGebraCAS* and how it could be used for teaching mathematical topics.

Sat. 4:00 – 4:15 PM

BOARD BUSSES FOR HOTEL

South End of C Building

Sunday, June 27, 2010

Sun. 7:30 – 8:30 AM	CONTINENTAL BREAKFAST	Room: Student Commons
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Sun. 8:30 - 9:30 AM

Room: C231

“Cultural Influences on CAS Use in Mathematics Teaching”

Laszlo Erdodi, *Eastern Michigan University, Ann Arbor, MI*
Zsolt Lavicza, *University of Cambridge, United Kingdom*

Research suggests that teachers beliefs and their cultural background have a substantial influence on their use of technology in teaching. In this talk, we will outline the models of cultural influences on CAS use based on a large-scale study conducted in Canada, Hungary, the United Kingdom, and the United States.

Sun. 8:30 - 9:30 AM

Room: C225

“Mathematics Questions in Standardized Tests That Permit CAS”

Elida Wylie, *Educational Testing Service, Princeton, NJ*

Mathematics staff at ETS are concerned that the tests we develop that permit calculators do not unfairly advantage students due to the type of technology they utilize. Simultaneously, we are concerned that our tests continue to focus on areas of the discipline that remain pertinent. The purpose of our research is to obtain more information about how to effectively, consistently, and efficiently do this.

Sun. 8:30 - 9:30 AM

Workshop

Room: C221

“Student Developed Interactive Worksheets as an Aid in Developing Problem Solving Skills”

Allan Bellman, *University of California, Davis, CA*

We will discuss students developing interactive worksheets and then playing what if, as an aid in their development of problem solving skills. The Interactive Notes App from TI-Nspire CAS will be used. You will develop a few worksheets to see how this works. Results with students will be discussed. Calculators will be provided.

Sun. 8:30 - 9:30 AM

Workshop

Room: C233

“Being Creative with CAS in Algebra 1”

Mary Wiltjer, *Glenbrook South High School, Glenview, IL*

CAS is a powerful pedagogical tool. This workshop will share some creative (and some not so creative) ways to incorporate CAS into Algebra to improve student understanding. TI-Nspire CAS calculators will be provided.

Sun. 8:30 - 9:30 AM

Workshop

Room: C236

“Teaching Second Year Algebra with CAS”

Michael Buescher, *Hathaway Brown School, Cleveland, OH*

Bringing CAS into Algebra 2 classrooms raises a host of questions around pedagogy, content, and evaluation. Come share classroom activities, teaching techniques, and assessment ideas filtered and refined through ten years of teaching Advanced Algebra using CAS. TI-Nspire CAS calculators will be provided.

Sun. 8:30 - 9:30 AM

Room: C203

“The Evolution of CAS”

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

Today, CAS does much more than symbol manipulation. Many CAS have the capability to graph, manipulate data, animate, and provide the ability to create dynamic user interfaces. This session shares how CAS is evolving, and how we as teachers can evolve with it. Algebraic reasoning, mathematics investigation, and geometric visualization examples will be shared.

Sun. 9:45 - 10:45 AM

Room: C224

“Using CAS on the Job: The Mathematics of Task Design”

Al Cuoco, *Center for Mathematics Education-EDC, Newton, MA*

Computer algebra is a tool that teachers can use as they create problem sets and plan lessons. For example, how can you find integer sided triangles whose vertices on the coordinate plane have integer coordinates? Polynomial functions with integer coefficients, integer zeros, and extrema with integer coefficients? CAS can help.

Sun. 9:45 - 10:45 AM

Room: C231

“Crop Circles: The Mathematics of Central Pivot Irrigation”

Philip Todd, *Saltire Software, Beaverton, OR*

Fly over Lubbock, Texas and you will see a mosaic of circular fields created by central pivot irrigation. We investigate some mathematical problems addressed by farmers who want to optimize land usage in the face of existing terrain features. We use Google Earth, *Geometry Expressions* and TI-Nspire CAS.

Sun. 9:45 - 10:45 AM

Workshop

Room: C233

“Incorporating TI-Nspire CAS in an Inclusion Classroom to Help Struggling Students Succeed in Algebra”

Anna Panova, *Lawrence High School, Hamilton, NJ*

The TI-Nspire CAS handheld can be used to help struggling students understand the process without getting stuck with the calculations when learning a new topic. This workshop will focus on the process of incorporating TI-Nspire CAS in two inclusion classes: Algebra 1 and 2. Calculators will be provided.

Sun. 9:45 - 10:45 AM

Workshop

Room: C203

“The Mathematics of Recursively-Imbedded Expressions”

Mike Reiners, *Christ's Household of Faith School, Saint Paul, MN*

Participants will use CAS and Natural Display technology to investigate nested fractions, nested radicals, and other recursively-imbedded expressions. Discussion will surround the use of related problems in classroom and competition and the relative appropriateness of CAS availability. Casio Classpad 330 CAS calculators will be provided.

Sun. 9:45 - 10:45 AM

Workshop

Room: C223

“Working Through a Single ‘Nspired’ Mathematics Problem”

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

Participants will have the opportunity to (slowly) work through one GOOD secondary school mathematics problem using the TI-Nspire CAS calculator to get the feel for how the calculator might be used to explore similar (or not so similar) problems. Time will be left at the end for a frank discussion concerning the use of CAS in the mathematics classroom. Calculators will be provided.

Sun. 9:45 - 10:45 AM

Room: C234

“Open Forum Discussion of CAS”

Natalie Jakucyn, *Glenbrook South High School, Glenview, IL*

Do you have questions and concerns about using CAS in the classroom, on standardized tests, in college? Questions that were not answered at USACAS6 up to now? Or just want to vent or hear what some of the issues are with CAS? This session is designed to be a loosely structured Q & A format with topics/issues suggested by the participants and moderated by a experienced user of CAS in the teaching of secondary mathematics.

Sun. 11:00 AM - 12:00 PM

Workshop

Room: C225

“CAS at Work: Connecting Roads”

Frank Fritsche, *Rupprecht Gymnasium Munich/University of Wuerzburg, Germany*

Simple problems can cause students to show a variety of solutions and solution strategies. We will consider surprising ways of looking at a problem and at the tool used to solve it! This session will be a "hands-on" workshop of examples that were given to a grade 11 class. Some class findings will also be shared. TI-Nspire CAS calculators will be provided.

Sun. 11:00 AM - 12:00 PM

Room: C236

“Uses of CAS That Support or Hinder Problem Solving and Mathematical Skill Development”

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

We dig into what research might tell us about uses of CAS that support the development of problem solving and skill development, and uses that might derail student learning in these areas. Favorite problems will be used to illustrate how task, teacher, and tool form a winning combination for students.

Sun. 11:00 AM - 12:00 PM

Room: C224

“Integrating CAS into High School Mathematics”

Al Cuoco, *Center for Mathematics Education-EDC, Newton, MA*

We will look at how CAS technology is used in The CME Project, an NSF-supported four year high school curriculum. Topics will include fitting polynomial functions to tables of data, finding the monthly payment on a loan, calculating regression lines, finding tangents to graphs of functions, and modeling algebraic structures.

Sun. 11:00 AM - 12:00 PM

Workshop

Room: C203

“Love and Peace in the Mathematics Classroom?”

Diane Whitfield, *Portland Community College/Casio MRD Center, Portland, OR*

In this workshop, experience how I used CAS to teach rational and radical expressions before stepping back to basic algebra. For basic algebra, we will use a free application that depends on CAS called Love&Piece. One ClassPad 330 will be given away during the workshop. Casio Classpad 330 calculators will be provided.

Sun. 11:00 AM - 12:00 PM

Room: C221

**“Using Computer Algebra in a 4th-year High School Mathematics Course
for the Average Student”**

Gregory Foley, *Ohio University, Athens, OH*

Computer algebra is commonly used in AP calculus, but other high school students in the USA typically have no opportunity to experience a CAS environment. The talk will describe a CAS-based post-Algebra II course in numerical reasoning, statistical reasoning, discrete and continuous modeling, and geometric modeling and spatial reasoning.

Sun. 11:00 AM - 12:00 PM

Workshop

Room: C331

“Connecting Geometry and Algebra with CAS-based Applets”

Michael Todd Edwards, *Miami University, Oxford, OH*

In this interactive computer session, we highlight the use of *GeoGebra*, a freeware dynamic mathematics software, and TI-Nspire CAS software to create interactive applets. Participants will gain hands-on practice creating personalized applets for their students.

Sun. 12:15 - 1:00 PM

LUNCH

Room: Student Commons

Sun. 12:30-1:00 PM

BOARD BUSSES FOR HOTEL

South End of C Building