

**15th ANNUAL CONFERENCE ON
RESEARCH ON UNDERGRADUATE MATHEMATICS EDUCATION
THURSDAY, FEBRUARY 24, 2011 – SUNDAY, FEBRUARY 27, 2011
CONFERENCE SCHEDULE**

THURSDAY, FEBRUARY 23, 2012

THURSDAY, 8:00 AM – 12:00 PM
RUME Working Group Meetings
LOCATION TBA

THURSDAY, 12:00 – 1:00PM
Registration
LOCATION TBA

**Session 1 – CONTRIBUTED REPORTS
THURSDAY, 1:00 – 1:30 PM**

LOCATION	SPEAKER	TITLE
	#17 Jungeun Park	Discursive Approach to Calculus Students' Thinking About the Derivative
	#94 Megan Wawro	Expanding Toulmin's Model: The Development of Four Expanded Argumentation Schemes from Analysis in Linear Algebra
	#76 Marina Kogan and Sandra Laursen	Role of Faculty Professional Development in Improving Undergraduate Mathematics Education: The Case of IBL Workshops

**Session 2 – PRELIMINARY REPORTS
THURSDAY, 1:40 – 2:10 PM**

LOCATION	SPEAKER	TITLE
	#26 Vlima Mesa, Elaine Lande, & Tim Whittmore	Using Community College Students' Understanding of a Trigonometric Statement to Study Their Instructors' Practical Rationality in Teaching
	#102 Aaron Wangberg	Raising Calculus Students' Calculus Understandings to the Surface in Multivariable Calculus
	#92	A Guided Reinvention of the

	John Paul Cook	Definitions of Ring, Integral Domain, and Field
	#83 Ricardo Nemirovsky, Brooke Ernest, & Molly Kelton	Learning to Play Projective Geometry: An Embodied Approach to Undergraduate Geometry Learning
	#73 Sharon Strickland & Betsygail Rand	Improving Undergraduate Novice Proof-Writing: Investigating the Use of Multiple Drafts
	#101 Debasree Raychaudhuri	A Longitudinal Study of Mathematics Graduate Teaching Assistants' Beliefs about the Nature of Mathematics and their Pedagogical Approaches toward Teaching Mathematics
Session 3 – CONTRIBUTED REPORTS THURSDAY, 2:20 – 2:50 PM		
LOCATION	SPEAKER	TITLE
	#58 Alexandria Theakston	The Search for the Normative Identity in a College Algebra Class
	#68 Stacy Brown	Making Jumps: An Exploration of Students' Difficulties Interpreting Indirect Proofs
	#91 Michael Tallman & Marilyn Carlson	A Characterization of Calculus I Final Exams in U.S. Colleges and Universities
COFFEE BREAK THURSDAY, 2:50 – 3:20 AM		
Session 4 – PRELIMINARY REPORTS THURSDAY, 3:30 – 4:00 PM		
LOCATION	SPEAKER	TITLE
	#61 Jerome Trouba	The Effects of Three Homework Systems on Student Learning in Intermediate Algebra: A Comparative Study
	#104 Brian Lindaman	Instructional Influence on Student Understanding of Infinite Series
	#96 Juan Pablo Mejia-Ramos, Keith Weber, Evan Fuller and Aron Samkoff	Factors influencing students' propensity for semantic and syntactic reasoning in proof writing: A case study
	#41 Natalie Selinski	Examining Students' Mathematical Transition Between Secondary School and University – The Case of Linear Independence and Dependence
	#28	Exploring success of

	Angie Hodge and Christina Weber	underrepresented groups in university mathematics courses
	#32 Melissa Mills	Investigating the Teaching Practices of Professors When Presenting Proofs: The Use of Examples
Session 5 – CONTRIBUTED REPORTS THURSDAY, 4:10 – 4:40 PM		
LOCATION	SPEAKER	TITLE
	#82 Jason Martin, Michael Oehrtman, Craig Swinyard and Beth Cory	Reinvention Six Months Later: The Case of Megan
	#36 Egan Chernoff	Providing answers to a question that was not asked.
	#10 Shiva Gol Tabaghi	Dynamic Geometric Representation of Eigenvectors
Session 6 – PRELIMINARY REPORTS THURSDAY, 4:50 – 5:20 PM		
LOCATION	SPEAKER	TITLE
	#27 Rachael Todd	Opportunities to Develop Understanding of Calculus: A Framework for Analyzing Homework Exercises
	#66 Mary Shepherd	A First Look at How Mathematicians Read Mathematics for Understanding
	#70 Allison Toney, Kelli Slaten and Elisabeth Peters	For Educational Color Work: Diagrams in Geometry Proofs
	#35 Mark Yannotta	Articulating Students' Intellectual Needs: A Case of Axiomatizing
	#78 Cameron Byerley, Neil Hatfield and Pat Thompson	Calculus Student Understandings of Division and Rate
	#84 Krista Toth and Vicki Sealey	Student Understanding of Integration When Applied to Finding Volumes of Solids
BREAK Embassy Suites Complementary Happy Hour THURSDAY, 5:30 – 6:30 PM		
PLENARY TALK THURSDAY, 7:00 – 8:30 PM [LOCATION TBA] <i>The Challenges of Observation</i>		

Alan Schoenfeld
University of California at Berkeley

THURSDAY, 7:30 – 9:00 PM
RECEPTION
[LOCATION TBA]

FRIDAY, FEBRUARY 24, 2011

Breakfast & Registration
7:30 – 8:30 AM
Oregon Ballroom, Salon E

Session 7 – PRELIMINARY REPORTS
FRIDAY, 8:30 – 9:00 AM

LOCATION	SPEAKER	TITLE
	#29 May Hamdan	Genetic decomposition of Integration
	#5 Madeleine Jetter	Assessing Proof Schemes: An Interesting "Proof" By Mathematical Induction
	#85 Vicki Sealey, Jessica Deshler and Krista Toth	First Semester Calculus Students' Understanding of the Intermediate Value Theorem
	#75 Danielle Champney and Eric Kuo	An Evolving Visual Image of Approximation with Taylor Series – A Case Study
	#20 John Mayer and William Bond	Improving Student Success in Developmental Algebra and Its Impact on Subsequent Mathematics Courses
	#22 Brian Fisher and Timothy Lucas	The Role of Technology in Constructing Collaborative Learning Spaces

Session 8 – CONTRIBUTED REPORTS
FRIDAY, 9:10 – 9:40 AM

LOCATION	SPEAKER	TITLE
	#12 Hilda Salgado and María Trigueros	Teaching Eigenvalues and Eigenvectors with a Modeling Approach
	#25 Hortensia Soto-Johnson, Michael Oehrtman, Kristin Noblet, Lee Roberson and Sarah Rozner	Experts' Reification of Complex Variables Concepts: The Role of Metaphor
	#69 Claire Wladis, Michael George and Kathleen Offenholley	Identifying Developmental Students Who are At-Risk: An Intervention Using Computer-Assisted Instruction at a Large Urban Community College

Session 9 – PRELIMINARY REPORTS
FRIDAY, 9:50 – 10:20 AM

LOCATION	SPEAKER	TITLE
	#50 Jessica Ellis, Francesca Henderson, Chris Rasmussen and Michelle Zandieh.	Operational and Structural Reasoning with Linear Transformations
	#74 Estrella Johnson	Mathematical Activity for Teaching
	#99 Aron Samkoff, Keith Weber and Pablo Mejia-Ramos	What's the big idea?: Mathematicians' and undergraduates' proof summaries
	#103 Wendy Aaron, Vilma Mesa and Patricio Herbst	Challenges and Tools in the Facilitation of Combined Professional Development and Research Sessions: The Case of Community College Trigonometry Instructors
	#62 Gillian Galle	What do Students do in Self-formed Mathematics Study Groups?
	#65 Rebecca Dibbs and Michael Oehrtman	Learning trajectories and formative assessment in first semester calculus
COFFEE BREAK FRIDAY, 10:20 – 10:50 AM		
Session 10 – CONTRIBUTED REPORTS FRIDAY, 10:50 – 11:20 AM		
LOCATION	SPEAKER	TITLE
	#90 Kathryn Underwood and Marilyn Carlson	Understanding how precalculus teachers develop mathematic knowledge for teaching the idea of proportionality
	#57 Todd Cadwalladerolsker, Nicole Engelke, Scott Annin & Amanda Henning	Does a Statement of Whether Order Matters in Counting Problems Affect Students' Strategies?
	#42 Claire Wladis, Kay Conway and Alyse Hachey	Are Online Students in STEM Courses at Greater Risk of Non-Success?
Session 11 – PRELIMINARY REPORTS FRIDAY, 11:30 – 12:00 PM		
LOCATION	SPEAKER	TITLE
	#23 Rebecca Dibbs, David Glassmeyer, Michael Oehrtman, Craig Swinyard and Jason Martin	Authority dynamics in mathematics discussions
	#98 Shandy Hauk, Michelle Chamberlin, Billy Jackson, Nissa Yestness, Kristin King and Robert Raish	Interculturally Rich Mathematics Pedagogical Content Knowledge for Teacher Leaders
	#31 Tim Fukawa-Connelly, Aaron Weinberg, Emilie Wiesner, Sarah Berube and Kyle Gray.	Student note taking behavior in proof-based mathematics classes
	#51 Karen Keene and William Hall	A Case of Bridging Communities: Mathematicians and Preservice Elementary

		Teachers
	#33 Lisa Mantini, Melissa Mills and Jesse Johnson	Reading Comprehension of Series Convergence Proofs in Calculus II
	#86 Samuel Pazicni, Karen Marrongelle and Warren Christensen	Tackling Teaching: Understanding Commonalities among Chemistry, Mathematics, and Physics Classroom Practices
LUNCH FRIDAY, 12:00 PM – 1:00 PM LOCATION: TBA		
SPECIAL SESSION FRIDAY, 1:00 – 2:00 PM [LOCATION TBA] <i>Sharing the Teaching Commons: SoTL and RUME</i> Jacqueline Dewar Loyola Marymount University		
Session 12 – CONTRIBUTED REPORTS FRIDAY, 2:10 – 2:40 PM		
LOCATION	SPEAKER	TITLE
	#16 Kevin Moore, Kevin Laforest and Hee Jung Kim	The Unit Circle and Unit Conversions
	#30 Hyung Kim, Tim Fukawa-Connelly and Samuel Cook	Student understanding of statistical symbols
	#72 Osvaldo Soto	Teacher Change in the Context of a Proof-Centered Professional Development
COFFEE BREAK FRIDAY, 2:40 – 3:10 PM		
Session 13 – CONTRIBUTED REPORTS FRIDAY, 3:10 – 3:40 PM		
LOCATION	SPEAKER	TITLE
	#24 Krishna Subedi	Notion of Reducing Abstraction in Teaching: The Case of Mathematics Instruction
	#100 Michelle Zandieh, Jessica Ellis and Chris Rasmussen	Student Concept Images of Function and Linear Transformation
	#88 Keith Weber and Juan Pablo Mejia-Ramos	How and why mathematicians read proofs: A qualitative exploratory study and a quantitative confirmatory study
Session 14 – PRELIMINARY REPORTS		

FRIDAY, 3:50 – 4:20 PM		
LOCATION	SPEAKER	TITLE
	#63 Gillian Galle	Student Troubles with Simple Harmonic Motion Models
	#43 Ian Whitacre, Jessica Pierson Bishop, Mindy Lewis, Lisa Lamb, Randolph Philipp and Bonnie Schappelle	Children’s Reasoning about Integers: Video Clips to Share with Preservice Teachers
	#52 Milos Savic	What do mathematicians do when they reach a proving impasse?
	#46 Mindy Capaldi	A Study of Abstract Algebra Textbooks
	#81 Beth Cory, Jason Martin, Michael Oehrtman and Craig Swinyard.	The Use of Dynamic Visualizations Following Reinvention
	#55 Jennifer Czocher	Mathematical Modeling and Engineering Major
Session 15 - CONTRIBUTED REPORTS FRIDAY, 4:30 – 5:00 PM		
LOCATION	SPEAKER	TITLE
	#6 Eric Weber	Two-Variable Functions: Novice and Expert Shape Thinking
	#4 Michael Mcallister	To Reject or Not to Reject: One Student’s Non-Normative Decision Procedure for Testing a Null Hypothesis
	#1 Jennifer Szydlik and Carol Seaman	Prospective Elementary Teachers' Evolving Meanings for Generalizing, Doing Mathematics and Justifying
PLENARY TALK FRIDAY, 5:15 – 6:15 PM [LOCATION TBA] <i>The engineers in your math classes: What are they thinking?</i> Cynthia Atman University of Washington		
Embassy Suites Complementary Happy Hour FRIDAY, 6:30 – 7:30 PM		
DINNER FRIDAY, 7:30 PM On Your Own		
SATURDAY, FEBRUARY 25, 2011		
Breakfast		

7:30 – 8:30 AM

Session 16 - CONTRIBUTED REPORTS
SATURDAY, 8:30 – 9:00 AM

LOCATION	SPEAKER	TITLE
	#49 Rebecca Schmitz and Harvey Keynes	Student Learning of Key Concepts in Sequences and Series
	#45 Jim Brandt and Gretchen Rimmasch	Small Group Discussion and Student Evaluation of Presented Proofs
	#54 Claire Wladis and Alla Morgulis	Increasing Student Success in Intermediate Algebra through Collaborative Learning at a Diverse Urban Community College

Session 17 – PRELIMINARY REPORTS
SATURDAY, 9:10 – 9:40 AM

LOCATION	SPEAKER	TITLE
	#13 Todd Grundmeier, Alyssa Eubank, Shawn Garrity, Alyssa Hamlin, and Dylan Retsek	Undergraduate Proof in the Context of Inquiry-Based Learning
	#106 Jacqueline Dewar	Future Teachers' Views of Mathematics and Intentions for Gender Equity: Are These Carried Forward into Their Own Classrooms?
	#59 Vilma Mesa and Tim Whittemore	Investigating Instructors' Concerns as They Learn to Teach with Inquiry-Based Learning Methods
	#79 Spencer Bagley, Chris Rasmussen and Michelle Zandieh	Inverse, Composition, and Identity: The Case of Function and Linear Transformation
	#80 Gail Tang	Student Thinking of Function Composition and its Impact on their Ability to Set up the Difference Quotients of the Derivative
	# 18 Craig Swinyard and Steve Strand	Definite Integral: A Starting Point for Reinventing Multiple Advanced Calculus Concepts

Session 18 – CONTRIBUTED REPORTS
SATURDAY, 9:50 – 10:20 AM

LOCATION	SPEAKER	TITLE
	#15 Ami Mamolo and Rina Zazkis	Challenging Convention: Mathematics Students' Resistance to the Unconventional
	#7 Olga Shipulina and David Smith	Calculus beyond the Classroom: Application to a Real-Life Problem Simulated in a Virtual Environment
	#8 Sandra Laursen and Marja-Liisa Hassi	Outcomes of Inquiry-Based Learning for Pre-Service Teachers: A Multi-site Study

COFFEE BREAK
SATURDAY, 10:20 – 10:50 AM

Session 19 – CONTRIBUTED REPORTS SATURDAY, 10:50 – 11:20 AM		
LOCATION	SPEAKER	TITLE
	#38 Matthew Inglis, Juan Pablo Mejia-Ramos, Keith Weber and Lara Alcock	On Mathematicians’ Different Standards When Evaluating Elementary Proofs
	#105 Gregory Wheeler	Assessment of College Students’ Understanding of the Equals Relation
	#95 Ian Whitacre	The Evolution of Classroom Mathematical Practices in a Mathematics Content Course for Prospective Elementary Teachers
Session 20 – PRELIMINARY REPORTS SATURDAY, 11:30 AM – 12:00 PM		
LOCATION	SPEAKER	TITLE
	#11 Keith Weber, Evan Fuller, Juan Pablo Mejia-Ramos, Kristen Lew, Philip Benjamin and Aron Samkoff	Do Generic Proofs Improve Proof Comprehension?
	#37 Rob Blaisdell	Student Understanding in the Concept of Limit in Calculus: How Student Responses Vary Depending on Question Format and Type of Representation
	#34 Mary Beisiegel, Joshua Chesler, Dana Cox, Rachael Kenney, Jill Newton and Jami Stone	The Status of Capstone Courses in the Preparation of Secondary Mathematics Teachers
	#48 Jim Brandt, Jana Lunt and Gretchen Rimmasch.	Doing Mathematics: Perspectives from Mathematicians and Mathematics Educators
	#89 Warren Code, David Kohler, Costanza Piccolo and Mark Maclean	Teaching Methods Comparison in a Large Introductory Calculus Class
	#87 Steve Strand, Sonya Redmond and Dov Zazkis	Summing Up Students’ Understandings of Sigma Notation
LUNCH SATURDAY, 12:00 AM – 1:15 PM		
PLENARY TALK SATURDAY, 1:30 – 2:30 PM		
<i>Reading processes and proof comprehension</i>		
Lara Alcock Mathematics Education Centre Loughborough University, UK		
Session 21 – CONTRIBUTED REPORTS SATURDAY, 2:40 – 3:10 PM		

LOCATION	SPEAKER	TITLE
	#21 Kuo-Liang Chang and Robert Floden	The Effect of Structure-based Instruction on the Transfer of Learning to Solve Algebra Word Problems
	#3 Elise Lockwood	A Model of Students' Combinatorial Thinking
	#9 Rina Zazkis and Ami Mamolo	Musings on infinite sample space
	#53 Leann Ferguson	Two parallel calculus: The one taught and the one used
COFFEE SATURDAY, 3:10 -3:40 PM		
Session 22 – THEORETICAL REPORTS SATURDAY, 3:50 – 4:20 PM		
LOCATION	SPEAKER	TITLE
	#14 Ami Mamolo	1+1= A Window: On the Polysemy of Symbols
	#44 Robert Ely and Iuliana Radu	Promoting students' object-based reasoning with infinite sets
	#47 Samuel Cook and Tim Fukawa-Connelly	Towards a description of symbol sense for statistics
Session 23 – CONTRIBUTED REPORTS SATURDAY, 4:30 – 5:00 PM		
LOCATION	SPEAKER	TITLE
	#77 Michael Smith	Embodiment of Struggle in Research Mathematicians: The Case of Proximal Inhibition
	#71 Megan Wawro, Christine Larson, Michelle Zandieh and Chris Rasmussen	A Hypothetical Learning Trajectory for Conceptualizing Matrices as Linear Transformations
	#93 Jana Talley	An Analysis of Calculus Instructor Grading Inconsistencies
Session 24 – CONTRIBUTED REPORTS SATURDAY, 5:10 – 5:40 PM		
LOCATION	SPEAKER	TITLE
	#64 Aviva Halani	Students' Ways of Thinking about Enumerative Combinatorics Solution Sets: The Odometer Category
	#40 Joshua Chesler	Preparing Mathematics Teachers to Teach Definitions
	#39 Jason Samuels	The Effectiveness of Local Linearity as a Cognitive Root for the Derivative in a Redesigned First- Semester Calculus Course
BREAK SATURDAY, 5:40 – 6:30 PM		

DINNER AND AWARDS & PLENARY TALK

SATURDAY, 6:30 – 9:00 PM

An Expanded Framing for Characterizing Mathematical Progression

Dr. Chris Rasmussen

San Diego State University & Center for Mathematics and Science Education

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