Lisa Berger

CONTACT INFORMATION

Mathematics Department
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CITIZENSHIP

United States

RESEARCH INTERESTS

My mathematics research is in number theory and arithmetic geometry. In recent work I study elliptic curves and higher dimensional abelian varieties defined over function fields and finite fields. My scholarly work in education focuses on academic and policy issues in mathematics teacher education.

EDUCATION

University of Arizona, Tucson, Arizona USA

Ph.D. Mathematics, August 2007
Thesis: Ranks of Abelian Varieties in Towers of Function Fields
Advisor: Professor Douglas Ulmer

B.S. Education, May 1992
Mathematics Major, Spanish Minor
Graduated Cum Laude

PROFESSIONAL APPOINTMENTS

Affiliated Faculty Member, Department of Technology and Society, CEAS Stony Brook University, 2015 -
Associate Professor, Stony Brook University, 2013 -
Assistant Professor, Stony Brook University, 2007 - 2013

Graduate Assistant/Associate, University of Arizona, Fall 2001 - Spring 2007

Mathematics Teacher, Sunnyside School District, Tucson, AZ, Summers 2001, 2004.
Teaching Co-op (Visiting Instructor), University of Arizona, Fall 1999-Spring 2000.
Mathematics Teacher, Desert View High School, Tucson. Fall 1995 - Spring 2001.

Mathematics Teacher, Fall 1992-Spring 1994. Creighton School, Phoenix. Fall 1992-Spring 1994.

REFEREED PUBLICATIONS

Mathematical Language and the Common Core Standards for English. *English Journal* 102.5 (2013), 16-20.

Equivalence Relations Across the Secondary School Curriculum. *Mathematics Teacher* 106 (2013), 508-512.

Elliptic curves with bounded ranks in function field towers. *Acta Arithmetica* 156 (2012), 301-323.

Universal number partition problem with divisibility. (with Dror, M. and Lynch, J.) *Discrete Mathematics* 312 (2012), 1692-1698.
Lynch contributed while student in Master of Arts in Teaching Mathematics degree program.

The ℓ-rank structure of a global function field. (with J.-L. Hoelscher, Y. Lee, J. Paulhus and R. Scheidler) *Fields Institute Communications* **60**, American Mathematical Society, Providence, RI, (2011), 145-166.

Towers of surfaces dominated by products of curves and elliptic curves of large rank over function fields. *Journal of Number Theory* 128 (2008) 313-330.

SUBMITTED WORK

Attending to Precision: Mathematical Definitions in Courses for Pre-Service and Practicing Teachers. Revised. (2016).

Explicit arithmetic of Jacobians of generalized Legendre curves over global function fields. (with Hall, C., Pannekoek, R., Park, J., Pries, R., Sharif, S., Silverberg, A., and Ulmer, D.) vi +121 pages. http://arXiv.org/abs/1505.00021 (2015).

Recent Presentations

Special Session on Mathematicians in Mathematics Education, AMS Spring Eastern Section Meeting, (with Melkana Brakalova), March 2016.
SIAM Conference on Applied Algebraic Geometry, August 2013.
Mathematics Education Seminar, University of Texas San Antonio, March 2013.
Guest Educator, National Museum of Mathematics, New York, December 2012.
Collaborative Number Theory Seminar, CUNY Graduate Center, April 2012.
Front Range Algebra GeoMEtry and Number Theory Seminar, CO State University, December 2011.
Mathematics Colloquium, California State University, Chico. February 2011.
Pi Mu Epsilon Induction Ceremony, Fordham University. May 2010.
AMS Easter Section, Pennsylvania State University. October 2009.
Seminar in Number Theory and Cryptography. University of Calgary. July 2009.
Algebra Seminar. Wesleyan University. April 2009.
Association for Women in Mathematics, Workshop for Women Graduate Students and Recent Ph.D.'s, Joint Math Meetings, Washington, DC. January 2009.
Women in Numbers, Working group presentation (with Jing Long Hoelscher), Banff International Research Station. November 2008.
ORCA Math Conference for Undergraduates and Teachers, California State University, Chico. 2008.
Special Session on Number Theory in the Southwest, AMS 2007 Spring Western Section Meeting.
Department of Mathematics and Statistics, Hunter College of CUNY. Spring 2007.
Mathematics Department, North Carolina State University. Spring 2007.
Mathematics Department, Columbus State University. Spring 2007.
Mathematics Department, California State University, Fresno. Spring 2007.
Department of Mathematics and Statistics, Georgia State University. Spring 2007.
Mathematics Department, California State University, Fullerton. Spring 2007.
Department of Mathematics and Statistics, California State University, Monterey Bay. Fall 2006.
Preparing Future Faculty Seminar, Dept. of Math and Stats., Arizona State University. Fall 2006.
Mathematics Colloquium, University of Nebraska, Omaha. Fall 2006.

Professional Middle School and High School Teaching

Sunnyside School District Tucson, Arizona

Pre-algebra. (Special summer program for incoming freshmen.)

Desert View High School Tucson, Arizona
Courses taught in bilingual Spanish/English and in mainstream classrooms.

Pre-Algebra	Integrated Math I	AP Calculus
Algebra I	Integrated Math II	
Algebra II	Integrated Math IV	

Creighton School Phoenix, Arizona
Courses taught in bilingual Spanish/English and in mainstream classes. Worked in collaborative team consisting of language arts, social studies, mathematics and science teachers.

Eighth grade mathematics
Algebra

Marcos de Niza High School Tempe, Arizona (Student Teacher)
Pre-calculus
Honors geometry
Basic arithmetic

Professional University Teaching

Stony Brook University Mathematics Department

MAT 127	Calculus C
WSE 187	Introduction to Research Co-instructor, Number theory mini-course for *Women in Science and Engineering* program.
MAT 313	Abstract Algebra
MAT 512	Algebra for Teachers
MAT 513	Analysis for Teachers
MAT 515	Geometry for Teachers
MAE 301/501	Foundations of Secondary School Mathematics
MAE 311/510	Introduction to Teaching Secondary School Mathematics
MAE 447/530	Directed Readings in Mathematics Education
MAE 302/520	Advanced Methods of Teaching Mathematics
MAE 540	Clinical Experience
MAT 487	Independent Study 2 students over 2 semesters. Number theory and cryptography.
MAT 599	M.A. Research 9 students over 8 semesters and 2 summers Reading courses in elementary number theory, algebra, and geometry. Research projects in elementary number theory and mathematics education.
HON 496	Honors College Senior Project 2 students over 4 semesters. Research projects in mathematics education.
MAT/MAE 698	Independent Study, Ph.D. Advisee.
MAT/MAE 699	Dissertation Research

University of Arizona Mathematics Department

Math 110 Instructor	College Algebra
Math 111 Instructor	Trigonometry
Math 124 Instructor	Calculus I
Math 129 Instructor	Calculus II
Math 215 Instructor	Linear Algebra
Math 223 Instructor	Multivariable Calculus
Math 301 Instructor	Understanding Elementary Mathematics (Required content course for pre-service elementary teachers)
Math 323 Assistant	Formal Mathematical Reasoning and Writing
Math 511ab Assistant	Graduate Algebra Core Course
Math 407 Assistant	Synthesis of Mathematical Concepts (Capstone mathematics course for pre-service secondary math teachers)

Thesis Students Stony Brook

Ramón Emilio Fernández, Ph.D. Technology, Policy and Innovation. Department of Technology and Society, College of Engineering and Applied Sciences. August 2016. *A quantitative policy analysis of Bronx County public high school students' mathematics course-completion.*
First position: Tenure Track Assistant Professor, Mathematics Department, Pace University.

Kevin Maritato Honors Senior Thesis 2011-2012.

Christina Domanico Honors Senior Thesis 2008-2009.

External Funding

Robert Noyce Teacher Scholarship Program, Co-PI. (August 2010–July 2017) National Science Foundation. Total amount funded is $749,487.

American Mathematical Society, Epsilon Fund, PI. Funding for Stony Brook Mathematics Camp,

summer 2010. Total amount funded was $7500.

Robert Noyce Scholarship Program Supplemental, Co-PI. (January 1 2009-December 31, 2011.) National Science Foundation. (08-497) Total amount funded is $99,210.

Ligase Robert Noyce Scholarship Program, Co-PI. (Sept. 2007-Dec. 2009). National Science Foundation. (05-528). Grant funded from 1/01/06. Total amount funded was $497,946.

Association for Women in Mathematics, Sonia Kovalevsky Days, One of 3 joint PI's. February 2006 and February 2007. Funded $1200 each year.

Grants and Fellowships

AWM/NSF Travel Grant for SIAM Conference on Applied Algebraic Geometry, August 2013.
Drescher Program Award for Research Assignment, January 2011-May 2011.
NSF Funding to Participate in Research Program on Arithmetic Geometry, CRM, Barcelona, February 2010.
National Science Foundation VIGRE Fellowship
- Academic Years 2006-2007 and 2004-2005
- Summers 2002 and 2003

Summer Fellowship from NSF Grant DMS 0400877 and 0701053
- Summers 2006 and 2007

Graduate Tuition Fellowship
- Academic Year 2005-2006

External Service

Collaborating with Annette Scheidler, TESOL Program Director, on a new project with Riverhead Schools. Goal is to provide support in improving elementary and secondary mathematics instruction for English Language Learners.

Co-organizer: AMS Special Session on Mathematicians in Mathematics Education. AMS Eastern Section Meeting, Stony Brook, NY. Spring 2016.

Collaborating with Stony Brook Center for Science and Mathematics Education in academic organization of the SUNY Master Teacher Program Long Island cohort groups. Work involves assisting local, secondary mathematics Master Teachers in organizing and implementing professional development activities leading to improved knowledge of mathematics, of pedagogy, and of students. Fall 2013 – Present

Reviewer/Judge: Rosenthal Prize for Innovation in Math Teaching. Awarded by the National Museum of Mathematics to an upper-grade mathematics teacher. Summers 2016, 2015, 2014, and 2013.

Committee Member of the PARCC Math Core Leadership Review Committee.
I served as a higher education representative from New York State, a governing state of the PARCC consortium, of 23 states. Committee work was to review mathematics assessment items and exam forms written to assess student mastery of the Common Core State Standards for Mathematics. I reviewed items for various middle grades and high school assessments. 2012-2014.

Reviewer/Referee for AMS Mathematical Reviews, Mathematics Teacher,
Journal of Number Theory, The American Mathematical Monthly 2009-present.

External Reviewer for St. Joseph's College new MA degree for in-service secondary mathematics teachers and combined BS/MA degree programs. 2009-2010.

Academic Decathlon Mathematics Coach Desert View High School, Tucson. I taught students traditional high school mathematics in addition to some special topics. Fall 2000-Spring 2005.

Reviewer for 21st Annual Symposium on Computational Geometry. 2005.

University Service

Faculty Mentor for Ankit Patel, an undergraduate mathematics major. URECA funded summer research project. Studying distribution of irregular primes. Summer 2016.

Organizing third set of mathematics interviews for the SUNY Master Teacher Program, and serving as one interviewer. July-August 2016.

Taught two-session course “Public Key Cryptography" for the CAS Pre-College Summer Institute, June 2016.

Doctoral Thesis Committee Member for Luisa McHugh, Ph.D. in Science Education. Spring 2016.

Academic Advising for Freshman and Transfer Students. Stony Brook University. Summer 2016, Summer 2015, Summer 2013, Summer 2012, December 2011, Summer 2010, December 2009, Summer 2009.

Participated in several meetings, and coordinated teacher candidate and faculty participation, during the current 2016 NCATE/CAEP accreditation cycle. Fall 2015-Spring 2016. Result is Program Accreditation with No Areas for Improvement.

Worked on Standard One committee for the 2016 NCATE/CAEP accreditation cycle. Completed, with Linda Padwa and Nicole Galante, the portion of the Institutional Report on Candidate Content Knowledge. Fall 2014-Spring 2015.

Completed Specialized Professional Association Report for National Council of Teachers of Mathematics. Required for National Recognition of all Mathematics Teacher Certification Programs and required step for unit-wide NCATE/CAEP program accreditation. Resulting in National Recognition with No Conditions. 2013-2015.

Organized second set of mathematics interviews for SUNY Master Teacher Program and also served as an interviewer. November 2014.

Organized first set of mathematics interviews for SUNY Master Teacher Program and also served as an interviewer. February 2014.

Program Director Mathematics Education Program. Professional Education Program, Stony Brook University. Fall 2010-Present.

Served on Robert Noyce Mathematics and Science Fellowship selection committee in 2008 and in 2009.

In academic year 2007-2008 I served as PEP acting director of graduate mathematics education program.

Departmental Service

Grader for PhD Comprehensive Exam. Mathematics Department. Stony Brook University. August 2016, August 2014, August 2011 and August 2008.

Undergraduate Committee. Mathematics Department. Stony Brook University. Approximately 6 semesters, Fall 2008-Spring 2014.

Completed proposal for advanced degree certificate in elementary mathematics. Fall 2014.

Stony Brook Mathematics Camp Founding Co-Director and Course Instructor, Summers 2009 and 2010. Course Instructor, Summer 2012.

Program Co-Director, Mathematics Education Program, Professional Education Program, Stony Brook University. Primary responsibility for advising Master of Arts in Teaching Mathematics Degree program students and combined BS/MAT students. Fall 2008-Spring 2010

Committee Co-chair. NCATE (National Council for Accreditation of Teacher Education) Committee on Teacher Candidate Content Knowledge. Professional Education Program, Stony Brook University. Spring 2008 to Spring 2009.

Acting Director Graduate Mathematics Education, Professional Education Program, Stony Brook University. Fall 2007-Spring 2008.

Graduate Committee GTA Representative University of Arizona, Department of Mathematics. Elected student liaison to the graduate committee for academic year 2006-2007.

Undergraduate Committee GTA Representative University of Arizona, Department of Mathematics. Elected member of the undergraduate committee, academic years 2004-2006.

High School Workshop Leader University of Arizona, Department of Mathematics. I participated in the planning and presentation of workshops for high school students in probability and knot theory. Fall 2001, Spring 2002.

Teacher-Mentor Desert View High School, Tucson. As part of Career-Ladder program, I mentored a first year high school teacher.

Mathematics Curriculum Committee Member Sunnyside School District, Tucson. I served on the district's K-12 mathematics curriculum committee for two years.

Algebra Club Creighton Middle School, Phoenix. In cooperation with another teacher, I ran an after-school algebra program for middle school students. The program goal was to use manipulatives to introduce middle-school students to basic concepts in algebra.

Funded Professional Workshop Participation

Cohomological Methods in Abelian Varieties. American Institute of Mathematics. March 26-30, 2012.

Critical Issues in Education, MSRI. May 11-13, 2011.

Arithmetic Statistics, MSRI. January 27-28 and January 31-February 4, 2011.

Advanced Course on Arithmetic Geometry for Function Fields of Positive Characteristic, Centre de Recerca Matemàtica, Barcelona. February 22-March 5, 2010.

PCMI Arithmetic of L-Functions, Park City Utah. June 28-July18, 2009.

Women in Numbers, Banff International Research Station. November, 2008.

Critical Issues in Education, MSRI. May 14 - 16, 2008.

Arizona Winter School, Tucson, March 2008, 2007, 2006. Albuquerque, March 2005.

Clay Mathematics Institute Summer School in Arithmetic Geometry, Göttingen, 2006.

Algebraic Geometry Graduate Student Warm-up Workshop, Seattle, Summer 2005.

Undergraduate Honors and Awards

Paul Douglas Teachers Scholarship
- An academic scholarship to recruit highly qualified teachers.
- Fall 1988 through Spring 1992

Nugent Scholarship
- An academic scholarship awarded by the University of Arizona
- Fall 1988 through Spring 1992

Golden Key National Honor Society
Phi Eta Sigma Honor Society
University of Arizona Honors Program Participant

Other Educational Experiences

Centro Maya de Idiomas, Quetzaltenango, Guatemala.
- International Coordinator, September 1994-March 1995.
- Translated conferences and written materials.
- Coordinated English language instruction program in rural elementary school.
- Studied Spanish and Q'anjob'al languages

Centro Maya de Idiomas.
- Student, July 1994.
- Studied Spanish language and literature.