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Professional Preparation

University of Georgia	NSF Postdoc, 2010–2011
McGill University	CRM–ISM/NSF Postdoc, 2008–2010
Columbia University	Mathematics, PhD, 2008
University of Georgia	Mathematics, MA, 2003
Pennsylvania State University	Mathematics, BS, 2001

Appointments

Assistant Professor of Mathematics	University of Hawaii	2011 – present
NSF Postdoctoral Research Fellow	University of Georgia	2010 – 2011
CRM–ISM/NSF Postdoctoral Research Fellow	McGill University	2008–2010

Publications (available at arXiv.org)

- (1) “Topology and Geometry of the Berkovich Ramification Locus, II.” (22 pages)
To appear in *Mathematische Annalen*.
- (2) “Rational Functions with a Unique Critical Point.” (13 pages)
To appear in *International Mathematics Research Notices*.
- (3) “Prime Factors of Dynamical Sequences,” with Andrew Granville. (26 pages)
Journal für die reine und angewandte Mathematik. **661** (2011), 189–214.
- (4) “On the Number of Rational Iterated Pre-Images of the Origin Under Quadratic Dynamical Systems,” with Benjamin Hutz and Michael Stoll. *International Journal of Number Theory*. **7** (2011), 1781–1806.
- (5) “Metric Properties of the Tropical Abel-Jacobi Map,” with Matthew Baker. *Journal of Algebraic Combinatorics*. **33** (2011), no. 3, 349–381.
- (6) “On the Number of Places of Convergence of Newton’s Method over Number Fields,” with José Felipe Voloch. *Journal de Théorie des Nombres de Bordeaux*. **23** (2011), 387–401.
- (7) *Automorphic Representations and L-Functions for the General Linear Group*, by Dorian Goldfeld and Joseph Hundley, Cambridge Studies in Advanced Mathematics, **129**, 2011. With over 250 exercises by Xander Faber.
- (8) “A Remark on the Effective Mordell Conjecture and Rational Pre-Images Under Quadratic Dynamical Systems.” *Comptes Rendus Mathématique. Académie des Sciences. Paris, Series I*. **348** (2010), 355–358.
- (9) “Equidistribution of Dynamically Small Subvarieties Over the Function Field of a Curve.” *Acta Arithmetica*. **137** (2009), 345–389.
- (10) “The Geometric Bogomolov Conjecture for Curves of Small Genus.” *Experimental Mathematics*. **18** (2009), no. 3, 347–367.

- (11) “Uniform Bounds on Pre-Images under Quadratic Dynamical Systems,” with Benjamin Hutz, Patrick Ingram, Rafe Jones, Michelle Manes, Thomas J. Tucker, and Michael E. Zieve. *Mathematical Research Letters*. **16** (2009), no. 1, 87–101.
- (12) “On the Finite Field Kakeya Problem in Two Dimensions.” *Journal of Number Theory*. **124** (2007), 248–257.
- (13) “Spectral Convergence of the Discrete Laplacian on Models of a Metrized Graph.” *New York Journal of Mathematics* **12** (2006), 97–121.
- (14) “Metrized Graphs, Laplacian Operators, and Electrical Networks,” with Matthew Baker. Quantum Graphs and their Applications, Contemporary Mathematics, *American Mathematical Society, Providence, RI*. **415** (2006) 15–33.
- (15) “Upper Bounds for Ropelength as a Function of Crossing Number,” with Jason Cantarella and Chad A. Mullikin. *Topology and its Applications* **135** (2003), no. 1-3, 253–264.

Preprints (most available at arXiv.org)

- (1) “Computation of preperiodic structures for quadratic polynomials over number fields,” with John R. Doyle and David Krumm. (11 pages) Submitted.
- (2) “Computing Automorphism Groups of Rational Functions,” with Michelle Manes and Bianca Viray. (16 pages) Submitted.
- (3) “Finite p -Irregular Subgroups of $\mathrm{PGL}_2(k)$.” (29 pages) Submitted.
- (4) “Topology and Geometry of the Berkovich Ramification Locus, I.” (34 pages) Submitted.

Professional Activities

- (1) **Conference Organization:**
 - (a) Co-organizer of the workshop on Global Arithmetic Dynamics at the Institute for Computational and Experimental Research in Mathematics (March 2012, Providence, RI)
 - (b) Head organizer of the Hawai’i Conference in Algebraic Number Theory, Arithmetic Geometry, and Modular Forms. Supported by an NSF Algebra and Number Theory Conferences grant for \$18,850 for which I was the PI. 90+ participants, 50+ speakers.
 - (c) Co-organizer of an AMS Special Session on Arithmetic Geometry at the Western Section Meeting (March 2012, Honolulu, HI)
 - (d) Organized and ran the 2011 Bellairs Workshop in Number Theory (Barbados) on “Tropical and Non-Archimedean Geometry,” with principal speaker Matthew Baker and 31 other participants from 9 countries
 - (e) Organized and ran the 2010 Bellairs Workshop in Number Theory (Barbados) on “Moduli Spaces in Arithmetic Dynamics,” with principal speaker Joseph Silverman and 25 other participants from 4 countries
- (2) **Conference Proceedings:** Co-editor of a proceedings volume for the 2011 Bellairs Workshop in Number Theory (with O. Amini and M. Baker). To appear 2013.

(3) **Seminar Organization:**

- (a) Organized a learning seminar on Drinfeld Modules, U. Hawaii (Spring 2012)
- (b) Co-organized a learning seminar on Class Field Theory, with Michelle Manes, U. Hawaii (Fall 2011)
- (c) Co-organized the esteemed Québec–Vermont Number Theory Seminar in Montréal during the academic year 2009–2010 (over 30 speakers).

(4) **Oversight of Student Research:**

- (a) Team of 5 undergraduates analyzing historical fire data for the state of Hawaii, U. Hawaii (Fall 2012)
- (b) Graduate research team studying computational aspects of arithmetic dynamics, 7 students, two papers submitted for publication from this research and one in preparation, U. Georgia (2011–2012)

(5) **Referee:** *Comment. Math. Helv.*, *Compos. Math.*, *Electron. J. Combin.*, *Houston J. Math.*, *Int. J. Number Theory*, *Int. Math. Res. Not.*, *Invent. Math.*, *J. Algebraic Combin.*, *J. Differential Geom.*, *J. Graph Theory*, *J. Number Theory*, *Manuscripta Math.*, *Math. Ann.*, *New York J. Math.*, *Proc. Amer. Math. Soc.*, *Trans. Amer. Math. Soc.*

(6) **Zentralblatt Reviews:** Reviewed 13 articles to date

Software Familiarity

- (1) Extensive use of Python 2.x, Sage, Mathematica 7 – ϵ , LaTeX
- (2) Working knowledge of Octave, HTML 4.1, CSS3, Gimp, MS Excel, OpenOffice

Recent Collaborators and Affiliations

- Matthew H. Baker, co-author and co-editor, Georgia Institute of Technology
- Henri Darmon, postdoctoral supervisor, McGill University, Canada
- Laura DeMarco, co-author, University of Illinois, Chicago
- John Doyle, co-author, University of Georgia (graduate student)
- Andrew Granville, co-author, Université de Montréal, Canada
- Dorian Goldfeld, co-author, Columbia University
- Joseph Hundley, co-author, Southern Illinois University
- Benjamin Hutz, co-author, City University of New York (postdoc)
- David Krumm, co-author, University of Georgia (graduate student)
- Michelle Manes, co-author, University of Hawaii at Manoa
- Robert Rumely, postdoctoral supervisor, University of Georgia
- Michael Stoll, co-author, Universität Bayreuth, Germany
- Adam Towsley, co-author, CUNY Graduate Center
- Bianca Viray, co-author, Brown University (postdoc)
- José Felipe Voloch, co-author, University of Texas, Austin
- Shou-wu Zhang, PhD supervisor, Princeton University

Selected Invited and Internal Lectures

- Center for Communications Research (Princeton) Colloquium, June 2012: “Rational Functions with a Unique Critical Point”
- University of Hawaii Colloquium, April 2012: “Finite Groups of Rotations in Characteristic p ”
- Drinfeld Module Seminar, April 2012: “Factoring Polynomials over Finite Fields”
- Drinfeld Module Seminar, January–February 2012: 4 lectures on “An Introduction to Drinfeld Modules”
- ICERM Workshop on Complex and p -adic Dynamics, February 2012: “The Berkovich Ramification Locus: Structure and Applications”
- University of Hawaii Colloquium, September 2011: “Rational Functions with a Unique Critical Point”
- University of Georgia VIGRE Summer School on Arithmetic Dynamics, May 2011: 3 lectures on “The Berkovich Ramification Locus for Rational Functions.”
- AMS Spring Eastern Sectional Meeting Special Session on Number Theory, Arithmetic Topology, and Arithmetic Dynamics April 2011: “Uniform Bounds for Rational Iterated Pre-Images.”
- Texas A & M University Number Theory Seminar, March 2011: “The Berkovich Ramification Locus for Rational Functions.”
- University of Pittsburgh Algebra, Combinatorics, and Geometry Seminar, February 2011: “The Berkovich Ramification Locus for Rational Functions.”
- Georgia Tech Number Theory Seminar, March 2011: “The Berkovich Ramification Locus for Rational Functions.”
- University of Georgia VIGRE Seminar, August 2010: “Newton’s Method Fails 100% of the Time (conjecturally).”
- Penn State Number Theory Seminar, October 2009: “Prime Factors of Dynamical Sequences.”
- McGill University Explorations Program (for high school students), July 2009: “No really, there are infinitely many prime numbers!”
- Québec-Vermont Number Theory Seminar, September 2008: “The Arithmetic of Orbits for Quadratic Dynamical Systems.”
- New York Number Theory Seminar, May 2008: “The Finite Field Kakeya Problem.”
- Five College Number Theory Seminar, Amherst, Massachusetts, April 2008: “The Effective Geometric Bogomolov Conjecture.”
- Princeton Discrete Mathematics Seminar, April 2008: “The Finite Field Kakeya Problem.”
- Joint Columbia–CUNY–NYU Number Theory Seminar, February 2008: “The Effective Geometric Bogomolov Conjecture.”
- Columbia Discrete Math Seminar, February 2008: “Foster Coefficients and the Jacobian of a Metric Graph.”
- *Ultrametric Dynamical Days*, Santiago, Chile, January 2008: “Equidistribution and Finiteness Results.”