

# Bianca Viray

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## EMPLOYMENT

2021 – Professor, University of Washington  
2017 – 2021 Associate Professor, University of Washington  
2014 – 2017 Assistant Professor, University of Washington  
2010 – 2014 Tamarkin Assistant Professor and NSF Postdoctoral Fellow, Brown University

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## VISITING APPOINTMENTS

2021 – 2022 Visiting professor, MIT  
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

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## EDUCATION

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

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## AWARDS AND GRANTS

2021 – 2024 NSF Grant, \$307,257  
2021 Fellow of the AMS  
2021 – 2022 Simons Fellowship NSF CAREER Grant, \$449,992  
2020 International Visitor, Sydney Math Research Inst. (cancelled due to COVID-19)  
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

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## LECTURE SERIES

2020 PCMI, “Number Theory Informed by Computation” (3-4 lectures) (Postponed to 2022 to COVID-19)  
2015 Arizona Winter School, *Rational points on surfaces* (5 lectures)

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## SELECTED INVITED CONFERENCE TALKS

- 2020 Connecticut Summer School in Number Theory, University of Connecticut  
AMS/MAA Joint Mathematical Meetings, Denver CO,  
Special Session on “Rational Points on Varieties: Theory and Computation”  
AMS/MAA Joint Mathematical Meetings, Denver CO,  
Special Session on “Explicit Methods in Arithmetic Geometry in Characteristic  $p$ ”
- 2019 RIMS Symposia: Rational Points on Higher Dimensional Varieties  
Modular Forms, Arithmetic, and Women in Mathematics, Emory University  
Southern California Number Theory Days, University of California, Irvine  
Heilbronn Annual Conference, University of Bristol  
Rational Points on Irrational Varieties, Institut Henri Poincaré (IHP)  
Arithmetic, Geometry, Cryptography, and Coding Theory 17, CIRM, Luminy  
*Plenary speaker*  
Algebra and Number Theory Day, Johns Hopkins University & University of Maryland  
Geometry and Arithmetic of Surfaces Workshop, University of Wisconsin, Madison  
Simons Collaboration on Arithmetic Geometry, Number Theory, and Computation  
Annual Meeting, Simons Foundation
- 2018 Arithmetic Geometry, Number Theory, and Computation, Massachusetts Institute of Technology  
Explicit Methods in Number Theory, Oberwolfach  
Classical Algebraic Geometry, Oberwolfach
- 2017 SIAM conference on Applied Algebraic Geometry, Georgia Institute of Technology  
*Plenary speaker*  
Rational points 2017, Franken-Akademie Schloss Schney  
Arithmetic aspects of explicit moduli problems, Banff International Research Station  
Emory conference on higher obstructions to rational points, Emory University  
Arithmetic and moduli of K3 surfaces, University of Amsterdam
- 2016 Rational subvarieties in positive characteristic, American Institute of Mathematics  
Twelfth Algorithmic Number Theory Symposium, University of Kaiserslautern  
*Plenary speaker*
- 2015 Palmetto Number Theory Series (PANTS), Clemson University  
*Plenary speaker*  
Arithmetic 2015: Silvermania, Brown University  
Rational Points 2015, Franken-Akademie Schloss Schney  
AMS Spring Western Sectional Meeting, University of Nevada, Las Vegas  
*Invited address*  
Western Algebraic Geometry Symposium (WAGS), University of California, Davis

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## SELECTED COLLOQUIA AND SEMINARS

- 2021 Brown University, Algebra seminar  
Massachusetts Institute of Technology, Number theory seminar

- San Francisco State University, Algebra, Geometry, and Combinatorics Seminar  
 University of Georgia, Number theory seminar  
 VaNTAGe Seminar, A virtual math seminar on open conjectures in number theory and arithmetic geometry  
 Ohio State University, Colloquium  
 University of Waterloo, Colloquium  
 2020 Mathematical Conversations at Home, Institute for Advanced Study  
 University of Pittsburgh, Colloquium  
 Stony Brook University, Algebraic Geometry Seminar  
 Zoom Algebraic Geometry Seminar  
 Number Theory Web Seminar  
 Simon Fraser University, Quarantined Number Theory and Algebraic Geometry Seminar  
 Rice University, Colloquium (cancelled due to COVID-19)  
 University of Utah, AWM-RTG Colloquium  
 2018 Emory University, Athens-Atlanta Joint Number Theory Seminar  
 2017 University of Oregon, AWM Distinguished Speaker Series  
 University of Canterbury, Colloquium  
 Vanderbilt University, Colloquium  
 2015 University of Wisconsin, Madison, Colloquium  
 Rice University, Colloquium

## PUBLICATIONS

1. On the level of modular curves that give rise to isolated  $j$ -invariants (with A. Bourdon, Ö. Ejder, Y. Liu, and F. Odumodu). *Advances in Mathematics* **357** (2019).
2. Degree and the Brauer-Manin obstruction (with B. Creutz and an appendix by A. Skorobogatov). *Algebra Number Theory* **12** (2018), no. 10, 2445-2470.
3. 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.
4. 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
5. 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.
6. 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.

7. 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
8. 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
9. On singular moduli for arbitrary discriminants (with Kristin Lauter). *International Mathematics Research Notices*, (2015), no. 19, 9206–9250. doi: 10.1093/imrn/rnu223
10. 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.
11. 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
12. 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
13. 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
14. Corrigendum: Higher dimensional analogs of Châtelet surfaces (with Anthony Várilly-Alvarado). *Bulletin of the London Mathematical Society* **47** (2015), no. 2, 217–218.
15. 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
16. 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
17. 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
18. 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.
19. 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

20. 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
21. 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
22. 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.
23. 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
24. 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

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## SUBMITTED FOR PUBLICATION

25. Quadratic points on intersections of quadrics. (with Brendan Creutz). [arXiv:2106.08560](#), 30 pages.

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## BOOKS EDITED

26. 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.

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## TEACHING

**UNIVERSITY OF WASHINGTON**, Professor

- 2021 Math 301: Elementary Number Theory  
Math 300: Introduction to Mathematical Reasoning (2 sections)
- 2020 Math 308: Matrix Algebra  
Math 583: Communicating Mathematics Effectively  
Math 404: Introduction to Modern Algebra III  
Math 403: Introduction to Modern Algebra II
- 2019 Math 308: Matrix Algebra  
Math 480: Cryptography
- 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 and research groups
- 2019 Algebraic Number Theory (2 students)  
WXML group on embeddings of genus 0 curves (2 students)
- 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

- 2022 Pacific Rim Mathematica Association (PRIMA) Conference Special Session “Arithmetic geometry: theory and computation”  
Co-organizer: Sho Tanimoto
- 2022 Roots of Unity workshop (planned)  
Co-organizers: Christine Berkesch, Michelle Manes, Priyam Patel, Candice Price, and Adriana Salerno

- 2020 – paraDIGMS: Diversity in Graduate Mathematical Sciences Fall and Spring Conferences  
Co-organizers: Matthew Ando, Justin Lanier, Marissa Loving
- 2020 Western Algebraic Geometry Symposium  
Co-organizers: Jarod Alper, Edray Goins, Dagan Karp
- Modern Breakthroughs in Diophantine Problems, BIRS  
Co-organizers: Michael Bennett, Nils Bruin, Samir Siksek
- Foundations of Computational Mathematics, Computational Number Theory Session  
Co-organizers: Nils Bruin & Christophe Ritzenthaler (Cancelled due to COVID-19)
- 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/SCIENTIFIC COMMITTEE**
- 2022 Rational Points Conference
- 2012 Tenth Algorithmic Number Theory Symposium (ANTS X)
- PROJECT LEADER**
- 2020 Women in Algebraic Geometry; Co-leader: Isabel Vogt
- 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

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## SERVICE TO THE COMMUNITY

- 2021 Member, AMS Committee on Committees
- 2021 – Mentor, BAMB: Bolstering the Advancement of Masters in Mathematics, Math Alliance (1 student)
- 2020 – Co-organizer, paraDIGMS: Diversity in Graduate Mathematical Sciences
- 2020 Co-organizer, *Tea time with a number theorist*, a weekly informal zoom chat with a number theorist, open to all who wish to attend.



- 2020 Moderator, *Algebraic geometry syndicate*, an online community of over 2000 members where students and early career mathematicians can form reading groups, receive career advice, and find community, virtually.
- 2020 – 2023 Member, AMS Policy Committee on Publications
- 2020 – 2023 Member-at-large, AMS Council
- 2018 – Series editor, *Algorithms and Computation in Mathematics*
- 2018 – Editor, *Research in Number Theory*
- 2018 – 2021 Member, AMS-Simons Travel Grants Committee
- 2015 – Chair, Western Algebraic Geometry Symposium (WAGS) Diversity Committee
- 2015 – Member, Western Algebraic Geometry Symposium (WAGS) Council
- 2015 – Member, Women in Numbers (WIN) Steering Committee
- 2012 – Board of directors, Girls' Angle: a math club for girls, see [girlsangle.org](http://girlsangle.org)
- 2011 – Advisory board, Girls' Angle
- 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

- 2020 – 2021 308 course coordinator
- 2020 – 2021 Graduate program committee
- 2019 – 2020 AWM student chapter faculty mentor
- 2019 – 2021 Diversity committee (chair)
- 2017 – 2020 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



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## ADVISING

Carlos Rivera, Ph.D. (expected)

Thomas Carr, Ph.D. (expected)

Sam Roven, Ph.D. (expected)

2021 Jon Kim, B.S.

2020 Caleb Geiger, M.S.

2019 Manar Riman, Ph.D.

2019 Blanca Vina, B.S.

### UW STUDENT EXAM COMMITTEES

2021 Doctoral reading committee for Anthony Sanchez

Doctoral reading committee for Samantha Fairchild

2020 General exam committee for Hao Geng (physics)

2018 General exam committee for Tuomas Tajakka

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

2015 General exam committee for Siddharth Mathur

Doctoral reading committee for Pál Zsamboki

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 Hindes

2011 Topics exam committee for Dimitrios Moirogiannis

2010 Topics exam committee for Jacqueline Anderson