

# MATT THOMAS

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## EDUCATION

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- University of Arizona** *August 2013*  
Ph.D., Mathematics  
Thesis title: Analyzing Conceptual Gains in Introductory Calculus with Interactively-Engaged Teaching Styles  
Specialization: Mathematics Education  
Advisors: Guadalupe Lozano and Deborah Hughes Hallett  
Minor: Teaching and Teacher Education
- University of Arizona** *December 2009*  
M.S., Mathematics  
Thesis title: Approximation of the Dispersionless Toda Lattice by Toeplitz Operators  
Advisor: Hermann Flaschka
- Cornell University** *May 2006*  
B.A., Mathematics

## EXPERIENCE

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- Ithaca College** 2014 - Present  
*Assistant Professor* *Department of Mathematics*
- University of Central Arkansas** 2013 - 2014  
*Assistant Professor* *Department of Mathematics*
- University of Arizona** 2011 - 2013  
*Research Assistant for Nicole Kersting* *Department of Teaching, Learning & Sociocultural Studies*
- University of Arizona** 2006 - 2013  
*Teaching Assistant* *Department of Mathematics*

## PUBLICATIONS

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### *Peer reviewed journal articles*

**Thomas, M.**, Lozano, G., & Kersting N.B. (in preparation). A Comparison of Normalized Gains and Item Response Theory Gains on the Calculus Concept Inventory.

Gleason, J., White, D., **Thomas, M.**, Bagley, S., & Rice, L. (in preparation). The Calculus Concept Inventory: A Psychometric Analysis and Implications for Use.

Code, W., Merchant, S., Maciejewski, W., Thomas, M., & Lo, J. (2016). The Mathematics Attitudes and Perceptions Survey: An instrument to assess expert-like views and dispositions among undergraduate mathematics students. *International Journal of Mathematical Education in Science and Technology*.

### *Peer reviewed presented papers*

Lockwood, E., DeJarnette, A., & **Thomas, M.** (submitted). Algorithmic Thinking: An initial characterization of computational thinking in mathematics. *Submitted to PMENA-38*. Tucson, AZ

**Thomas, M.** & Peebles, C. (submitted). A Graph-Theoretic approach to the analysis of Contradances. *Submitted to Bridges Finland 2016*. Jyväskylä, Finland.

Weinberg, A. & **Thomas, M.** (2016). Students' Sense-making Practices for Video Lectures. *Proceedings of the Nineteenth Annual Conference on Research in Undergraduate Mathematics Education*. Pittsburgh, PA.

Martin, J., **Thomas, M.**, & Oehrtman, M. (2016). Supporting Students in Seeing Sequence Convergence in Taylor Series Convergence. *Proceedings of the Nineteenth Annual Conference on Research in Undergraduate Mathematics Education*. Pittsburgh, PA.

Gleason, J., White, D., **Thomas, M.**, Bagley, S., & Rice, L. (2015). The Calculus Concept Inventory: A Psychometric Analysis and Framework for a New Instrument. *Proceedings of the Eighteenth Annual Conference on Research in Undergraduate Mathematics Education*. Pittsburgh, PA.

Gleason, J., **Thomas, M.**, Bagley, S., Rice, L., White, D., & Clements, N. (2015). Analyzing the Calculus Concept Inventory: Content validity, internal structure validity, and reliability analysis. *Proceedings of the PMENA-37*. East Lansing, MI.

**Thomas, M.** (2014). The construction of a video coding protocol to analyze interactive instruction in calculus and connections with conceptual gains. *Proceedings of the Seventeenth Annual Conference on Research in Undergraduate Mathematics Education*. Denver, CO.

Kersting, N.B., Sutton, T., Kalinec Craig, C., Chen, M., Heshmati, S., Jablon Stoehr, K., **Thomas, M.**, & Goswami, G. (2014). Understanding the relationship between teacher value-added scores, instructional quality, and independent measures of student learning. *2014 Annual Meeting of the American Educational Research Association*. Philadelphia, PA.

**Thomas, M.**, & Lozano, G. (2013). Analyzing Calculus Concept Inventory Gains in Introductory Calculus. *Proceedings of the Sixteenth Annual Conference on Research in Undergraduate Mathematics Education*. Denver, CO. 2013.

## PRESENTED POSTERS

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“Psychometric Analysis of the Calculus Concept Inventory” with Diana White, University of Colorado Denver, Jim Gleason, University of Alabama, Spencer Bagley, University of Northern Colorado, Nathan Clements, University of Wyoming, and Lisa Rice, Arkansas State University Eighteenth Annual Conference on Research in Undergraduate Mathematics Education (RUME) Conference, Pittsburgh, PA, February 19-21, 2015

“Analyzing Conceptual Gains in Introductory Calculus With Interactively-Engaged Teaching Styles” Transforming Research in Undergraduate STEM Education (TRUSE) Conference, St. Paul, MN, June 3-7, 2012

“G-TEAMS” Regional NSF GK-12 Meeting, University of North Texas, Fort Worth, TX, November 14, 2009

## GRANTS

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### *Funded*

Ithaca Teachers' Math Circle (\$5,000+Travel funding), Math Teachers' Circle Network, Fall 2015, with Cristina Gomez

REACHE Grant: Learning From Video Lectures (\$1560), Spring 2015, with Aaron Weinberg

### *Not Funded*

Developing a Differential Calculus Concept Inventory (Co-PI), National Science Foundation. (\$250,000) with Diana White, University of Colorado Denver, Jim Gleason, University of Alabama, Spencer Bagley, University of Northern Colorado, Nathan Clements, University of Wyoming, and Lisa Rice, Arkansas State University (submitted 10/22/14)

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## TEACHING EXPERIENCE

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### *Ithaca College*

- 111: Calculus I (Fall 2014)
- 145: Statistics for Health/Life Sciences (Fall 2014, Fall 2015)
- 144: Business Statistics (Spring 2015, Spring 2016)
- 112: Calculus II (Spring 2015)
- 185: Math Experimentation (Fall 2015, Spring 2016)
- 316: Probability (Spring 2016)

### *University of Central Arkansas*

- 1496: Calculus I (Fall 2013)
- 1497: Calculus II (Spring 2014)
- 3351: Number Systems, course for pre-service elementary grade teachers (Spring 2014)
- 4320: Concepts of Calculus, course for pre-service middle grades teachers (Fall 2013)
- 4360: Supervisor for 7th grade student teacher (Fall 2013)

### *University of Arizona*

- Graduate Teaching Assistant for Mathematics Methods Classes for pre-service secondary teachers, (406B) Spring 2010 and (406A) Spring 2011
- Graduate Teaching Assistant, Primary Instructor for:
  - Intermediate Algebra (New Start Summer Program) Summer 2008
  - 112: College Algebra, Fall 2006 and Spring 2007
  - 120: Pre-Calculus, Fall 2007
  - 125: Calculus I, Fall 2008 and Spring 2009
  - 129: Calculus II, Fall 2011
  - 263: Introduction to Statistics and Biostatistics, Spring 2011
  - 302A: Mathematics for Elementary Education Majors, Spring 2008
 In addition to teaching, helped prepare video and worksheet lessons by videotaping middle school student interactions with mathematics questions (Wakefield Middle School, Tucson, AZ)

### *K-12 Professional Development and Mathematics Education Outreach*

- Instructor for “Intel Math” - 80 hour professional development course for K-8 in-service teachers
  - Chandler, AZ, February 2012 and September 2012

- Florence, AZ, June 2011 to March 2012
- Globe, AZ, October 2011 to February 2012
- Practicum at Miles Exploratory Learning Center, 3rd grade, August 2011 to December 2011
- NSF GK-12 fellow at Tucson High School, June 2009 to July 2010
  - Co-taught Pre-Calculus and Algebra 1 classes and brought in University speakers from the Mathematics Department at the University of Arizona

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## AWARDS AND FELLOWSHIPS

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Project STaR Fellowship, January 2015

Mathematics Department Teaching Award, University of Arizona, March 2012

Graduate Student Travel Grant Award, University of Arizona, March, 2012

VIGRE (Vertical InteGration of Research and Education) Fellowship, University of Arizona, Fall 2010

GK-12 Fellowship, University of Arizona, June 2009 to July 2010

Mathematics Department Service Award, University of Arizona, December 2009

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## OUTREACH AND SERVICE

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### *Service to Department*

#### *Ithaca College*

Departmental search committee, Fall 2015 - Spring 2016

Colloquium Organizer, May 2015 to present

Teacher Ed./MAT committee member, August 2014 to present

Member of statistics learning goals group, Fall 2014

#### *Univeristy of Central Arkansas*

Committee member, University of Central Arkansas, August 2013 to May 2014:

- Hiring search committee (elected)
- Mathematics education committee
- Technology committee
- Calculus committee
- Departmental library liaison

#### *University of Arizona*

Graduate Student Representative to Undergraduate Education Committee, University of Arizona, August 2008 to May 2010

Founder and facilitator of Mathematics Education Graduate Student Brown Bag Seminar, University of Arizona, January 2010 to May 2010

Mathematics “Department Tea” Co-organizer, University of Arizona, August 2008 to May 2009

Incoming TA “grading workshop,” training for new teaching assistants, University of Arizona, August 2008 and August 2009

Assisted with the AP Calculus Practice Test, University of Arizona, April 2008 and April 2009

### ***Service to College***

#### *Ithaca College*

Member of Middle States Accreditation working group - Standard III, Student Learning, January 2016 - present

Presenter for Ithaca Today, April 12, 2015

Volunteer for IC Open House, September 27, 2014 and October 4, 2014

#### *University of Arizona*

Graduate and Professional Student Travel Grant Judge, University of Arizona, April 2012

### ***Service to Profession***

Member of Local Organizing Committee: Psychology of Mathematics Education, North America (PME-NA) Conference, Tucson, AZ, 2016

Development of Statistics Labs using software R Commander in conjunction with OpenIntro open source statistics project, <https://www.openintro.org/about.php>.

Interviewer for Central New York Region Master Teacher Program, November 8th, 2014

Reviewer for Psychology of Mathematics Education, North America (PME-NA) Conference, 2015-2016

Reviewer for Research in Undergraduate Mathematics Education (RUME) conference proceedings, 2013-2016

Mathematics Judge for the 2014 ISEF State Science Fair, University of Central Arkansas, Conway, AR, April 4, 2014

Mathematics Professional Development Day for Elementary School Teachers, Ithaca, NY, October 7, 2014

Master Teachers Workshop on “Exploding Dots,” SUNY Cortland, Cortland, NY, September 6, 2014

### ***Outreach***

Co-founder and monthly presenter (with Cristina Gomez) of the Ithaca Math Teachers’ Circle, August 2015 to present

“Flexagons,” Math Exploration Day, Ithaca College, April 13th, 2015

“Mathematical Card Tricks,” Math Day, Ithaca College, Ithaca, NY, November 15, 2014

Co-founder, weekly presenter, and organizer of the Tucson Math Circle for middle and high school students, August 2008 to September 2010

Founder and weekly organizer of second Tucson Math Circle at Tucson High School, August 2009 to May 2010

“The Prisoner’s Dilemma and Evolutionary Game Theory,” Advanced Biology classes at Salpointe Catholic High School, Tucson, AZ, October 20, 2009

“Math Fair” at University High School, Tucson, AZ, March 13, 2009

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## PROFESSIONAL DEVELOPMENT AND WORKSHOPS

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### *Professional Development*

Early Career Excellence Institute, Center for Faculty Excellence, Ithaca College, January 2015 - December 2015.

Member of the Upstate New York IBL (Inquiry-Based Learning) Consortium, Spring 2016

### *Workshops*

Mapping the Calculus Curriculum Workshop, Institute for Mathematics and Education, University of Arizona, Tucson, AZ, March 27 - 29, 2010

Circle on the Road, Mathematical Sciences Research Institute workshop, Phoenix, AZ, March 13-15, 2010

Great Circles Workshop, Mathematical Sciences Research Institute, Berkeley, CA, April 16 - 17, 2009

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## INVITED TALKS AND PRESENTATIONS

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### *Invited talks*

Measuring Conceptual Understanding in Calculus, Ohio State Math Education Forum, August 5, 2015

### *Presentations*

- “Psychometrics: What That Buzzfeed Quiz Actually Tells You” World of Math Course, Ithaca College, Ithaca, NY, March, 8, 2016
- “Virtual Manipulative Supporting Sequence Convergence in Taylor Series Convergence.” Oklahoma-Arkansas MAA Regional Meeting, Conway, AR, April 1-2, 2016 (Presentation given by Jason Martin, with additional author Michael Oehrtman)
- “Mathematics Attitudes and Perceptions Survey: Assessing Students’ Expert-like Conceptions of Mathematics.” Joint Mathematics Meetings, Seattle, WA, January 6, 2016 (Presentation given by Warren J. Code, with additional authors Joseph Lo, Wes Maciejewski, and Sandra Merchant)
- “Psychometrics: Testing the test” IC Math Sophomore Seminar, Ithaca College, Ithaca, NY, February 24, 2015
- “Analyzing Interactively-Engaged Instruction and Conceptual Gains in Introductory Calculus” UCA Research in STEM Education Seminar, Department of Mathematics, University of Central Arkansas, Conway, AR, April 4, 2014
- “Analyzing Conceptual Gains in Introductory Calculus with Interactively-Engaged Teaching Styles” Department of Mathematics, Ithaca College, Ithaca, NY, March 18, 2014
- “The Construction of a Video Coding Protocol to Analyze Interactive Instruction in Calculus and Connections with Conceptual Gains” 17th Annual Conference on Research in Undergraduate Mathematics Education, Denver, CO, March 1, 2014
- “An Introduction to R” Software Interest Group, Department of Mathematics, University of Arizona, March 25, 2013

- “Analyzing Calculus Concept Inventory gains in introductory calculus” 16th Annual Conference on Research in Undergraduate Mathematics Education, Denver, CO, February 22, 2013
- “Teaching Interactively” Undergraduate Teaching Assistant presentation, University of Arizona, February 12, 2013
- “Measuring Interactive-Engagement in College Calculus Classrooms” University of Central Arkansas, February 8, 2013
- “Measuring Interactive-Engagement in College Calculus Classrooms” Mathematics Graduate Student Colloquium, University of Arizona, February 6, 2013
- “Exploding Dots” Mathematics Educator Appreciation Day Conference, Tucson, AZ, January 25, 2013
- “Analyzing Conceptual Gains in Introductory Calculus with Interactively-Engaged Teaching Styles” Joint Mathematics Meetings, San Diego, CA, January 9-12, 2013
- “Developing a Protocol for Analyzing the Quality of Classroom Interactions in an Undergraduate Calculus Course” Joint ArizMATYC, MAA Southwestern Section and SunMaRC Conference, March 30 to April 1, 2012
- “Developing a Protocol for Analyzing the Quality of Classroom Interactions in an Undergraduate Calculus Course” Joint Mathematics Meetings, Boston, MA, January 4-7, 2012
- “Measuring Interactive Engagement in Calculus Classes” Mathematics Instruction Colloquium, University of Arizona, November 29, 2011
- “Exploding Dots” Tucson Teachers’ Circle, University of Arizona, February 17, 2011
- “GTEAMS” Mathematics Instruction Colloquium, University of Arizona, November 3, 2010
- “Exploding Dots” K-12 Mathematics: Hands on, Minds on Application Workshop, Biosphere 2, Tucson, AZ, October 23, 2010
- “G-TEAMS: Bringing Grad Students Into K-12 Classrooms” Mathematics Instruction Colloquium, University of Arizona, September 28, 2010
- “Interesting and Fun Problems from the Tucson Math Circle” Mathematics Educators Appreciation Day, Tucson, AZ, January 30, 2010
- “G-TEAMS: Grad Students and Teachers Together” Mathematics Educators Appreciation Day, Tucson, AZ, January 30, 2010
- “Conceptual Knowledge of Introductory Calculus” Mathematics Education Graduate Student Brown Bag, University of Arizona, December 7, 2009
- “Reflections on the Math Circle” Mathematics Instruction Colloquium, University of Arizona, December 1, 2009
- “A Taste of the Tucson Math Circle” Mathematics Instruction Colloquium, University of Arizona, February 17, 2009
- “A Beginner’s Guide to Geometric Quantization” Mathematics Graduate Student Colloquium, University of Arizona, February 4, 2009
- “Some Interesting Investigative Questions from the Tucson Math Circle” Mathematics Educators Appreciation Day, Tucson, AZ, January 24, 2009

- “Tensegrities and Rigidity” Mathematics Graduate Student Colloquium, University of Arizona, March 12, 2008
- “The Geometry of Polygon Spaces” Research Tutorial Group Mini-Conference, University of Arizona, December 6, 2007

## **PROFESSIONAL MEMBERSHIPS**

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Mathematical Association of America (MAA)

Association of Mathematics Teacher Educators (AMTE)

National Council of Teacher of Mathematics (NCTM)

American Mathematical Society (AMS)

North American Chapter of the International Group for the Psychology of Mathematics Education (PME-NA)