



## THE ELEVENTH CONFERENCE ON RESEARCH IN UNDERGRADUATE MATHEMATICS EDUCATION – SAN DIEGO, CA., FEBRUARY 28 – MARCH 2, 2008

As part of its on-going activities to foster research in undergraduate mathematics education and the dissemination of such research, the Special Interest Group of the Mathematical Association of America on Research in Undergraduate Mathematics Education (SIGMAA on RUME) presents its eleventh Conference on Research in Undergraduate Mathematics Education.

This conference is a forum for researchers in collegiate mathematics education and includes the following themes: Results of current research, contemporary theoretical perspectives and research paradigms, and general issues in the psychology of mathematics education as it pertains to the study of undergraduate mathematics. The program will include plenary addresses, contributed paper sessions, and preliminary paper sessions.

Plenary Speakers for the conference will be:

- *Judith Grabiner*
- *David Hammer*
- *John Mason*
- *Anna Sierpiska*

There will also be a special panel discussion on Doctoral programs in Mathematics Education in the United State. Panelist include *Shandy Hauk*, *Karen King*, *Karen Marrongelle*, and *Keith Weber*.

Sessions will begin at 7:00 pm on Thursday, February 28, 2008, and continue through to noon on Sunday, March 2, 2008. The opening plenary will take place on Thursday evening followed by a reception. **The deadline for proposals is November 5, 2007.** More information on the conference is available at <http://cresmet.asu.edu/crume2008/>

## WINNER OF BEST PAPER AWARD AT THE 2007 TENTH CONFERENCE ON RESEARCH IN UNDERGRADUATE MATHEMATICS EDUCATION

Congratulations to *David Kung* and *Natasha Speer*, whose paper was selected as the winner of the Best Paper presented at the 10<sup>th</sup> annual conference on research in undergraduate mathematics education. Their paper, *Teaching Assistants Learning to Teach: Recasting Early Teaching Experiences as Rich Learning Opportunities*, presents an analysis of how the research literature on teachers' on the job learning can be applied to the context of graduate student professional development. Congratulations to David and Natasha! Their winning paper is available at the RUME conference proceedings link at [www.rume.org](http://www.rume.org).

## RESEARCH IN COLLEGIATE MATHEMATICS EDUCATION – PUBLISH YOUR WORK

Considered one of the top publications for RUME, the Research in Collegiate Mathematics Education (RCME) volumes are overseen by SIGMAA on RUME and jointly published by The American Mathematical Society and the Mathematical Association of America. Current editors are *Derek Holton* and *Patrick Thompson*. Our gratitude goes to *Fernando Hit*, who recently completed an extended term as co-Editor with Pat and Derek. Articles in RCME are peer-reviewed for two major features: (1) advancing our understanding of collegiate mathematics education, and (2) readability by a wide audience of practicing mathematicians interested in issues affecting their own students. For information on how to submit a paper for consideration in RCME, see <http://www.rume.org/rcme/index.html>. Special thanks to Shandy Hauk for all her hard work in putting this great website together!

RCME VI is available from the AMS Bookstore at [www.ams.org/bookstore](http://www.ams.org/bookstore) for an individual price of \$39.

## THE ANNIE AND JOHN SELDEN AWARD

Nominations are now being solicited for the MAA Annie and John Selden Award for Research in Undergraduate Mathematics Education. The Selden Award is given in even years and honors a researcher who has established a significant record of published research in undergraduate mathematics education and who has been in the field at most ten years. All nominations must be in by October 31, 2007. See <http://www.maa.org/Awards/selden.html> for further information and nomination forms.

## SIG-RME AWARD

Congratulations to *Keith Weber*, who was selected as the recipient of the 2006 American Educational Research Association's Special Interest Group for Research in Mathematics Education (SIG-RME) Early Career Publication Award. Keith received the award for the paper, co-authored with Lara Alcock, entitled "Semantic and syntactic proof productions". The paper was published in *Educational Studies in Mathematics*. It is great to see members of RUME being recognized by the broader K-12 mathematics education community. Congratulations Keith!

## NEW RESEARCH TO PRACTICE SESSION AT MATHFEST A SUCCESS!

This year marked a new type of SIGMAA on RUME sponsored session at MathFest. *Marilyn Carlson* led two, 90-minute interactive sessions that were attended by over 40 participants. The sessions, *Essential Reasoning Abilities and Conceptual Foundations for Beginning Calculus*, were designed to make strong connections between research and practice. For example, during the first session participants discussed video of student reasoning on tasks from the *Precalculus Assessment Instrument*. This instrument assesses student understanding of the function concept and related reasoning abilities that mathematics education research studies have revealed to be foundational for understanding concepts in first semester calculus.

After the first session participants read two mathematics education research papers and had follow up discussions the next day. They also had the opportunity to discuss modules developed in a current research project to promote students' understandings of the concept of function. Participants examined video data of students as they completed tasks in these modules. Discussions also led to reflections about the function knowledge needed for understanding ideas of limit, derivative and accumulation. Curricular activities that have been successful in promoting function understandings in students and select items from the PCA instrument were shared with workshop participants. Thanks to *Marilyn Carlson* for making this new session format a success! SIGMAA on RUME looks forward to sponsoring similar sessions at future MathFests.

## SIGMAA OFFICER ELECTIONS

This year marks a change in the process for managing elections for SIGMAA on RUME officers. Elections for officers will now be web-based and managed through the MAA office. Paper ballots will be provided on request only. The SIGMAA on RUME ballot will take place late October, 2007. More information on the upcoming ballot will be available at [www.rume.org](http://www.rume.org) and distributed through the SIGMAA on RUME listserv.

## SIGMAA ON RUME SPONSORED EVENTS AT THE JOINT MATHEMATICS MEETINGS, 2008, SAN DIEGO, CA

- 1) Special Panel Session
  - 2) Two Contributed Paper Sessions
  - 3) Business Meeting
- 1) *Making the Connection Between Research and Teaching in Undergraduate Mathematics Education (Sunday, January 6, 9:00 am – 10:20 am)*

This session of invited speakers will discuss several chapters from a forthcoming MAA Notes volume on research in undergraduate mathematics education, edited by *Marilyn Carlson* and *Chris Rasmussen*. Chapters from the forthcoming book include papers

written by mathematics education researchers and by mathematicians discussing topics in the undergraduate curriculum as well as overarching issues in undergraduate mathematics education, with emphasis on the implications of that research in the teaching of undergraduate mathematics. The panel session will feature the following three presentations: *Guershon Harel and Stacy Brown*, Mathematical Induction: Cognitive and Instructional Considerations; *Annie and John Selden*, Overcoming Students' Difficulties in Learning to Understand and Construct Proofs; and *Keith Weber and Sean Larsen*, Teaching and Learning Group Theory.

2.1) *Research on the Teaching and Learning of Undergraduate Mathematics (Part I: Monday, January 7, 1:00 pm - 3:00 pm. Part II: Wednesday, January 9, 1:00 pm - 6:00 pm)*

Parts I and II of this contributed paper session include research presentations that address issues concerning the teaching and learning of undergraduate mathematics. The first session, Part I, will begin with an invited talk by *Michelle Zandieh*, Mathematical Reasoning: Insights from Cognitive Psychology. This will be followed by four shorter presentations. Part II will begin with two invited presentations, the first by *Natasha Speer* and *David Kung*, Mathematics Teaching Assistants Learning to Teach: Recasting Early Teaching Experiences as Rich Learning Opportunities. The second invited presentation will be given by *Joe Wagner*, Beyond the Mathematics: What Else is Needed to Teach in an Inquiry-Oriented Classroom? These two invited talks will be followed by ten shorter paper presentations.

2.2) *Guided Discovery in Mathematics Education (Tuesday, January 8, 1:00 - 6:15 pm)*

This contributed paper session presents research related to the teaching of mathematics. There is growing research evidence in many fields, particularly mathematics and physics, that non-lecture based approaches to teaching are more

effective in providing conceptual understanding of the subject. Physics has extensive published research on the efficacy of such programs. Mathematics education has been much slower to embrace this movement, rightly or wrongly. The session will begin with the following three invited paper presentations: *John Clement*, Applying Physics Education Research to Math Education; *Chris Hirsch*, Using Contextual Problems to Support Student Discovery in Pre-Calculus Mathematics: Exemplars and Efficacy; *Jerome Epstein*, An Integrated Math and Physical Science Laboratory Program for Cognitive Development. These invited presentations will be followed by nine shorter paper presentations.

(3) *Business Meeting (Tuesday, January 8, 6:30pm - 7:30 pm)*

#### USING STATISTICS EFFECTIVELY IN MATHEMATICS EDUCATION RESEARCH

[http://www.amstat.org/research\\_grants/pdfs/SMERReport.pdf](http://www.amstat.org/research_grants/pdfs/SMERReport.pdf)

Sound reform of education policy and practice must be based on sound research, and school mathematics would continue to benefit greatly from both such reform and such research. That is the spirit that led to a series of workshops to investigate how mathematics education researchers and statisticians could strengthen scientifically based research in mathematics education by sharing ideas from their respective disciplines.

Funded by the National Science Foundation, workshops were held over a three-year period, each with about twenty participants nearly equally divided between mathematics educators and statisticians. In these exchanges the mathematics educators presented honest assessments of the status of mathematics education research (both its strengths and its weaknesses), and the statisticians provided insights into modern statistical methods that could be more widely used in such research. The discussions led to an outline of guidelines for evaluating and reporting mathematics

education research, which were molded into the current report. The purpose of the reporting guidelines is to foster the development of a stronger foundation of research in mathematics education, one that will be scientific, cumulative, interconnected, and intertwined with teaching practice.

The guidelines are built around a model involving five key components of a high-quality research program: generating ideas, framing those ideas in a research setting, examining the research questions in small studies, generalizing the results in larger and more refined studies, and extending the results over time and location. Any single research project may have only one or two of these components, but such projects should link to others so that a viable research program that will be interconnected and cumulative can be identified and used to effect improvements in both teaching practice and future research. The guidelines provide details that are essential for these linkages to occur. Three appendices provide background material dealing with (a) a model for research in mathematics education in light of a medical model for clinical trials; (b) technical issues of measurement, unit of randomization, experiments vs. observations, and gain scores as they relate to scientifically based research; and (c) critical areas for cooperation between statistics and mathematics education research, including qualitative vs. quantitative research, educating graduate students and keeping mathematics education faculty current in education research, statistics practices and methodologies, and building partnerships and collaboratives.

#### **RECHARGED LITERATURE COMMITTEE**

The literature committee has been renewed and recharged to update and improve the literature database available at the SIGMAA on RUME website ([www.rume.org](http://www.rume.org)). Keith

Weber is chairing the committee, with fellow committee members Kelly Finn, Teri Jo Murphy, Debasree Raychaudhuri, Gloria Robalo, Mary Shepherd, Monica Harrison Smith, and Aaron Weinberg. Thank you to all these committee members for volunteering their time and energy to improve and update the literature database. This is a hugely important resource for the entire RUME community.

#### **IMPORTANT REMINDER**

Most SIGMAA on RUME communications are electronic. All important SIGMAA on RUME announcements appear on the RUME listserv. In order to receive these announcement sign up by following the e-mail discussion list link at [www.rume.org](http://www.rume.org).

#### **SIGMAA ON RUME EXECUTIVE COMMITTEE**

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