

BIANCA VIRAY

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Education

PhD candidate University of California, Berkeley, Mathematics (advisor: Bjorn Poonen)
2005 B.S. University of Maryland, College Park, cum laude
Spring 2004 Budapest Semesters in Mathematics

Research Interests

Algebraic number theory and arithmetic geometry.

Papers¹

1. *Igusa class polynomials, embeddings of quartic CM fields, and arithmetic intersection theory*, with Helen Grundman, Jennifer Johnson-Leung, Kristin Lauter, Adriana Salerno, and Erika Wittenborn. (submitted.)
2. *Failure of the Hasse principle for Châtelet surfaces in characteristic 2*. (submitted.)
[arXiv:0902.3644](https://arxiv.org/abs/0902.3644)
3. *A family of varieties with exactly one pointless rational fiber*. To appear in *J. Théor. Nombres Bordeaux*. [arXiv:0908.4440](https://arxiv.org/abs/0908.4440)
4. *Hilbert schemes of 8 points in \mathbb{A}^d* , with Dustin A. Cartwright, Daniel Erman, and Mauricio Velasco. To appear in *Algebra Number Theory*. [arXiv:0803.0341](https://arxiv.org/abs/0803.0341)

Summer Employment

Summer 2009 Microsoft Research Intern, Cryptography group, (mentor: Kristin Lauter)
Summer 2008 Center for Communications Research, La Jolla, CA

Academic Honors

2009 – 2010 Ford Foundation Dissertation Fellowship
2007 – 2008 Mentored Research Award, University of California, Berkeley
2007 Honorable Mention, NSF Graduate Research Fellowship Program
2005 Honorable Mention, NSF Graduate Research Fellowship Program
2004 Omicron Delta Kappa, leadership and scholarship fraternity
2004 Higgenbotham Award, University of Maryland, College Park

Research Talks

2009 Nov. *Failure of the Hasse principle for Enriques surfaces*
Number Theory Seminar, Harvard University
2009 Nov. *Igusa class polynomials, the embedding problem, and arithmetic intersection theory*
Number Theory Seminar, Massachusetts Institute of Technology

¹Most recent versions of all preprints are available at <http://math.berkeley.edu/~bviray>

- 2009 Oct. *Failure of the Hasse principle for Enriques surfaces*
Function Fields and their Applications, AMS Special Sessions, Penn State
- 2009 Oct. *Existence of rational points on varieties*
Graduate Student Colloquium, UC Berkeley
- 2009 Aug. *Constructing genus 2 curves for cryptography*
End-of-internship talk, Microsoft Research
- 2009 Apr. *Failure of the Hasse principle for Enriques surfaces*
Diophantine Equations Workshop, Hausdorff Institute
- 2009 Feb. *Failure of the Hasse principle for Enriques surfaces*
Number Theory Seminar, UC Berkeley
- 2008 Nov. *On a conjectural formula of Bruinier-Yang and its connection to Igusa class polynomials*
Women in Numbers Conference, Banff International Research Station
- 2008 June *Hilbert schemes of 8 points*
Algebraic Geometry Seminar, University of Warwick
- 2008 Apr. *Existence of rational points on smooth projective varieties*
Algebra and Number Theory Seminar, University of Maryland College Park
- 2008 Mar. *Hilbert schemes of points in affine space*
Macaulay 2 Conference, Cornell University
- 2007 Oct. *The Hilbert scheme of 8 points in 4 space.*
Baby Algebraic Geometry Seminar, Harvard/MIT

Expository Talks

- 2009 Aug. *Rational Solutions to Polynomial Equations*
Cryptography Lunch, Microsoft Research
- 2009 Apr. *Rational Points on Varieties*
Student Algebraic Geometry Seminar, Stanford University
- 2008 Nov. *Rational Points on Varieties*
Student Algebraic and Arithmetic Geometry Seminar, UC Berkeley
- 2008 Sept. *K3 Surfaces*
Student Algebraic and Arithmetic Geometry Seminar, UC Berkeley
- 2008 Sept. *Kodaira Dimension*
Rest of Algebraic Geometry Seminar, UC Berkeley
- 2007 Oct. *Hecke Algebras*
Modular Forms RIT, University of Maryland, College Park
- 2007 May *Rationally Connected Varieties*
Student Number Theory Seminar, UC Berkeley
- 2006 Apr. *Many Colorful Graphs*
Many Cheerful Facts, UC Berkeley Student Seminar

Service

- 2009 – Organizer of Graduate Student Colloquium, a venue for graduate students nearing completion to give colloquium-style talks connected to their theses
- 2009 – Graduate student mentor.
- 2008 – Active member and co-founder of Unbounded Representation, a student group focused on issues of diversity in mathematics at UC Berkeley.

- 2006 – Active member in Noetherian Ring, a student organization for women mathematicians at UC Berkeley
- 2006 – 2008 Officer of Mathematics Graduate Student Association(MGSA) at UC Berkeley.
- 2005 – 2006 Co-organizer (with Daniel Erman) of Mentor Lecture Series.

Teaching Activities

- 2008 Fall Graduate Student Instructor, UC Berkeley, Analytical Geometry and Calculus II
- 2007 Spring Graduate Student Instructor, UC Berkeley, Advanced Linear Algebra
- 2006 Fall Graduate Student Instructor, UC Berkeley, Multivariable Calculus
- 2006 Spring Graduate Student Instructor, UC Berkeley, Linear Algebra and Differential Equations
- 2005 Fall Graduate Student Instructor, UC Berkeley, Calculus II
- 2005 Spring Strauss Teaching Assistant, University of Maryland, College Park, Calculus II
- 2004 Fall Strauss Teaching Assistant, University of Maryland, College Park, Calculus I

Conferences and Workshops Attended

- 2009 Nov. 2009 Fall Southeastern Section Meeting, Arithmetic Geometry
Florida Atlantic University
- 2009 Oct. 2009 Fall Eastern Section Meeting, Function Fields and their Applications
Pennsylvania State University
- 2009 Apr. Diophantine Equations
Hausdorff Institute
- 2009 Mar. Quadratic Forms
Arizona Winter School
- 2009 Jan. Classical Algebraic Geometry Today
Mathematical Sciences Research Institute
- 2009 Jan. Connections for Women: Algebraic Geometry and Related Fields
Mathematical Sciences Research Institute
- 2008 Dec. Arithmetic of K3 Surfaces
Banff International Research Station
- 2008 Nov. Women in Numbers
Banff International Research Station
- 2008 June Rational Points on Curves and Higher Dimensional Varieties
University of Warwick
- 2008 Mar. Macaulay 2 Conference
Cornell University
- 2007 Nov. Rational Curves and Diophantine Problems over Function Fields
Clay Mathematics Institute
- 2007 Aug. Summer School in Iwasawa Theory
McMaster University
- 2007 July Rational Points on Curves & Higher-Dimensional Varieties: Theory & Explicit Methods
Jacobs University
- 2007 Mar. Arizona Winter School: p -adic Geometry
University of Arizona
- 2006 Aug. Workshop on Computing with Modular Forms
Mathematical Sciences Research Institute
- 2006 Jan. Introductory Workshop in Rational and Integral Points on Higher-Dimensional Varieties
Mathematical Sciences Research Institute