GUADALUPE INÉS LOZANO

Curriculum Vitae

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Citizenship:
US (Argentina native)

EDUCATION

- THE UNIVERSITY OF ARIZONA, Tucson, AZ
  Ph.D. in Mathematics, June 2004 (GPA: 4.00/4.00)
  Dissertation: *Poisson geometry of the Ablowitz–Ladik equations*. Director: Nicholas Ercolani
- THE UNIVERSITY OF ARIZONA, Tucson, AZ
  MS in Mathematics (GPA: 4.00/4.00)
- WHITWORTH UNIVERSITY, Spokane, WA
  BS in Mathematics (GPA: 3.90/4.00)

RESEARCH INTERESTS

- Mathematical thinking, cognition, and identity.
- Cognitive issues in the teaching and learning of differential and integral calculus.
- Past Research Work: Symplectic and Poisson geometry of differential equations.

PUBLICATIONS

- *Students' Mathematical Achievement and General Knowledge in a Multicultural Mathematics Course* (w/ D. Winter). In preparation, 2010.
- *Teachers Task Management Practices in the Context of Routine and Non-Routine Mathematics Problems: A Descriptive Analysis*. In Transnational and Borderline Studies in Mathematics Education, Civil, M. & Kitchen, R. (Eds.). Routledge: expected release 2011.
- *A bi-Hamiltonian structure for the integrable, discrete non-linear Schrödinger system* (with Nick Ercolani). Physica D 218 (2006), no. 2, 105–121.
- *Poisson geometry of the Ablowitz–Ladik Equations*. Ph.D. dissertation. University of Arizona (2004).
- *The Geometry of Polygons in $\mathbb{R}^5$ and Quaternions* (with Philip Foth). Geometriae Dedicata 105 (2004), 209–229.
- *A Dynamic Software Visualization Tool for Calculus Instruction at the College-entry Level*. Proceedings of the Annual Meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education (22nd, Tucson, Arizona, USA, October 2000). Volume 2, p 703.

EMPLOYMENT

- **Executive Director, Institute for Mathematics and Education (IM&E)**, University of Arizona, Department of Mathematics, 2009–present: established and developed private donor and private foundation relations, working in collaboration with the Arizona Foundation; oversaw outreach implementation and dissemination of programs for teachers and students; and developed sustainable collaborations between the IM&E, Tucson area school district authorities, local businesses and other local and national educational units.
- **Visiting Assistant Professor**, University of Arizona, Department of Mathematics, 2009–present.

- **CEMELA Postdoctoral Research Fellow**, University of New Mexico, Department of Educational Specialties, 2007–2009: CEMELA (Center for the Mathematics Education of Latinos/as) was a multi-university center for learning and teaching supported by NSF grant ESI-0424983.
- **La Meta Post-Doctoral Fellow**, University of New Mexico, Department of Mathematics, 2007–2009: designed and facilitated content-based professional development for in-service middle-school mathematics teachers. La Meta was a grant-funded program federally supported through the New Mexico Public Education Department.
- **Post-Doctoral Fellow**, University of New Mexico, Department of Mathematics, 2007–2009.
- **Post-Doctoral Assistant Professor**, University of Michigan, Department of Mathematics, 2004–2007.
- **VIGRE Research Associate**, University of Arizona, Department of Mathematics, 2000–2003.
- **Teaching Associate/Assistant; Summer Session Instructor**, University of Arizona, Department of Mathematics, 1997–2004.
- **Summer Camp Counselor**, Arizona Summer Mathematics Program for Gifted Junior High School Students, 1998–1999: mentored junior high school students during a two-week math camp.
- **Undergraduate Teaching Assistant**, Whitworth University, Department of Philosophy, 1996: led weekly discussions and exam preparation sessions for upper division undergraduate philosophy of science course.

CONSULTING

- ***Houghton Mifflin Publishing***: reviewed a first edition pre-calculus text (2007).
- ***Faculty Associates for Multicultural Teaching Innovations (FAMI) Grant*** (funded by the Center for Research on Learning and Teaching–CRLT, University of Michigan): authored a series of precalculus modules (content & pedagogy) based upon current multicultural issues of socio-economical relevance (2005).
- ***John Wiley & Sons, Inc.***: designed problems for and co-revised the third edition of the textbook *Calculus* by Hughes-Hallett, Gleason, et al. (2000).

TEACHING EXPERIENCE

MULTI-SECTION COURSES DIRECTED (coordinated and supervised instructors; wrote uniform exams):

- Data, Functions and Graphs (Precalculus), University of Michigan, 2005, 2007.
- Calculus I (Differential), University of Michigan, 2006.
- Calculus II (Integral), University of Michigan, 2005.

IBL COURSES TAUGHT (Inquiry-based curriculum; assumed full responsibilities for the class):

- Mathematics for Elementary and Middle School Teachers, University of Michigan, 2007.
- Principles of Analysis, University of Michigan, 2006.

OTHER COURSES TAUGHT (assumed full responsibilities for the class):

- Professional Development Workshop in Teaching Mathematics (Graduate Level), University of Arizona, 2009, 2010.
- Introduction to Non-Euclidean Geometries (Graduate Level), University of New Mexico, 2009.
- Mathematics from a Historic Perspective, University of New Mexico, 2008.
- Analyzing and Abstracting Student-generated Arguments: A Mathematics Topics Course for Elementary and Middle School Teachers, University of New Mexico, 2008.
- Mathematics for Elementary and Middle School Teachers, University of New Mexico, 2007, 2009.
- Calculus II (Integral), University of Arizona (2001), University of Michigan (2005).
- Data, Functions and Graphs (Precalculus), University of Michigan, 2004, 2005.
- Math for Business Decisions (Introduction to applied probability), University of Arizona, 2004.
- Calculus III (Multivariable), University of Arizona, 2000.
- Calculus I (Differential), University of Arizona, 1999.

- Business Calculus (Applied differential calculus), University of Arizona, 1999.
- College Algebra, University of Arizona, 1998.
- Introduction to College Algebra, University of Arizona, 1997.

COURSES TEAM-TAUGHT:

- Math for Central-American Elementary School Teachers (taught in Spanish), University of Arizona, Summer 2003.
- Introduction to Ordinary Differential Equations, University of Arizona, Spring 2002.

OTHER:

- Ran mentoring/help sessions for students in the Graduate Research Tutorials on *Mathematics Education* and *The Geometry of Polygons*, University of Arizona, 2000, 2002.
- Led PhD qualifying exam preparation sessions for first-year graduate students studying for the Geometry-Topology qualifier, University of Arizona, Summer 1999.

SERVICE

- **Reviewer.** Math Reviews, American Mathematical Society (AMS), 2004–present.
- **CEMELA Teacher Study Group Faculty Participant.** University of Arizona, 2009–2010: worked with elementary and middle school teachers and university faculty/researchers exploring mathematical content and pedagogies for diverse learners.
- **Mini-symposium co-organizer.** (Semiclassical and Continuum Limits). SIAM Conference on Nonlinear Waves and Coherent Structures. University of Washington, Seattle, WA, 2006.
- **Invited panelist.** Office of undergraduate admissions and College of Literature, Science and Arts (LSA), University of Michigan, 2006: spoke on behalf of LSA to promote the Mathematics Department to admitted freshmen and their parents.
- **Freshman-Sophomore Program Committee member.** Department of Mathematics, University of Michigan: trained, evaluated and mentored new instructors of multi-section calculus and precalculus courses, 2004, 2005.
- **Graduate student recruiter.** Society for the Advancement of Chicanos and Native American in Science (SACNAS) annual conference: evaluated undergraduate research, mentored and recruited prospective students of the College of Literature, Science and Arts, University of Michigan, 2004, 2005.
- **TA representative (elected).** Mathematics Undergraduate Committee, University of Arizona, 2000–2002.
- **Co-founder, organizer.** Mathematics Education Research Colloquium, University of Arizona, 2001.
- **Graduate Student Representative (elected).** Mathematics Graduate Committee, University of Arizona, 1999–2000.
- **Co-founder, organizer.** First and Second Annual Mathematics Graduate Day Mini-Conference, University of Arizona, 1999–2000.
- **Organizer.** Grad Student Math Colloquium, University of Arizona, 1998–1999.

TALKS

INVITED TALKS

- *The teacher's role in the context of a mathematical task: identifying and managing opportunities for student engagement in analytical thinking.* Centre for Research and Advanced Studies of the National Polytechnique Institute (Cinvestav), Mathematics Education Department, Mexico City, Mexico, March 2010.
- *Teachers' Management of Mathematics Tasks Associated to Routine and Non-routine Problems: a Look at 5th and 6th Grade Classrooms in a Quality Mexican School in the US-Mexico Border.* Research and Innovation in Mathematics and Science Education (RIMSE) Center, Arizona State University, March 2009.
- *Panel discussion on Inquiry-based learning AMS-MAA Special Session on Inquiry-Based Learning.* AMS Joint Mathematics Meetings. Washington, DC, January 2009.

CONTRIBUTED TALKS: MATHEMATICS EDUCATION

- *Racing to the Top through Stopping to Think: Metaphors in Teachers Talk and National Policy.* (Joint work with Marcy B. Wood.) American Educational Research Association (AERA) 2010 Annual Meeting. Denver, CO, May 2010.
- *Racing to the Top through Stopping to Think: Metaphors in Teachers Talk and National Policy - poster presentation* (Joint work with Marcy B. Wood.) CEMELA-TODOS-CPTM Conference. Tucson, Arizona, March 2010.
- *Understanding, abstracting, and building upon students mathematical reasoning: a new course for prospective elementary and middle school Teachers.* AMS-MAA-MER Special Session on Mathematics and Education Reform, I. AMS Joint Mathematics Meetings. Washington, DC, January 2009.
- *Using Mathematics Classroom Observation Protocols.* Working Group on Transnational and Borderland Research Studies in Mathematics Education, PME-NA Twenty-ninth Annual Conference. Lake Tahoe, Nevada, October 2007.
- *Mathematical Knowledge and Mathematical Analysis: Vignettes of Mexican Classrooms.* CEMELA Seminar, University of New Mexico. Albuquerque, NM, March 2008.
- *A Guide to Mathematics Education Research for Instructors: What, How, Why?* (Joint work with Jennifer Smith.) Mathematics Education Research Colloquium, University of Arizona. Tucson, AZ, January 2001.
- *On Students Understanding of Functions, Derivatives, and Derivative Functions: What the Research Says and What We Can Do About It.* Mathematics Instruction Colloquium, University of Arizona. Tucson, AZ, November 2000.
- *Influence of Dynamic Software Visualization Tools on the Development of Undergraduate's Concept Image of Derivative Function.*
  SIGMAA-RUME Fifth Annual Conference. Chicago, IL, September 2000.
- *A Dynamic Software Visualization Tool for Calculus Instruction at the College-entry Level - poster presentation.*
  PME-NA Twenty-second Annual Conference. Tucson, AZ, October 2000.

CONTRIBUTED TALKS: ANALYSIS

- *A Riemann-Hilbert approach to the continuum limit of the Ablowitz–Ladik equations: initial calculations.* (Joint work with Jeffery DiFranco.)
  Integrable Systems Working Group, University of Michigan. Ann Arbor, MI, September 2005.
- *Ablowitz–Ladik hierarchy of integrable flows and orthogonal polynomials on the unit circle (Joint work with Jeffery DiFranco.)*
  Integrable Systems Working Group, University of Michigan. Ann Arbor, MI, February 2005.

CONTRIBUTED TALKS: GEOMETRY (Selected)

- *Hydrodynamic Poisson brackets and Whitham equations for completely integrable systems: an overview.*
  Integrable Systems Working Group, University of Michigan. Ann Arbor, MI, March 2006.
- *Poisson geometry of polygons and linkages - Parts I and II.*
  Geometry Seminar, and Geometry Working Group, respectively, University of Michigan. Ann Arbor, MI, March 2005.
- *Poisson Geometry of the Ablowitz–Ladik Equations.*
  New faculty capsule talks, University of Michigan. Ann Arbor, MI, September 2004.
- *Poisson Geometry of the Ablowitz–Ladik Equations - poster presentation.*
  South East Geometry Conference - Charleston, SC, March 2003.
- *Integrable Dynamics of Geodesic Linkages on the 2-sphere, Parts I and II.*
  Graduate Geometry Seminar, University of Arizona. Tucson, AZ, March 2002.
- *Uniqueness of Moment Maps: A Neat Application of Lie Algebra Cohomology.*
  Graduate Student Mathematics Colloquium, University of Arizona. Tucson, AZ, October 2000.
- *Symplectic Structure of Euclidean Polygons, Parts I and II.*
  Graduate Geometry Seminar, University of Arizona. Tucson, AZ, April, May 2000.
- *Surfaces, Lattices and Metrics: Some Examples.*
  14th Annual Mathematics Graduate Student Recruiting Workshop, University of Arizona. Tucson, AZ, March 2000.

OUTREACH

- Member of the Planning Group, Wildcat Middle Charter School, University of Arizona. Tucson, AZ, 2009.
- Designed and coordinated five NSF-sponsored workshops in which teams of grads and undergrads introduced elementary school students, their teachers and parents to the mathematics of games and puzzles. The workshops were part of the *Girls in the SYSTEM* NSF-funded project (Professor M. Civil, primary investigator), Tucson, AZ, 2003.
- Co-organized and ran two NSF-supported workshops for high-school students: *Take that, Euclid! Explorations in Hyperbolic Geometry* and *Einstein's Way Cool Notion of Motion*, University of Arizona, 1998, 2000.
- Judged grad and undergrad research in math and science at the *10th Annual Student Showcase*, University of Arizona , 2002.
- Judged elementary school projects in math and science at the *Southern Arizona Regional Science and Engineering Fair*, Tucson, AZ, 2000.

HONORS

- College of Science Outstanding Graduate Teaching Assistant Award, University of Arizona, 2003.
- Department of Mathematics Graduate Teaching Award, University of Arizona, 2000, 2002.
- NSF VIGRE Graduate Fellowship, 2000–2003.
- Whitworth College International Student Grant, 1994–1996.

PROFESSIONAL MEMBERSHIPS

- American Educational Research Association (AERA).
- American Mathematical Society (AMS).
- Mathematical Association of America (MAA).
- Society for the Advancement of Chicanos and Native American in Science (SACNAS).

OTHER SKILLS

- Fluent in Spanish.
- C/C^{++}, HTML, Mathematica.
- Smart Board, Geometer's Sketchpad.