

Douglas Ulmer

Professor and Head
Department of Mathematics
University of Arizona
Tucson, AZ 85721

<http://math.arizona.edu/~ulmer>
<http://orcid.org/0000-0003-1529-4390>

Education

Brown University, Ph.D., Mathematics 1983 – 1987
– Thesis: “The Arithmetic of Universal Elliptic Modular Curves”
– Advisor: B. H. Gross
– Major Fields: Number Theory and Algebraic Geometry

Princeton University, A.B. *magna cum laude*, Mathematics 1978 – 1982

Employment

Professor and Department Head, University of Arizona 2017 –
Professor, Georgia Institute of Technology 2015 – 2017
Professor and School Chair, Georgia Institute of Technology 2009 – 2015
Assistant, Associate, Full Professor, University of Arizona 1991 – 2009
Bateman Research Instructor, California Institute of Technology 1989 – 1991
C.L.E. Moore Instructor, Massachusetts Institute of Technology 1987 – 1989

Invitations

Institut de Mathématiques de Jussieu, Paris May – June 2008
Institut des Hautes Etudes Scientifiques, Bures-sur-Yvette October 2007 – March 2008
Université de Paris-Sud, Orsay September 2007
Isaac Newton Institute, Cambridge July 2004
Institut des Hautes Etudes Scientifiques, Bures-sur-Yvette June – July 1998
Université Paul Sabatier, Toulouse April 1998
Universitat Politècnica de Catalunya, Barcelona March 1998
Max-Planck-Institut für Mathematik, Bonn August 1997 – February 1998
Institut Henri Poincaré, Paris June – July 1997
Universität Bielefeld August 1994
Mathematical Sciences Research Institute, Berkeley June 1993
Université de Paris-Sud, Orsay March – August 1992
Instituto de Matemática Pura e Aplicada, Rio de Janeiro February 1990

Research interests

Algebraic geometry and number theory. More specifically, the arithmetic and geometry of curves, surfaces, and abelian varieties over finite fields, number fields, and function fields; rational points and algebraic cycles; the conjectures of Birch and Swinnerton-Dyer and of Tate. Advocacy for mathematics research and education at all levels.

Refereed publications

Journal articles

1. On the number of rational points on special families of curves over function fields (with J. F. Voloch), *New Zealand Journal of Mathematics*, **47** (2017), 1–7.
2. Rational curves on elliptic surfaces, *Journal of Algebraic Geometry*, **26** (2017), 357–377.
3. Arithmetic of Jacobians in Artin-Schreier extensions (with R. Pries), *Transactions of the American Mathematical Society*, **368** (2016), 8553–8595.
4. Conductors of ℓ -adic representations, *Proceedings of the American Mathematical Society*, **144** (2016), 2291–2299.
5. Low-dimensional factors of superelliptic Jacobians (with T. Occhipinti), *European Journal of Mathematics*, **1** (2015), 279–285.
6. Explicit points on the Legendre curve III, *Algebra and Number Theory*, **8** (2014), 2471–2522.
7. Explicit points on the Legendre curve II (with Ricardo Conceição and Chris Hall), *Mathematical Research Letters*, **21** (2014), 261–280.
8. Explicit points on the Legendre curve, *Journal of Number Theory*, **136** (2014), 165–194.
9. On Mordell-Weil groups of Jacobians over function fields, *Journal of the Institute of Mathematics of Jussieu*, **12** (2013), 1–29.
10. Unboundedness of the number of rational points on curves over function fields (with Ricardo Conceição and Felipe Voloch), *New York Journal of Mathematics*, **18** (2012), 291–293.
11. Ranks of Jacobians in towers of function fields (with Yuri Zarhin), *Mathematical Research Letters*, **17** (2010), 637–645.
12. Jacobi sums, Fermat Jacobians, and ranks of abelian varieties over towers of function fields, *Mathematical Research Letters*, **14** (2007), 453–467.
13. L -functions with large analytic rank and abelian varieties with large algebraic rank over function fields, *Inventiones Mathematicae*, **167** (2007), 379–408.
14. Geometric non-vanishing, *Inventiones Mathematicae*, **159** (2005), 133–186.
15. Elliptic curves with large rank over function fields, *Annals of Mathematics*, **155** (2002), 295–315.
16. Slopes of modular forms and congruences, *Annales de L'Institut Fourier*, **46** (1996), 1–32. Corrigendum: same volume, p. 1519.
17. On the Fourier coefficients of modular forms II, *Mathematische Annalen* (2), **304** (1996), 363–422.
18. A construction of local points on elliptic curves over modular curves, *International Mathematical Research Notices*, No. 7 (1995), 349–363.
19. On the Fourier coefficients of modular forms, *Annales Scientifiques de l'Ecole Normale Supérieure* (4), **28** (1995), 129–160.
20. Curves of genus ten on K3 surfaces, (with Fernando Cukierman), *Compositio Mathematica*, **89** (1993), 81–90.

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21. p -descent in characteristic p , *Duke Mathematical Journal*, **62** (1991), 237–265.
22. L -functions of universal elliptic curves over Igusa curves, *American Journal of Mathematics*, **112** (1990), 687–712.
23. On universal elliptic curves over Igusa curves, *Inventiones Mathematicae*, **99** (1990), 377–391.

Book chapters

24. Curves and Jacobians over Function Fields, in *Arithmetic Geometry over Global Function Fields*, Advanced Courses in Mathematics CRM Barcelona, Springer Basel, (2014), 281–337.
25. Park City lectures on Elliptic curves over function fields, in *Arithmetic of L -functions*, IAS/Park City Mathematics Series **18** (2011), 211–280.
26. Function fields and random matrices, in *Ranks of elliptic curves and random matrix theory*, London Mathematical Society Lecture Note Series, **341** (2007), 109–142.
27. Elliptic curves and analogies between number fields and function fields, in *Heegner Points and Rankin L -series*, MSRI Publications **49** (2004), 285–315.

Conference proceedings

28. On balanced subgroups of the multiplicative group (with Carl Pomerance), in “*Number Theory and Related Fields In Memory of Alf van der Poorten*”, (Springer Proceedings in Mathematics & Statistics **43**), (2013), 253–270.
29. Slopes of modular forms, *Contemporary Mathematics*, **174** (1994), 167–183.

Work in progress

In press

30. Explicit arithmetic of Jacobians of generalized Legendre curves over global function fields (with L. Berger, C. Hall, R. Pannekoek, J. Park, R. Pries, S. Sharif, and A. Silverberg), vi+121 pages, [arxiv:1505.00021](https://arxiv.org/abs/1505.00021). To appear in the *Memoirs of the American Mathematical Society*.

Research grants

| | | |
|--|-----------|-------------|
| GT College of Sciences Faculty Development Grant, Principal Investigator | \$10,000 | 2016 – 2017 |
| Simons Collaboration Grant 359573, Principal Investigator | \$35,000 | 2015 – 2020 |
| NSF Grant DMS 0701053, Principal Investigator | \$120,000 | 2007 – 2010 |
| NSF Grant DMS 0400877, Principal Investigator | \$126,000 | 2004 – 2007 |
| NSF Grant DMS 0070839, Principal Investigator | \$60,000 | 2000 – 2002 |
| NSF Grant DMS 9700871, Principal Investigator | \$75,000 | 1997 – 2000 |
| NSF Grant DMS 9302976, Co-Principal Investigator | \$62,214 | 1993 – 1996 |
| NSF Grant DMS 9114816, Principal Investigator | \$38,932 | 1991 – 1993 |
| NSF Grant DMS 8905251, Postdoctoral Associate | \$31,694 | 1989 – 1991 |
| NSF Grant DMS 8801743, Postdoctoral Associate | \$28,029 | 1988 – 1989 |
| Sloan Foundation Doctoral Dissertation Fellowship | \$15,000 | 1986 – 1987 |

Conference and travel grants

NSF conference grant DMS 0968709: \$19,600, 2009. University of Arizona Foreign Travel grants: \$800, 2003; \$750, 2002; \$500, 1996; \$500, 1995; \$650, 1992. Bourse du Gouvernement Français: FF60,000, 1992. NSF International Travel grant to Kyoto ICM: \$1,000, 1990.

Training and infrastructure grants

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|--|-------------|-------------|
| NSF MCTP training grant DMS 1344199 co-Principal Investigator with 3 co-PIs | \$1,300,000 | 2014 – 2019 |
| NSF S-STEM graduate scholarship grant DUE 1060333 co-Principal Investigator with 4 co-PIs | \$600,000 | 2011 – 2016 |
| NSF S-STEM graduate scholarship grant DUE 0728684 Principal Investigator with 1 co-PI | \$552,000 | 2007 – 2011 |
| NSF VIGRE training grant DMS 0602173 Principal Investigator with 4 co-PIs | \$3,500,000 | 2006 – 2011 |
| NSF Infrastructure Grant DMS 0207478 Principal Investigator with 9 co-PIs | \$544,380 | 2002 – 2005 |
| NSF Group Infrastructure Grant DMS 9709662 Principal Investigator with 6 co-PIs | \$500,000 | 1997 – 2002 |

Scholarly presentations

Lecture courses

| | |
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| “Curves and Jacobians over Function Fields” (Series of 12 lectures at the Centre de Recerca Matemàtica, Barcelona, Spain) | February 2010 |
| “Elliptic Curves over Function Fields” (Series of five lectures at the IAS-Park City Math Institute, Park City, Utah) | July 2009 |
| “Elliptic curves over Function Fields and a Gross-Zagier Theorem” (Series of four lectures and student project at the Arizona Winter School, Tucson) | March 2000 |
| “Elliptic Curves, Automorphic Forms, and Gross-Zagier Theorems over Function Fields” (Series of three lectures for joint seminar of Barcelona Universities) | April 1998 |
| “Drinfeld’s Construction of Automorphic Forms” (Lecture series and working group organization, Max-Planck-Institut für Mathematik) | December 1997 |
| “ p -descent in Characteristic p ” (Series of three lectures at the Instituto de Matemática Pura e Aplicada, Rio de Janeiro) | February 1990 |

Conference Lectures

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|---|----------------|
| AMS Special Session on Numbers, Functions, Transcendence, and Geometry University of North Texas at Denton | September 2017 |
| Journées Arithmétiques Caen, France | July 2017 |
| Arbeitsgemeinschaft on Higher Gross Zagier Formulas Mathematisches Forschungsinstitut Oberwolfach | April 2017 |
| 20th Anniversary ALGA—Algebra Comutativa e Geometria Algébrica Instituto de Matemática Pura e Aplicada, Rio de Janeiro | February 2017 |

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| International Conference on Number Theory African Institute of Mathematical Sciences and University of Stellenbosch | January 2017 |
| American Mathematical Society Special Session on Elliptic Curves University of Georgia, Athens | March 2016 |
| American Mathematical Society Special Session on Higher Genus Curves and Fibrations of Higher Genus Curves in Mathematical Physics and Arithmetic Geometry, Seattle | January 2016 |
| American Mathematical Society Summer Institute on Algebraic Geometry University of Utah, Salt Lake City | July 2015 |
| Explicit Methods in Number Theory Mathematisches Forschungsinstitut Oberwolfach | July 2015 |
| Escola de Álgebra XXIII Universidade Estadual de Maringá, Brazil | July 2014 |
| Explicit Methods in Number Theory Mathematisches Forschungsinstitut Oberwolfach | July 2013 |
| Journées Arithmétiques Grenoble, France | June 2013 |
| Conference on Arithmetic Geometry Stellenbosch University, South Africa | January 2013 |
| Penn State–Göttingen Number Theory Conference (two lectures) Göttingen, Germany | August 2012 |
| Workshop on Cohomological Methods in Abelian Varieties American Institute of Mathematics, Palo Alto | March 2012 |
| American Mathematical Society Special Session on Arithmetic Geometry Boston | January 2012 |
| XXII ^{ème} Rencontres Arithmétiques de Caen Université de Caen | June 2011 |
| Workshop on the Arithmetic of Function Fields Imperial College, London | June 2011 |
| Exponential sums over Finite Fields and Applications Forschungsinstitut für Mathematik, ETH, Zurich | November 2010 |
| Number Theory and Representation Theory in Honor of Dick Gross Harvard University, Cambridge | June 2010 |
| Sage Days 21: Function Fields University of Washington, Seattle | May 2010 |
| American Mathematical Society Special Session on Arithmetic of Function Fields San Francisco | January 2010 |
| American Mathematical Society Special Session on Function Fields and their Applications Pennsylvania State University, University Park | October 2009 |
| Random matrices, L -functions and Primes Forschungsinstitut für Mathematik, ETH, Zurich | October 2008 |
| Workshop on the Tate Conjecture American Institute of Mathematics, Palo Alto | July 2007 |
| American Mathematical Society Special Session on Arithmetic Algebraic Geometry Warsaw | July 2007 |
| American Mathematical Society Special Session on Arithmetic of Function Fields New Orleans | January 2007 |
| School and Conference on Number Theory and Random Matrix Theory University of Rochester | June 2006 |

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| Canadian Mathematical Society Conference on Random Matrix Theory and L -functions University of Waterloo, Ontario | June 2005 |
| American Mathematical Society Special Session on Arithmetical Algebraic Geometry University of New Mexico, Albuquerque | June 2005 |
| London Mathematical Society Symposium on L -functions and Galois Representations University of Durham, UK | July 2004 |
| Conference on Matrix Ensembles and L -Functions Isaac Newton Institute, Cambridge | June 2004 |
| Conference on Random Matrix Theory and the Birch and Swinnerton-Dyer Conjecture Isaac Newton Institute, Cambridge | February 2004 |
| International Conference on the Birch and Swinnerton-Dyer Conjecture Princeton University | October 2003 |
| American Mathematical Society Special Session on Arithmetical Algebraic Geometry Northeastern University | October 2002 |
| Brazilian Summer School on Algebra Cabo Frio, Rio de Janeiro | July 2002 |
| Conference on Heegner Points and Rankin L -series Mathematical Sciences Research Institute, Berkeley | December 2001 |
| NSF-CBMS Regional Conference on Modular Elliptic Curves University of Central Florida, Orlando | August 2001 |
| Workshop on Random Matrices and L -functions American Institute of Mathematics, Palo Alto | May 2001 |
| American Mathematical Society Special Session on Number Theory with a Geometric Flavor University of Nevada at Las Vegas | April 2001 |
| American Mathematical Society Special Session on Results from the Arizona Winter School New Orleans | January 2001 |
| American Mathematical Society Special Session on Analytic Number Theory New Orleans | January 2001 |
| Millennial Conference on Number Theory University of Illinois at Urbana-Champaign | May 2000 |
| American Mathematical Society Special Session on Number Theory University of Nevada at Las Vegas | April 1999 |
| American Mathematical Society Special Session on Number Theory University of Illinois at Chicago | September 1998 |
| International Conference on L -functions and p -adic Methods Institut Henri Poincaré, Paris | June 1997 |
| American Mathematical Society Special Session on Automorphic Forms Rider University | October 1996 |
| Workshop on Drinfeld Modules, Modular Schemes, and Applications Alden Biesen, Belgium | September 1996 |
| Conference on the Arithmetic of Function Fields Brown University | April 1996 |
| Journées Arithmétiques 1995 Barcelona | July 1995 |
| American Mathematical Society Special Session on Arithmetic Algebraic Geometry University of Illinois at Chicago | March 1995 |
| Conference on Arithmetic Geometry with an Emphasis on Iwasawa Theory Arizona State University | March 1993 |

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| Workshop on Hodge Theory and Crystalline Cohomology University of California at Berkeley | March 1993 |
| Arbeitsgemeinschaft on Logarithmic Algebraic Geometry Mathematisches Forschungsinstitut Oberwolfach | October 1992 |
| American Mathematical Society Special Session on Algebraic Geometry University of North Texas at Denton | November 1990 |
| American Mathematical Society Special Session on Arithmetic Geometry University of Massachusetts at Worcester | April 1989 |

Colloquia

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|---|----------------|
| University of Canterbury | November 2016 |
| Colorado State University | February 2016 |
| Center for Communications Research Princeton | December 2015 |
| Xi'an Jiaotong University | July 2015 |
| Shanghai Jiaotong University | July 2015 |
| Center for Communications Research La Jolla | May 2015 |
| Universidad de Buenos Aires | July 2014 |
| University of Maryland, College Park, Maryland | November 2013 |
| Guangzhou University, Guangzhou China | May 2013 |
| Florida State University, Tallahassee, Florida | November 2012 |
| Dartmouth College, Hannover, New Hampshire | October 2011 |
| Georgia Southern University, Statesboro, Georgia | May 2011 |
| Clemson University, Clemson, South Carolina | April 2010 |
| Georgia Institute of Technology, Atlanta, Georgia | February 2008 |
| Adam Mickiewicz University, Poznan, Poland | October 2007 |
| Front Range Number Theory Colloquium, Colorado State University | February 2006 |
| University of Texas at Austin | October 2005 |
| University of Arizona | September 1999 |
| University of California at Irvine | April 1996 |

Seminars (local seminars omitted)

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| Colorado State University Number Theory Seminar | September 2016 |
| Princeton University/IAS Number Theory Seminar | May 2016 |
| Pennsylvania State University Number Theory Seminar | January 2016 |
| University of Rochester Number Theory Seminar | November 2015 |
| University of Michigan Algebraic Geometry Seminar | September 2015 |
| Shanghai Jiaotong University Number Theory Seminar | July 2015 |
| University of Colorado at Boulder Number Theory Seminar | December 2014 |
| University of Texas at Austin Number Theory Seminar | November 2014 |
| Universidad de Buenos Aires Algebraic Geometry Seminar | July 2014 |
| Colorado State University Number Theory Seminar | April 2014 |
| University of Maryland Number Theory Seminar | November 2013 |
| Jilin University Student Seminar | May 2013 |
| University of Arizona Algebra and Number Theory Seminar | March 2013 |
| Dartmouth College Number Theory Seminar | October 2011 |
| University of Arizona Algebra and Number Theory Seminar | April 2010 |

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| Brown Number Theory Seminar | March 2010 |
| Emory/UGA/GA Tech joint Number Theory Seminar | October 2009 |
| Penn State Number Theory Seminar | February 2009 |
| University of Texas at Austin Number Theory Seminar | October 2008 |
| London Number Theory Seminar at King's College London | June 2008 |
| Séminaire de Théorie des Nombres, Institut Fourier, Grenoble | May 2008 |
| Séminaire de Théorie des Nombres, Université de Paris-Nord | April 2008 |
| Séminaire de Théorie des Nombres de Chevaleret, Paris | April 2008 |
| University of Arizona Algebra and Number Theory Seminar | March 2008 |
| Number Theory Seminar, Max-Planck-Institut für Mathematik, Bonn | February 2008 |
| Poznan University Number Theory Seminar | October 2007 |
| Séminaire d'Arithmétique et de Géométrie Algébrique, Université de Paris-Sud | October 2007 |
| Oxford University Number Theory Seminar | July 2006 |
| King's College London Number Theory Seminar | July 2006 |
| Cambridge University Number Theory Seminar | July 2006 |
| Séminaire de Théorie des Nombres de Bordeaux | June 2006 |
| Séminaire de Théorie des Nombres de Chevaleret, Paris | June 2006 |
| Barcelona Tri-University Number Theory Seminar (two lectures) | June 2006 |
| Five Colleges Number Theory Seminar, Amherst | April 2006 |
| University of Michigan at Ann Arbor Arithmetic Geometry Seminar | February 2006 |
| University of Wisconsin at Madison Number Theory Seminar | November 2005 |
| Southern California Number Theory Day | October 2005 |
| University of Texas at Austin Number Theory Seminar | October 2005 |
| Stanford University Number Theory Seminar | April 2004 |
| CUNY Graduate Center Number Theory Seminar | November 2002 |
| Université Paul Sabatier, Toulouse Number Theory Seminar | June 2002 |
| University of Chicago Algebraic Geometry Seminar | October 2001 |
| University of Michigan at Ann Arbor Algebraic Geometry Seminar | October 2001 |
| University of Maryland at College Park Number Theory Seminar | May 2001 |
| California Institute of Technology Number Theory Seminar | October 2000 |
| Arizona State University Number Theory Seminar | February 1999 |
| Université Paul Sabatier, Toulouse Number Theory Seminar | May 1998 |
| Université Louis Pasteur, Strasbourg Arithmetical Algebraic Geometry Seminar | February 1998 |
| Université de Paris-Sud Arithmetical Algebraic Geometry Seminar | January 1998 |
| Katholieke Universiteit Leuven Number Theory Seminar | October 1997 |
| Max-Planck-Institut für Mathematik Number Theory Seminar | September 1997 |
| Université de Rennes Algebraic Geometry Seminar | July 1997 |
| Montreal Number Theory Seminar, Concordia University | October 1996 |
| Five Colleges Number Theory Seminar, Amherst, MA | October 1996 |
| University of Southern California Number Theory Seminar | April 1996 |
| Universität Bielefeld Number Theory Seminar (two lectures) | August 1994 |
| Columbia University Number Theory Seminar | April 1994 |
| California Institute of Technology Number Theory Seminar | March 1994 |
| University of Texas at Austin Number Theory Seminar | February 1994 |
| Boston University Number Theory Seminar | May 1993 |
| University of Minnesota Algebraic Geometry Seminar | April 1993 |
| Università di Torino Algebraic Geometry Seminar (two lectures) | May 1992 |
| Université de Rennes Number Theory Seminar | April 1992 |

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| Université de Paris-Sud Algebraic Geometry Seminar | April 1992 |
| Johns Hopkins University Algebraic Geometry Seminar | February 1992 |
| University of California at Berkeley Number Theory Seminar | November 1991 |
| Arizona State University Number Theory Seminar | October 1991 |
| University of California at Riverside Algebraic Geometry Seminar | April 1991 |
| Los Angeles Area Number Theory Seminar | February 1991 |
| Yau Seminar at The California Institute of Technology | December 1990 |
| Stanford University Number Theory Seminar | October 1990 |
| University of California at Berkeley Number Theory Seminar | August 1990 |
| Boston University Number Theory Seminar | October 1988 |
| Harvard University Number Theory Seminar | December 1987 |
| Harvard University Number Theory Seminar | November 1987 |

Teaching and mentoring

I have taught a variety of courses, from freshman calculus through advanced graduate courses. I have also sponsored many capstone and undergraduate research projects, reading courses, and other one-on-one work with students. My teaching has been recognized at Georgia Tech with several “Thank a Teacher” certificates and mentions on the list of “Most Influential Professors” and at the University of Arizona by the Eller College of Business and Public Administration *Student Council Faculty Award* in 1999.

Graduate students and postdocs

PhD students

| | | |
|---------------------|--|------|
| Tommy Occhipinti | First position: 3-year post-doc, UC Irvine | 2010 |
| Lisa Berger | First position: Tenure-track assistant professor, Stony Brook University | 2007 |
| Geoffrey Cunningham | First position: Cryptologic mathematician, National Security Agency | 2000 |

Master’s students

| | |
|-------------------|------|
| Boonyarit Intiyot | 2001 |
| Paul Baloun | 2000 |

Post-docs mentored

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| Padmavathi Srinivasan | 2016 – 2017 |
| Kit Ho Mak | 2012 – 2014 |
| Saikat Biswas | 2011 – 2013 |
| Cetin Urtis | 2002 – 2005 |
| Mugurel Barcau | 2001 – 2004 |
| Shuzo Takahashi | 2000 – 2004 |
| Dennis Eichhorn | 2001 – 2003 |
| Carl Lienert | 1998 – 2000 |
| Antonios Broumas | 1998 – 2000 |

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Academic committees

Thesis committees

(All local unless indicated otherwise.) Richard Griffon (Paris 7), Cecilia Salgado (Paris 7), Florent Jouve (Bordeaux 1), Fred Leitner, Selin Kalaycioglu, Virgil Pierce, Chris Rasmussen, Sarah Hoffman, Alexander Perlis, Susan Hammond, David Marshall, Aaron Ekstrom, Fahd Al Shammari, Cheryl Delorme

Oral exam committees

Hyunshik Shin, Jordan Schettler, Cameron McLeman, Pani Konstantinou, Robert Pawloski, Junnyeong Jang, Adam Speigler, Erin McNicholas, Derek Habermas, Fred Leitner, Aaron Wooton, Chris Rasmussen, Jeff Selden, Sarah Hoffman, Maria Agrotis, Fahd Al Shammari, Alexander Perlis, Mark Keisling, Mohammed El Hadrami.

Comprehensive exams

Author and grader of over 100 written comprehensive or qualifying examinations in Algebra, Geometry, and Topology in at least 13 semesters.

Course development

| | | |
|------------|--|--|
| Math 2561 | Honors Multivariable Calculus | Initiated in Spring 2016 |
| Math 1564 | Linear Algebra with Abstract Vector Spaces | Initiated in Fall 2015 |
| Math 445 | Introduction to Cryptography | Initiated in Spring 2004 |
| Math 128AB | Mathematics for Business Decisions | First mainstream offering in 1999 – 2000 |
| Math 536 | Algebraic Geometry | Initiated in Fall 1992 |

Lecture courses

At the Georgia Institute of Technology

| | | |
|-----------|--|-------------|
| Math 2561 | Honors Multivariable Calculus | Spring 2016 |
| Math 1564 | Linear Algebra with Abstract Vector Spaces | Fall 2015 |
| Math 6421 | Algebraic Geometry I | Fall 2013 |
| Math 1512 | Honors Calculus II | Fall 2012 |
| Math 6121 | Algebra I | Fall 2011 |
| Math 2406 | Abstract Vector Spaces | Fall 2010 |

At the University of Arizona

| | | |
|--------------|---|-------------|
| Math 536B | Algebraic Geometry | Spring 2009 |
| Math 536A | Algebraic Geometry | Fall 2008 |
| Math 519 | Topics in Arithmetical Algebraic Geometry | Spring 2007 |
| Math 443/543 | Theory of Graphs and Networks | Fall 2006 |
| Math 520B | Complex Analysis (Riemann surfaces) | Spring 2006 |
| Math 520A | Complex Analysis | Fall 2005 |
| Math 536B | Algebraic Geometry | Spring 2005 |
| Math 445 | Introduction to Cryptography | Spring 2004 |
| Math 559B | Lie Groups and Lie Algebras | Spring 2003 |

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|--------------|---|-------------|
| Math 160 | Basic Statistics | Fall 2002 |
| Math 559A | Lie Groups and Lie Algebras | Fall 2002 |
| Math 125 | Calculus I | Fall 2001 |
| Math 531 | Algebraic Topology | Fall 2001 |
| Math 536B | Algebraic Geometry | Spring 2001 |
| Math 115B | Mathematics for Business Decisions II | Fall 2000 |
| Math 129 | Calculus II (honors) | Fall 2000 |
| Math 128B | Mathematics for Business Decisions II | Spring 2000 |
| Math 534B | Topology-Geometry | Spring 2000 |
| Math 128A | Mathematics for Business Decisions I | Fall 1999 |
| Math 534A | Topology-Geometry | Fall 1999 |
| Math 519 | Topics in Number Theory (Modular Forms) | Spring 1999 |
| Math 122 | Math in Modern Society | Fall 1998 |
| Math 254 | Introduction to Ordinary Differential Equations | Fall 1998 |
| Math 534B | Topology-Geometry | Spring 1997 |
| Math 254 | Introduction to Ordinary Differential Equations | Fall 1996 |
| Math 534A | Topology-Geometry | Fall 1996 |
| Math 410 | Matrix Analysis | Summer 1996 |
| Math 514B | Algebraic Number Theory | Spring 1996 |
| Math 215 | Linear Algebra | Fall 1995 |
| Math 514A | Algebraic Number Theory | Fall 1995 |
| Math 223 | Vector Calculus (two sections) | Fall 1994 |
| Math 416/516 | Second Course in Abstract Algebra | Spring 1994 |
| Math 125B | Calculus II | Fall 1993 |
| Math 415/515 | Abstract Algebra | Fall 1993 |
| Math 536B | Algebraic Geometry | Spring 1993 |
| Math 125A | Calculus I | Fall 1992 |
| Math 538 | Topics in Geometry and Topology | Fall 1992 |
| Math 125A | Calculus I | Fall 1991 |
| Math 511A | Algebra | Fall 1991 |

At the California Institute of Technology

| | | |
|-----------|-----------------------------------|-------------|
| Math 151c | Topology and Geometry | Spring 1991 |
| Math 160a | Number Theory | Winter 1990 |
| Math 104 | Introduction to Complex Variables | Winter 1990 |
| Math 120c | Abstract Algebra | Spring 1990 |
| Math 191e | Algebraic Curves | Winter 1989 |
| Math 91a | Projective Geometry | Fall 1989 |

At the Massachusetts Institute of Technology

| | | |
|--------|---|-------------|
| 18.776 | Algebraic Number Theory (Cyclotomic Fields) | Spring 1989 |
| 18.02 | Calculus (Integrated Studies Program recitation) | Spring 1989 |
| 18.01 | Calculus (Integrated Studies Program recitation) | Fall 1988 |
| 18.02 | Calculus (One ISP recitation and one standard recitation) | Spring 1988 |
| 18.02 | Calculus (Recitation) | Fall 1987 |
| 18.013 | Applied Calculus (Recitation) | Fall 1987 |

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Reading courses and independent studies

Graduate level

Twenty-six student-semesters of independent study or reading courses with the following graduate students: Chris Pryby, Enrique Acosta, Martin Leslie, Chris Jewel, Daniel Bartlett, Fred Leitner, Chris Rasmussen, David Marshall, Susan Hammond, Cheryl Delorme, Aaron Ekstrom, Warren Staley, Fahd Al Shammari, Javier Diaz-Vargas, Mohammed El Hadrami, Stephen Shipman, and Barbara Shipman.

Undergraduate level

Twenty-seven student-semesters of undergraduate research, independent study, and capstone projects with the following undergraduate students: Shuangcai Zhang, Michael Lane, Sam Kim, Mahadi Osman, Zack Wilt, David Turk, David Hollis, Ryan Carlin, Harrison Brown, Ivan Barrientos, Mathew Green, Maria Francis-Moullier, Justin Miller, Karen Carter, Charlie Chi, and Boonyarit Intiyot.

Extramural service

Editorial

Editorial board, *Journal de Théorie des Nombres de Bordeaux* 2014 –
Twenty-one reviews for *Mathematical Reviews* 1992 – 2004
At least 76 reviews of articles and books for the following journals and publishers: *Acta Arithmetica*, *Algebra and Number Theory*, *Annales de L'Institut Fourier*, *Annals of Mathematics*, *Archiv der Mathematik*, *Boletín de la Sociedad Matemática Mexicana*, *Bulletin de la Société Mathématique de France*, *Canadian Journal of Mathematics*, *Central European Journal of Mathematics*, *Commentarii Mathematici Helvetici*, *Compositio Mathematica*, *Duke Mathematical Journal*, *Indiana University Mathematical Journal*, *International Journal of Number Theory*, *International Mathematical Research Notices*, *Inventiones Mathematicae*, *Israel Journal of Mathematics*, *Journal of the Mathematical Society of Japan*, *Journal für die reine und angewandte Mathematik*, *Journal of Algebra*, *Journal of Number Theory*, *Kodai Mathematical Journal*, *London Mathematical Society Journal of Computation and Mathematics*, *Manuscripta Mathematica*, *Mathematical Research Letters*, *Mathematische Annalen*, *Mathematische Zeitschrift*, *Publications of the Mathematical Sciences Research Institute*, *Rendiconti Lincei Matematica e Applicazioni*, Springer, *Transactions of the American Mathematical Society* 1991 –

Organizational

Co-organizer of an NSF advisory workshop on “Networks” April 2009
Scientific organizer of an American Mathematical Society Special Session in Tucson April 2007
Organizer of the VIGRE Southwestern Network 2006 – 2009
Scientific organizer of an American Mathematical Society Special Session in Pisa June 2002
Director of the Southwestern Center for Arithmetical Algebraic Geometry 1997 – 2006
Leader of a workshop for teachers of Multivariable Calculus using Calculus Consortium April 1996
Materials, California Polytechnic State University, Pomona

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Advisory boards and panels

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| Chinese Ministry of Education evaluation of Xi'an Jiaotong University | May 2017 |
| External review committee for University of Georgia NSF-funded AGANT project | November 2016 |
| MSRI/CIME Panel on Observing and Evaluating Teaching | February 2016 |
| National Science Foundation panel on Arithmetic Geometry | January 2015 |
| Executive committee, MSRI Committee of Academic Sponsors | 2014 – 2017 |
| NSF site visit team to review MSRI (chair) | September 2014 |
| University of North Carolina Charlotte Department of Mathematics Program Review | April 2014 |
| University System of Georgia Task Force on College Completion | 2012 – 2013 |
| National Science Foundation Committee of Visitors area chair (declined) | February 2010 |
| NSF panel on the Mathematical Sciences Postdoctoral Research Fellowship | December 2009 |
| NSF panel on the Mathematical Sciences Postdoctoral Research Fellowship | December 2008 |
| National Science Foundation panel on Number Theory | November 2007 |
| National Science Foundation-sponsored Panel Discussion on VIGRE (New Orleans) | January 2007 |
| National Science Foundation panel on Arithmetic Geometry | January 2006 |
| National Science Foundation panel on VIGRE grants | August 2006 |
| National Science Foundation panel on Arithmetic Geometry | January 2005 |
| American Mathematical Society Committee on Education Panel on VIGRE | October 2004 |
| AMS/MAA/SIAM Panel on “Big Mathematics” at Dialog 2004 | May 2004 |
| National Science Foundation panel on POWRE grants (Professional Opportunities for Women in Research and Education) | August 1997 |

Reports to universities

Clemson University, Colorado State University, Grinnell College, Emory University, Nanyang Technological University of Singapore, National University of Singapore, Penn State University, Queens University, Rice University, Seoul National University, Stony Brook University, University of Amsterdam, University of Canterbury, University of Maryland at College Park, University of Massachusetts at Amherst, University of Michigan, University of Wyoming.

Reports to funding agencies and research institutes

Fulbright Commission, Institute for Mathematics and its Applications, National Academy of Sciences, National Science Foundation (at least 34 mail reviews of proposals), National Security Agency (at least 9 recent mail reviews), Netherlands Organisation for Scientific Research (NWO).

University service

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| Stamps Presidential Scholars finalist interviews | March 2017 |
| Fulbright Fellowship faculty interview panel | September 2016 |
| Georgia Tech High School Mathematics Competition | March 2016 |
| Georgia Tech Career, Research, and Innovation Development Conference judging | March 2016 |
| Georgia Tech Focus Group on Space and Scheduling | January 2016 |
| Georgia Tech High School Mathematics Competition | February 2015 |
| Georgia Tech Research and Innovation Conference judging | March 2014 |
| Presidential Scholarship interviews | March 2014 |
| Georgia Tech High School Mathematics Competition | February 2014 |
| Inventure Prize judging | January 2014 |
| ADVANCE Chairs Workshop panelist | April 2013 |

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| Georgia Tech High School Mathematics Competition | March 2013 |
| Inventure Prize judging | January 2013 |
| Presidential Scholarship interviews | March 2012 |
| Inventure Prize judging | January 2012 |
| Georgia Tech High School Mathematics Competition | February 2011 |
| School of Computer Science Chair Search Committee | 2010 – 2011 |
| Leadership Roundtable Retreat | October 2010 |
| Panelist at new faculty orientation | August 2010 |
| Graduate recruiting mission to Guanajuato and Mexico City | November 2006 |
| Fulbright Scholarship Selection Committee | October 2006 |
| Marshall Scholarship interviews | October 2006 |
| Finalist for the position of Dean of the Graduate College | December 2005 |
| Fulbright Scholarship Selection Committee | September 2005 |
| Graduate College recruiting trips to SACNAS, AMUC | Fall 2005 |
| Core Mathematics Task Force initiative | Spring 2004 |
| “What is Beauty?” Public lecture sponsored by <i>UA Presents</i> and the School of Music and Dance | October 2003 |
| Fulbright Scholarship Selection Committee | September 2003 |
| Goldwater Fellowship Committee | February 2001 |
| “Fermat’s Last Theorem,” Public Lecture, University of Arizona | August 1993 |

Departmental service

Major roles and initiatives

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|---|-------------|
| Donor agreements for two endowed chairs | Spring 2015 |
| School of Mathematics staff reorganization | Spring 2014 |
| Jack Hale post-doctoral program | 2013 – 2015 |
| Joint Institute and Visiting Honors Student Program with Jilin University | 2012 – 2015 |
| Significant lower-division curriculum revamp | 2012 – 2015 |
| Establishment of the Friends of the School of Mathematics (FoSoM) | 2010 – 2015 |
| Major space renovations to the Skiles building | 2009 – 2011 |
| Daniel Bartlett Memorial Lecture | 2006 – 2009 |
| Director of VIGRE program | 2004 – 2009 |
| Associate Head for the Graduate Program and Chair of the Graduate Committee | 2003 – 2009 |
| Director of the Southwestern Center for Arithmetical Algebraic Geometry (sponsor of the Arizona Winter School) | 1997 – 2006 |

Committees

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|--|-------------|
| Head Search Committee | 2008 – 2009 |
| Promotion and Tenure Committee (chair) | 2003 – 2005 |
| Peer Review Committee | 2001 – 2002 |
| Personnel Committee | 2000 – 2002 |
| Graduate Committee | 2000 – 2002 |
| Head Search Committee | 2000 – 2001 |
| Ad Hoc Committee on Salaries | 1999 – 2000 |

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| Promotion and Tenure Committee | 1998 – 2000 |
| Personnel Committee | 1998 – 1999 |
| Planning Committee | 1996 – 1997 |
| Personnel Committee | 1996 – 1997 |
| Computer Committee | 1995 – 1996 |
| Ad Hoc Committee on the Arizona Center for the Mathematical Sciences | 1995 – 1996 |
| Undergraduate Committee | 1994 – 1996 |
| Graduate Committees | 1992 – 1995 |
| Personnel Committee | 1992 – 1994 |
| Ad Hoc Committee on the Future of the Graduate Program | 1992 – 1993 |
| Ad Hoc Space Committee on Reconfiguring the Departmental Library | 1991 – 1992 |