

Bianca Viray

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EMPLOYMENT

- 2017 – Associate Professor, University of Washington
2014 – 2017 Assistant Professor, University of Washington
2010 – 2014 Tamarkin Assistant Professor and NSF Postdoctoral Fellow, Brown University

VISITING APPOINTMENTS

- 2017 Visiting Erskine Fellow, University of Canterbury
2012 Academic guest, Rational Points and Algebraic Cycles program,
Centre Interfacultaire Bernoulli, École Polytechnique Fédérale de Lausanne (EPFL)
2012 Postdoctoral Fellow, Complex and Arithmetic Dynamics program,
Institute for Computational and Experimental Research Mathematics (ICERM)
2009 Intern, Microsoft Research, Cryptography group
2008 Center for Communications Research, La Jolla, CA

EDUCATION

- 2010 Ph.D. Mathematics, University of California, Berkeley (advisor: Bjorn Poonen)
2005 B.S. Mathematics, University of Maryland, College Park, cum laude

AWARDS AND GRANTS

- 2016 – 2021 NSF CAREER Grant, \$449,992
2015 – 2017 NSA Young Investigator Grant, \$40,000.00 (awarded 2014, terminated early in 2016)
2010 – 2014 NSF Postdoctoral Fellowship
2009 – 2010 Ford Foundation Dissertation Fellowship
2007 – 2008 Mentored Research Award, University of California, Berkeley

LECTURE SERIES

- 2015 Arizona Winter School, *Rational points on surfaces* (5 lectures)

INVITED CONFERENCE TALKS

- 2018 Massachusetts Institute of Technology, Arithmetic Geometry, Number Theory, and Computation
Oberwolfach, Explicit Methods in Number Theory
Oberwolfach, Classical Algebraic Geometry
- 2017 SIAM conference on Applied Algebraic Geometry, Georgia Institute of Technology
Plenary speaker
Franken-Akademie Schloss Schney, Rational points 2017
Banff International Research Station, Arithmetic aspects of explicit moduli problems
Emory University, Emory conference on higher obstructions to rational points
University of Amsterdam, Arithmetic and moduli of K3 surfaces
- 2016 American Institute of Mathematics, Rational subvarieties in positive characteristic
Twelfth Algorithmic Number Theory Symposium, University of Kaiserslautern
Plenary speaker
AMS/MAA Joint Mathematical Meetings, Seattle WA,
Special Session on “Number Theory and Cryptography”
- 2015 Clemson University, Palmetto Number Theory Series (PANTS)
Plenary speaker
Brown University, Arithmetic 2015: Silvermania
Graduate student bootcamp for 2015 Algebraic Geometry Summer Research Institute
Franken-Akademie Schloss Schney, Rational Points 2015
AMS Spring Western Sectional Meeting, University of Nevada, Las Vegas
Invited address
University of California, Davis, Western Algebraic Geometry Symposium (WAGS)
- 2014 Seattle, WA, Algebraic geometry: New connections for recent PhDs
- 2013 SIAM Conference on Applied Algebraic Geometry, Fort Collins CO,
Special Session on “Arithmetic Geometry”
Schloss Thurnau, Rational Points 2013
Oberwolfach, Explicit Methods in Number Theory
University of Illinois at Chicago, Complex Dynamics and Related Areas
University of Warwick, Rational Points – Geometric, Analytic and Explicit Approaches
AMS/MAA Joint Mathematical Meetings, San Diego CA,
Special Session on “The Brauer Group in Algebra and Geometry”
- 2012 Universität Zürich, Cohomological Methods in Arithmetic Geometry
Algebraic Geometry Northeastern Series (AGNES), University of Massachusetts, Amherst
Institute for Computational and Experimental Research Mathematics (ICERM),
Global Arithmetic Dynamics
AMS/MAA Joint Mathematical Meetings, Boston MA,
Special Session on “Arithmetic Geometry”
AMS/MAA Joint Mathematical Meetings, Boston MA,
Special Session on “Dynamical Systems in Algebraic and Arithmetic Geometry”

- 2011 Banff International Research Station, Women in Numbers 2
 University of Maine, Maine-Québec Number Theory Conference
 Brown University, 40 Years & Counting: AWM's Celebration of Women in Mathematics
 Oberwolfach, Algebraische Zahlentheorie
 Emory University, Ramification in Algebra and Geometry at Emory
 Spring Eastern Sectional Meeting, College of the Holy Cross,
 Special Session on "Modular Forms, Elliptic Curves, L-functions, & Number Theory"
 Centre International de Rencontres Mathématiques (CIRM, Luminy),
 Arithmetic, Geometry, Cryptography, and Coding Theory 13
- 2010 Lorentz Center, Arithmetic of Surfaces
 Microsoft Research, Workshop on Elliptic Curve Cryptography
 Schloss Thurnau, Rational Points 3
 Centre de Recherches Mathématiques (CRM), Computer Security and Cryptography
- 2009 AMS Fall Southeastern Sectional Meeting, Florida Atlantic University,
 Special Session on "Arithmetic Geometry"
 AMS Fall Eastern Sectional Meeting, Pennsylvania State University,
 Special Session on "Function Fields and their Applications"
- 2008 Cornell University, Macaulay 2 Conference

SELECTED RECENT COLLOQUIA AND SEMINARS

- 2018 Emory University, Athens-Atlanta Joint Number Theory Seminar
- 2017 University of Oregon, AWM Distinguished Speaker Series
 New York University, Algebraic geometry seminar
 University of Canterbury, Colloquium
 University of Wisconsin, Madison, Number theory seminar
 Vanderbilt University, Colloquium
- 2015 Stanford University, Number theory seminar
 University of Chicago, Number theory seminar
 Northwestern University, Number theory seminar
 University of Wisconsin, Madison, Colloquium
 Rice University, Colloquium
 Bellingham Algebraic Geometry Seminar
 Queen's University, Algebraic geometry seminar
- 2014 Simon Fraser University, Joint PIMS/SFU/UBC number theory seminar
 Rutgers University, Algebra seminar
 Cornell University, Colloquium
 Lehman College, Colloquium
 Boston College, Colloquium
 University of Washington, Colloquium
 Georgia Institute of Technology, Colloquium
- 2013 University of Minnesota, Colloquium

Yale University, Algebraic and tropical geometry seminar
 University of Texas, Austin, Number theory seminar
 Boston College/MIT, Joint number theory seminar
 Columbia/CUNY/NYU, Joint number theory seminar
 University of Michigan, Group, Lie, and number theory seminar
 2012 Centre Interfacultaire Bernoulli, Rational points and algebraic cycles seminar
 Oxford University, Number theory seminar
 University of Bristol, Linfoot seminar
 University of Warwick, Number theory seminar
 Center for Communications Research, Princeton, Colloquium
 Harvard University, Number theory seminar
 California Institute of Technology, Algebraic geometry seminar

PUBLICATIONS

1. The d -primary Brauer-Manin obstruction for curves (with Brendan Creutz and José Felipe Voloch). *Research in Number Theory* **4** (2018), no. 2, Article 26, 16 pp.
2. Abelian n -division fields of elliptic curves and Brauer groups of product Kummer and abelian surfaces (with Anthony Várilly-Alvarado). *Forum of Mathematics. Sigma* **5** (2017), e29, 42 pp. doi:10.1017/fms.2017.16
3. Unramified Brauer classes on cyclic covers of the projective plane (with Colin Ingalls, Andrew Obus, and Ekin Ozman and an appendix by Hugh Thomas). *Proceedings of Brauer groups and obstruction problems: moduli spaces and arithmetic*, 115–153, Progress in Mathematics, 320, Springer, [Basel], 2017.
4. Insufficiency of the Brauer-Manin obstruction for Enriques surfaces (with Francesca Balestrieri, Jennifer Berg, Michelle Manes & Jennifer Park). *Directions in Number Theory: Proceedings of the 2014 WIN3 Workshop*, Association for Women in Mathematics Series, vol. 3, Springer, [Cham], 2016, pp. 1–31.
5. Evidence for the dynamical Brauer-Manin criterion (with Ekaterina Amerik, Pär Kurlberg, Khoa Nguyen, Adam Towsley, and José Felipe Voloch). *Experimental Mathematics* **25** (2016), no. 1, 54–65. doi:10.1080/10586458.2015.1056889
6. On Brauer groups of double covers of ruled surfaces (with Brendan Creutz). *Mathematische Annalen* **362** (2015), no. 3, 1169–1200. doi: 10.1007/s00208-014-1153-0
7. On singular moduli for arbitrary discriminants (with Kristin Lauter). *International Mathematics Research Notices*, (2015), no. 19, 9206–9250. doi: 10.1093/imrn/rnu223
8. Denominators of Igusa class polynomials (with Kristin Lauter). *Numéro consacré au trimestre “Méthodes arithmétiques et applications”, automne 2013. Publications Mathématiques de Besançon. Algèbre et Théorie des Nombres. 2014/2* Presses Univ. Franche-Comté, Besançon, 2015, pp. 5–29.

9. Smooth compactifications of certain normic bundles (with Anthony Várilly-Alvarado). *European Journal of Mathematics* **1** (2015), no. 2, 250–259. doi: 10.1007/s40879-015-0035-7
10. An arithmetic intersection theory formula for denominators of Igusa class polynomials (with Kristin Lauter). *American Journal of Mathematics* **137** (2015), no. 2, 497–533. doi: 10.1353/ajm.2015.0010
11. Two torsion in the Brauer group of a hyperelliptic curve (with Brendan Creutz). *Manuscripta Mathematica* **147** (2015), no. 1-2, 139–167. doi: 10.1007/s00229-014-0721-7
12. Corrigendum: Higher dimensional analogs of Châtelet surfaces (with Anthony Várilly-Alvarado). *Bulletin of the London Mathematical Society* **47** (2015), no. 2, 217–218.
13. Computing conjugating sets and automorphism groups of rational functions (with Xander Faber and Michelle Manes). *Journal of Algebra* **423** (2014), 1161–1190. doi: 10.1016/j.jalgebra.2014.08.048
14. Arithmetic of del Pezzo surfaces of degree 4 and vertical Brauer groups (with Anthony Várilly-Alvarado). *Advances in Mathematics* **255** (2014), 153–181. doi: 10.1016/j.aim.2014.01.004
15. On a uniform bound for the number of exceptional linear subvarieties in the Mordell-Lang conjecture (with Joseph H. Silverman). *Mathematical Research Letters* **20** (2013), no. 3, 547–566. doi: 10.4310/MRL.2013.v20.n3.a12
16. Comparing arithmetic intersection theory formulas for denominators of Igusa class polynomials (with Jacqueline Anderson, Jennifer S. Balakrishnan, Kristin Lauter, and Jennifer Park). *Women in Numbers 2: Research Directions in Number Theory*, Contemporary Mathematics, vol. 606, Amer. Math. Soc., Providence, RI, 2013, pp. 65–82.
17. Failure of the Hasse principle for Châtelet surfaces in characteristic 2. *Journal de Théorie des Nombres de Bordeaux* **24** (2012), no. 1, 231–236. doi: 10.5802/jtnb.794
18. Higher-dimensional analogs of Châtelet surfaces (with Anthony Várilly-Alvarado). *Bulletin of the London Mathematical Society* **44** (2012), no. 1, 125–135. doi: 10.1112/blms/bdr075
19. Failure of the Hasse principle for Enriques surfaces. (with Anthony Várilly-Alvarado). *Advances in Mathematics* **226** (2011), no. 6, 4884–4901. doi: 10.1016/j.aim.2010.12.020
20. 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). *WIN—Women in Numbers*, Fields Institute Communications, vol. 60, Amer. Math. Soc., Providence, RI, 2011, pp. 35–60.
21. A family of varieties with exactly one pointless rational fiber. *Journal de Théorie des Nombres de Bordeaux* **22** (2010), no. 3, 741–745. doi: 10.5802/jtnb.743
22. Hilbert schemes of 8 points (with Dustin A. Cartwright, Daniel Erman, and Mauricio Velasco). *Algebra and Number Theory* **3** (2009), no. 7, 763–795. doi: 10.2140/ant.2009.3.763

ACCEPTED FOR PUBLICATION

23. Degree and the Brauer-Manin obstruction (with Brendan Creutz; Appendix by Alexei Skorobogatov). [arXiv:1703.02187](https://arxiv.org/abs/1703.02187), 22 pages. To appear in *Algebra and Number Theory*

SUBMITTED FOR PUBLICATION

24. On the level on modular curves that give rise to sporadic j -invariants. (with Abbey Bourdon, Ozlem Ejder, Yuan Liu, Frances Odumodu). [arXiv:1808.04520](https://arxiv.org/abs/1808.04520), 22 pages. submitted.

BOOKS EDITED

25. Brauer groups & obstruction problems: moduli spaces and arithmetic. Edited with Asher Auel, Brendan Hassett, and Anthony Várilly-Alvarado. *Progress in Mathematics, 320* Birkhäuser/Springer, Basel. vi + 247 pp.

TEACHING
UNIVERSITY OF WASHINGTON, Professor

- 2018 Math 308: Matrix Algebra (2 sections)
 2017 Math 581: Algebraic Number Theory
 Math 308: Matrix Algebra
 Math 480: Cryptography
 2016 Math 402: Introduction to Modern Algebra I
 Math 582: Class Field Theory
 2015 Math 581: Algebraic Number Theory
 Math 124: Calculus with Analytic Geometry I
 Math 403: Introduction to Modern Algebra II
 2014 Math 402: Introduction to Modern Algebra I
 Math 308: Matrix Algebra

UNIVERSITY OF WASHINGTON, Reading courses

- 2018 Elementary Number Theory (1 students)
 Algebraic Number Theory (3 students)
 2017 Arithmetic of elliptic curves (1 student)
 2016 Arithmetic geometry (3 students)
 2015 Rational points on varieties (2 students)
 Algebraic geometry, joint with Max Lieblich (2 students)
 2014 Algebraic geometry, joint with Max Lieblich (4 students)

BROWN UNIVERSITY, Professor

- 2013 Math 19: Advanced Placement Calculus (Physics/Eng.) *Course head*

- Math 158: Cryptography
 Math 156: Number Theory
 2011 Math 153: Abstract Algebra I
 Math 52: Linear Algebra
UC BERKELEY, Teaching assistant
 2008 Math 16b: Analytical Geometry & Calculus II
 2007 Math 110: Advanced Linear Algebra
 2006 Math 53: Multivariable Calculus
 Math 54: Linear Algebra & Differential Equations
 2005 Math 1b: Calculus II
UNIVERSITY OF MARYLAND, COLLEGE PARK, Strauss teaching assistant
 2005 Math 141: Calculus II
 2004 Math 140: Calculus I

CONFERENCE LEADERSHIP

ORGANIZER

- 2020 Foundations of Computational Mathematics, Computational Number Theory Session
 Co-organizers: Nils Bruin and Christophe Ritzenthaler
 2019 CFW: Derived Algebraic Geometry, Birational Geometry and Moduli Spaces
 Co-organizers: Julie Bergner, Antonella Grassi, Kirsten Wickelgren
 2018 Communicating Mathematics Effectively
 Co-organizer: John Voight
 2017 Women in Numbers 4
 Co-organizers: Jennifer Balakrishnan, Chantal David, Michelle Manes
 2015 AMS Spring Western Sectional Meeting: Special session on “Arithmetic geometry”
 Co-organizer: Katherine Stange
 2013 AIM workshop: “Brauer groups & obstruction problems: moduli spaces and arithmetic”
 Co-organizers: Asher Auel, Brendan Hassett, and Anthony Várilly-Alvarado
 AMS/MAA Joint Mathematics Meetings: AWM special session on number theory
 Co-organizer: Kristin Lauter
 2012 Joint Mathematics Meetings: special session on “Rational points on varieties”
 Co-organizers: Jennifer S. Balakrishnan, Bjorn Poonen, and Kirsten Wickelgren

PROGRAM COMMITTEE

- 2012 Tenth Algorithmic Number Theory Symposium (ANTS X)

PROJECT LEADER

- 2017 Women in Numbers 4; Co-leader: Abbey Bourdon
 2015 Graduate student bootcamp, Algebraic Geometry Summer Research Institute
 Arizona Winter School
 2014 Women in Numbers 3; Co-leader: Michelle Manes
 2011 Women in Numbers 2; Co-leader: Kristin Lauter

SERVICE TO THE COMMUNITY

- 2018 – Series editor for *Algorithms and Computation in Mathematics*
- 2018 – Editor for *Research in Number Theory*
- 2018 – 2021 AMS-Simons Travel Grants Committee
- 2015 – Member of Women in Numbers (WIN) Steering Committee
- 2015 – Member of Western Algebraic Geometry Symposium (WAGS) Council
- 2015 – Western Algebraic Geometry Symposium (WAGS) Diversity Committee
- 2012 – Board of directors, Girls' Angle: a math club for girls, see girlsangle.org
- 2011 – Advisory board, Girls' Angle
- 2014 Special Lecturer, Summer Institute for Mathematics at the University of Washington (SIMUW)
- 2011 – 2014 Active member, Rose Whelan society: an organization for women in math at Brown
- 2010 – 2011 Mentor, Girls' Angle

DEPARTMENTAL SERVICE

UNIVERSITY OF WASHINGTON

- 2017 – Appointments committee
- 2014 – Number Theory Seminar Organizer
- 2017 – 2018 Internal chair selection committee
- 2015 – 2017 Planning committee
- 2014 – 2017 Diversity committee
- 2014 – 2018 UW local organizer for Abelian Varieties CRG multi-site seminar

BROWN UNIVERSITY

- 2011 – 2012 Graduate admissions committee (2 years)
- 2010 Panelist, “Applying for academic jobs”

UC BERKELEY

- 2009 – 2010 Graduate student mentor
- 2009 – 2010 Founder and Organizer, Graduate Student Colloquium
- 2008 – 2010 Co-founder and active member, Unbounded Representation: an organization focused on issues of diversity in mathematics at UC Berkeley
- 2006 – 2010 Active member, Noetherian Ring: an organization for women in math at UC Berkeley
- 2006 – 2008 Officer of Mathematics Graduate Student Association
- 2005 – 2006 Organizer, Mentor Lecture Seminar Series
Co-organizer: Daniel Erman

ADVISING

- Sam Roven, Ph.D. (expected)
- Caleb Geiger, Ph.D. (expected)
- Manar Rimani, Ph.D. (expected)

UW STUDENT EXAM COMMITTEES

- 2018 Doctoral reading committee for Siddharth Mathur
- General exam committee for Anthony Sanchez
- General exam committee for Kevin Lui
- General exam committee for Samantha Fairchild
- 2017 General exam committee for Gerardo Zelaya
- 2016 General exam committee for Kristin DeVleming
- General exam committee for Manar Rimani
- 2015 General exam committee for Siddharth Mathur
- Doctoral reading committee for Pál Zsomboki
- Oral preliminary exam committee for Daniel Bragg
- Oral preliminary exam committee for Lucas Van Meter
- General exam committee for Riley Casper

BROWN STUDENT EXAM COMMITTEES

- 2014 Topics exam committee for Ken Ascher
- 2012 Topics exam committee for Martin Ulirsch
- 2011 Topics exam committee for Wade Hines
- 2011 Topics exam committee for Dimitrios Moirogiannis
- 2010 Topics exam committee for Jacqueline Anderson