

Anthony Várilly-Alvarado

Curriculum Vitae

June 2017

Department of Mathematics
Rice University, MS 136
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Employment

- 2009– **Rice University**, Houston, TX
Associate Professor, 2016–present
Assistant Professor, 2012–2016
G. C. Evans Instructor, 2009–2012
- 2012 (Fall) **École Polytechnique Fédérale de Lausanne (EPFL)**, Lausanne, Switzerland
Postdoctoral Researcher

Visiting Appointments

- 2016 (April) **Pacific Institute for the Mathematical Sciences, SFU**, Burnaby, Canada
Distinguished Visitor
- 2012 (Sum.) **Centre Interfacultaire Bernoulli, EPFL**, Lausanne, Switzerland
Academic Guest
- 2007 (Sum.) **IRMAR, Université de Rennes 1**, Rennes, France
Marie Curie Early-stage Researcher

Education

- 2009 **University of California at Berkeley**, Berkeley, CA
Ph.D. in Mathematics (advisor : Bjorn Poonen)
- 2004 **University of Cambridge**, Cambridge, UK
Certificate of Advanced Study in Mathematics *with distinction*
- 2003 **Harvard University**, Cambridge, MA
A.B. Mathematics *magna cum laude*

Grants

- 2014–2019 NSF CAREER grant DMS-1352291 (sole PI, \$405,090) : Arithmetic of Surfaces
- 2015–2017 NSA Young Investigator grant (sole PI, \$40,000 — declined)
- 2011–2015 NSF grant DMS-1103659 (sole PI, \$101,149) : Algebraic surfaces : Rational points and Cox rings
- 2011–2012 NSF grant DMS-1101618 (PI, \$14,700) : Texas Algebraic Geometry Symposium

Honors and Awards

- 2017 Faculty Fellow, Center for Teaching Excellence, Rice University (2017-2020)
- 2016 George R. Brown Award for Superior Teaching, Rice University
- 2013 Sophia Meyer Farb Prize for Teaching, Phi Beta Kappa, Rice University
- 2009 Nikki Kose Memorial Teaching Prize, Mathematics Department, UC Berkeley
- 2007 Outstanding Graduate Student Instructor Award recipient, UC Berkeley
- 2003–2004 Herchel Smith Fellowship for study at Emmanuel College, Cambridge University
- 2004 Herman Peries Prize, for excellent performance in Part III of the Mathematical Tripos
- 2003 Phi Beta Kappa
- 1999–2003 John Harvard Scholarship
- 2001–2002 Derek Bok Center Certificate of Distinction in Teaching, Harvard University (awarded 4 times)
- 2003 Blumberg Creative Science Prize (undergraduate thesis award; Mather House)
- 2000 The Key Innovator Award for research using The Geometer's Sketchpad.

Publications

Books

1. Brauer groups and obstruction problems: moduli spaces and arithmetic (A. Auel, B. Hassett, A. Várilly-Alvarado, B. Viray eds.)
Progress in Mathematics **320**, Birkhäuser, 2017.

Papers

2. Abelian n -division fields of elliptic curves and Brauer groups of product Kummer & abelian surfaces (w/ B. Viray)
Forum of Mathematics, Sigma, to appear. arXiv:1606.09240
3. Campana points, Vojta's conjecture, and level structures on semistable abelian varieties. (w/ D. Abramovich)
Journal de Théorie des Nombres de Bordeaux, to appear. arXiv:1608.05651
4. Kodaira dimension of moduli of special cubic fourfolds (w/ S. Tanimoto)
Journal für die reine und angewandte Mathematik (Crelle), to appear. DOI: 10.1515/crelle-2016-0053
5. Level structures on abelian varieties and Vojta's conjecture (w/ D. Abramovich; Appendix by K. Madapusi-Pera)
Compositio Mathematica, **153** (2017), 373–394.
6. Brauer groups on K3 surfaces and arithmetic applications (w/ K. McKinnie, J. Sawon and S. Tanimoto)
Brauer groups and obstruction problems: moduli spaces and arithmetic (A. Auel, B. Hassett, A. Várilly-Alvarado, and B. Viray eds.),
Progress in Mathematics **320**, Birkhäuser (2017), 177–218.
7. Arithmetic of K3 surfaces (Notes for the 2015 Arizona Winter School)
Geometry over nonclosed Fields, (F. Bogomolov, B. Hassett and Y. Tschinkel eds.),
Simons Symposia **5**, Springer (2017), 197–248.
8. Kodaira Dimension of certain orthogonal modular varieties
Oberwolfach Reports **12** (2015), 1835–1837.
9. Smooth compactifications of certain normic bundles (w/ B. Viray)
European Journal of Mathematics **1** (2015), 250–259.
10. On the unirationality of del Pezzo surfaces of degree two (w/ C. Salgado and D. Testa)
Journal of the London Mathematical Society **90** (2014), 121–139.
11. Arithmetic of del Pezzo surfaces of degree 4 and vertical Brauer groups (w/ B. Viray)
Advances in Mathematics **255** (2014), 153–181.
12. Cubic fourfolds containing a plane and a quintic del Pezzo surface (w/ A. Auel, M. Bernardara, and M. Bolognesi)
Algebraic Geometry **1** (2014), 181–193.
13. Failure of the Hasse principle on general K3 surfaces (w/ B. Hassett)
Journal de l'Institut de Mathématiques de Jussieu **12** (2013), 853–877.
14. Arithmetic of del Pezzo surfaces
Birational geometry, rational curves, and arithmetic, (F. Bogomolov, B. Hassett and Y. Tschinkel eds.)
Simons Symposia **1**, Springer (2013), 293–319.
15. Higher dimensional analogues of Châtelet surfaces (w/ B. Viray)
Bulletin of the London Mathematical Society **44** (2012), 125–135. Corrigendum: **47** (2015), 217–218.
16. Density of rational points on isotrivial rational elliptic surfaces
Algebra & Number Theory **5** (2011), 659–690.
17. Transcendental obstructions to weak approximation on general K3 surfaces (w/ B. Hassett and P. Várilly)
Advances in Mathematics **228** (2011), 1377–1404.
18. Failure of the Hasse principle for Enriques surfaces (w/ B. Viray)
Advances in Mathematics **226** (2011), 4884–4901.

19. Laurent polynomials and Eulerian numbers (w/ D. Erman and G. G. Smith)
Journal of Combinatorial Theory Series A **118** (2011), 396–402.
20. Big rational surfaces (w/ D. Testa and M. Velasco)
Mathematische Annalen **351** (2011), 95–107.
21. Cox rings of degree one del Pezzo surfaces (w/ D. Testa and M. Velasco)
Algebra & Number Theory **3** (2009), 729–761.
22. Arithmetic E_8 -lattices with maximal Galois action (w/ D. Zywinia)
LMS Journal of Computation and Mathematics **12** (2009), 144–165.
23. Arithmetic of del Pezzo surfaces of degree 1
Ph. D. Thesis, UC Berkeley (2009)
24. Weak approximation on del Pezzo surfaces of degree 1
Advances in Mathematics **219** (2008), no. 6, 2123–2145.
25. Location of incenters and Fermat points in variable triangles
Mathematics Magazine **74** (2001), 123–129.

Preprints

26. Locally recoverable codes from algebraic curves and surfaces (w/ A. Barg, K. Haymaker, E. Howe, G. Matthews)
Submitted. arXiv:1701.05212
27. Cubic fourfolds fibered in sextic del Pezzo surfaces (w/ N. Addington, B. Hassett, Yu. Tschinkel)
Submitted. arXiv:1606.05321
28. Level structures on abelian varieties, Kodaira dimensions, and Lang’s conjecture (w/ D. Abramovich)
Submitted. arXiv:1601.02483

Invited Lecture Series

- 05.2017 Positivity in Arithmetic and Geometry (Orsay, France)
Level structures on K3 surfaces and abelian varieties (3 lectures)
- 03.2015 Arizona Winter School (Tucson)
Arithmetic of K3 Surfaces (4 lectures)
- 06.2013 Universidad de Costa Rica (San José, Costa Rica)
El Teorema de Hasse-Minkowski (5 lectures)
- 07.2012 Centre Interfacultaire Bernoulli (Lausanne, Switzerland)
Arithmetic of del Pezzo and K3 surfaces (14 lectures)
- 10.2010 Lorentz Center (Leiden, The Netherlands)
Arithmetic of del Pezzo surfaces (3 lectures)

Invited Conference Talks

- 09.2017 Special Session on Numbers, Functions, Transcendence, and Geometry, AMS Sectional Meeting (Denton)
- 07.2017 Mathematical Congress of the Americas (Montréal, Canada)
- 07.2017 Rational Points 2017 (Schney, Germany)
- 04.2017 Atkin Workshop (UIC, Chicago)
- 03.2017 New Trends in Arithmetic and Geometry of Algebraic Surfaces (Banff, Canada)
- 01.2017 K3 Days (Amsterdam, The Netherlands)
- 11.2016 CA+ (Madison)
- 09.2016 Arithmetic Algebraic Geometry (Bogomolov 70; NYU, New York)
- 10.2015 Georgia Algebraic Geometry Symposium (Emory, Atlanta)
- 10.2015 Explicit methods for modularity of K3 Surfaces and other higher weight motives (ICERM, Providence)
- 07.2015 AMS Summer Institute in Algebraic Geometry (Salt Lake City)
- 07.2015 Explicit Methods in Number Theory (Oberwolfach, Germany)

- 04.2015 Special Session on Arithmetic Geometry, AMS Sectional Meeting (Las Vegas)
- 04.2015 Texas Algebraic Geometry Symposium (College Station)
- 03.2015 Simons Symposium “Geometry over non-closed fields” (Puerto Rico)
- 12.2014 Palmetto Number Theory Series XXIII; Plenary Speaker (PANTS–Columbia, South Carolina)
- 11.2014 K3, Enriques surfaces, and related topics (Nagoya, Japan)
- 07.2014 Frontiers of Rationality (Spitsbergen, Norway)
- 05.2014 Rational and integral points on higher-dimensional varieties (AIM, Palo Alto)
- 03.2014 Special Session on Galois cohomology and the Brauer group, AMS Sectional Meeting (Knoxville)
- 08.2013 SIAM Conference on Applied Algebraic Geometry (Fort Collins)
- 03.2013 New Trends in arithmetic and geometry of algebraic surfaces (CIRM Luminy, France)
- 09.2012 Rational and integral points, with special reference to homogeneous spaces (Beijing, China)
- 07.2012 Summer Workshop in Algebraic and Arithmetic Geometry, (Münich, Germany)
- 02.2012 Simons Symposium “Geometry over non-closed fields” (U. S. Virgin Islands)
- 01.2012 Special Session on Rational Points on Varieties, Joint Mathematical Meetings of the AMS (Boston)
- 05.2011 Ramification in Algebra and Geometry (Atlanta)
- 04.2011 Western Algebraic Geometry Symposium (WAGS–Stanford, Palo Alto)
- 07.2010 Rational Points 3 (Thurnau, Germany)
- 05.2010 Rational Points: Theory & Experiment (Zürich, Switzerland)
- 01.2010 Special Session on Arithmetic Geometry, Joint Mathematical Meetings of the AMS (San Francisco)
- 10.2009 Special Session on Arithmetic Geometry, AMS Sectional Meeting (Boca Raton)
- 04.2009 Counting points on varieties (Leiden, The Netherlands)
- 06.2008 Rational points on curves and higher dimensional varieties (Warwick, UK)

Contributed Conference Talks

- 02.2013 American Institute of Mathematics (Palo Alto)
- 04.2009 Hausdorff Research Institute for Mathematics (Bonn, Germany)
- 07.2007 Rational points on curves and higher-dimensional varieties (Bremen, Germany)

Seminar and Colloquium Talks

- 03.2017 Yale University, Algebraic and Tropical Geometry Seminar
- 11.2016 University of Houston, Complex Geometry Seminar
- 04.2016 University of Washington, UW-PIMS Colloquium
- 04.2016 University of Washington, Number Theory Seminar
- 04.2016 Simon Fraser University, CRG Abelian Varieties Multi-site Seminar
- 04.2016 Simon Fraser University, PIMS-SFU Colloquium
- 03.2016 Brown University, Algebra Seminar
- 03.2016 University of Virginia, Department Colloquium
- 03.2016 University of Utah, Algebraic Geometry Seminar
- 02.2016 Sam Houston State University, Department Colloquium
- 02.2016 Stony Brook University, Algebraic Geometry Seminar
- 02.2016 University of Oregon, Number Theory Seminar
- 02.2016 University of Oregon, Department Colloquium
- 12.2015 Wesleyan University, Department Colloquium
- 10.2015 University of Texas at Austin, Number Theory Seminar
- 09.2015 Rice University, Department Colloquium
- 05.2015 Universidade Federal do Rio de Janeiro, Algebra Seminar
- 04.2015 Stanford University, Number Theory Seminar
- 02.2015 Boston College, Number Theory & Algebraic Geometry Seminar
- 01.2015 Queen’s University, Algebraic Geometry Seminar
- 09.2014 University of Texas at Austin, Number Theory Seminar
- 04.2014 Joint IMPA/UFRJ/UFF Colóquio de Geometria e Aritmética, Rio de Janeiro
- 04.2014 Texas A & M University, Algebraic Geometry Seminar
- 02.2014 Universidad de los Andes, Department Colloquium
- 10.2013 University of North Carolina at Chapel Hill, Arithmetic Geometry Seminar
- 10.2013 University of Wisconsin, Number Theory Seminar

05.2013	University of Washington, Algebraic Geometry Seminar
04.2013	University of Houston, Complex Geometry Seminar
01.2013	Texas Christian University, Department Colloquium
01.2013	Rice University, Department Colloquium
12.2012	Humboldt Universität zu Berlin, Forschungsseminar Arithmetische Geometrie
12.2012	Leibnitz Universität Hannover, Algebraic and Arithmetic Geometry Seminar
12.2012	University of Warwick, Algebraic Geometry Seminar
11.2012	University of Bristol and Heilbronn Institute, Number Theory Seminar
10.2012	Centre Interfacultaire Bernoulli (École Polytechnique Fédéral de Lausanne), RatPAC Seminar
06.2012	Universidad de Costa Rica, Department Colloquium
05.2012	University of Texas at Austin, Number Theory Seminar
04.2012	Texas A & M University, Number Theory Seminar
04.2012	Joint Columbia/CUNY/NYU Number Theory Seminar
02.2012	Michigan State University, Department Colloquium
01.2012	University of Alberta, Department Colloquium
01.2012	Colorado State University, Department Colloquium
01.2012	University of North Carolina at Chapel Hill, Department Colloquium
01.2012	University of Illinois at Urbana-Champaign, Department Colloquium
01.2012	University of Notre Dame, Department Colloquium
11.2011	Rice University, Department Colloquium
10.2011	California Institute of Technology, Algebraic Geometry Seminar
05.2011	Brown University, Algebra Seminar
02.2011	University of Wisconsin Madison, Number Theory Seminar
02.2011	University of Wisconsin Madison, Algebraic Geometry Seminar
09.2010	Rice University, Algebraic Geometry Seminar
09.2009	Rice University, Algebraic Geometry Seminar
09.2009	Texas A&M University, Algebraic Geometry Seminar
08.2009	Rice University, Department Colloquium
02.2009	Emory University, Algebra Seminar
11.2008	Massachusetts Institute of Technology, Number Theory Seminar
06.2008	École Normale Supérieure, Séminaire variétés rationnelles
11.2007	Brown University, Algebraic Geometry Seminar
10.2007	Boston University, Algebra Seminar
06.2007	Université de Rennes 1 (IRMAR), Séminaire de géométrie algébrique
04.2007	UC Berkeley, Number Theory Seminar
11.2006	UC Berkeley, Number Theory Seminar

Graduate Students and Post-doctoral faculty

Postdocs, career mentor

2016–2019	Jennifer Berg (RTG Instructor)
2016–2019	Anastassia Etropolski (RTG Instructor)
2015–2018	John Calabrese (NSF Post-doctoral Fellow and G. C. Evans Instructor)
2015–2017	Ye Luo (G. C. Evans Instructor)
2014–2017	Richard Shadrach (G. C. Evans Instructor)
2012–2015	Sho Tanimoto (G. C. Evans Instructor)

Postdocs, teaching mentor

2014–2015	Ye Luo (G. C. Evans Instructor)
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Graduate students, primary advisor

2016–	Jack Petok
2015–	Stephen Wolff
2014–	Alexis Johnson
2013–	Masahiro Nakahara

Ph. D. Thesis committees

2016	Dino Festi (Leiden / Milano; advised by Ronald van Luijk / Bert van Geemen)
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- 2016 Derek Allums (Rice; advised by Brendan Hassett)
- 2016 Jennifer Berg (UT Austin; advised by Felipe Voloch)
- 2015 Natalie Durgin (Rice; advised by Brendan Hassett)
- 2015 Nikita Kozin (Rice; advised by Brendan Hassett)
- 2013 René Pannekoek (Universiteit Leiden; advised by Ronald van Luijk)

Master's Thesis committees

- 2014 José Dario Bastidas Olaya (Universidad de los Andes; advised by Mauricio Velasco)

Advanced Exam Committee

- 2016 Javier Carvajal-Rojas (University of Utah)
- 2014 Kuan-Wen Lai
- 2013 Derek Allums
- 2010 Letao Zhang

Service to the Rice University Mathematics Department

- 2016– Graduate admissions committee (chair).
- 2015– Appointments committee.
- 2013– Algebra qualifying exam overseer.
- 2015–2016 Evans post-doctoral hiring committee.
- 2014 (Fall) Calculus Coordinator
- 2012–2015 Graduate admissions committee (co-chair 2012–2013; chair 2013–2015).
- 2012–2013 Evans post-doctoral hiring committee.
- 2010–2012 Colloquium committee (chair 2011–2012).
- 2009–2012 Computer committee.

Service to Rice University

- 2016–2017 Faculty Advisory Board for the Program for Writing & Communication
- 2015–2016 University Committee on Examinations and Standing
- 2014–2015 University Committee for Faculty & Staff Benefits
- 2013–2014 President's Lecture Series Committee
- 2013–2014 First Year Mentor for an O-week group, McMurtry College
- 2010– Faculty Associate, McMurtry College

Service to the Community

- 2015–2019 Founder and Director, Patterns, Math & You (program for middle school students)
- 2016 Presentation aimed at the Houston community at the Rice Science Café
- 2015 Presented enhancement lecture to high-school students in the Tapia Math–Science Scholars Program
- 2013 Presented lecture to mathematics high-school students and teachers at the Rice University Mathematics Tournament
- 2012 Presented lecture to mathematics high-school students at the British School of Costa Rica
- 2010 Presented lecture to mathematics high-school teachers at the Mathematics Leadership Institute

Service to the Profession

Professional Committees

- 2017–2020 Human Resources Advisory Committee, Mathematical Sciences Research Institute (MSRI)

Conference Organizer

- 05.2018 Birational Geometry and Arithmetic; ICERM (co-organizers: A. Auel, M. Pieropan, S. Tanimoto, Y. Tschinkel)
- 10.2017 Open source computation and algebraic surfaces; Banff International Research Station Workshop 17w2677 (co-organizers: S. Brandhorst and U. Whitcher)
- 08.2017 SIAM AG 17 Mini-symposium: Algebraic coding for storage applications (co-organizer: A. Barg)
- 04.2017 Texas Algebraic Geometry Symposium 2014 (co-organizer: J. Calabrese)
- 02.2017 RTG meeting: Lectures in Arithmetic Geometry at Rice (co-organizers: J. Berg, A. Etopolski)
- 05.2015 Rational Points / Pontos Racionais; IMPA, Rio de Janeiro (co-organizers: A. Auel, O. Lorscheid, C. Salgado)

- 04.2014 Texas Algebraic Geometry Symposium 2014 (co-organizer: B. Hassett)
- 02.2013 Brauer groups and obstruction problems: moduli spaces and arithmetic; AIM (co-organizers: A. Auel, B. Hassett, B. Viray)
- 04.2011 Texas Algebraic Geometry Symposium 2011 (co-organizers: E. Bullock, B. Hassett)

Panels

- 2016 Panelist for the National Science Foundation
- 2015 Panelist for the National Science Foundation
- 03.2014 Association for Women in Mathematics panel: negotiating a salary (organizer: K. Vance)

Referee

Acta Arithmetica, Advances in Mathematics, Algebra and Number Theory, Algebraic Geometry, Bulletin of the London Mathematical Society, Central European Journal of Mathematics, Compositio Mathematica, European Journal of Mathematics, International Journal of Number Theory, International Math Research Notices, Inventiones Mathematicae, Journal de Théorie de Nombres de Bordeaux, Journal of Pure and Applied Algebra, LMS Journal of Computation and Mathematics, Mathematische Annalen, Monatshefte für Mathematik, New York Journal of Mathematics, Pacific Journal of Mathematics, Proceedings of the American Mathematical Society, Proceedings of the London Mathematical Society, Transactions of the American Mathematical Society.

Mentor

Post-doctoral assistant for VIGRE-funded Research Experience for Undergraduates on singularities of plane curves, Rice University (Summer 2009)

Teaching

Rice University

- Average teaching evaluation score: 1.216/5 (1 = “Outstanding”; 847 students)
- 2017, Fall Math 376 : Algebraic Geometry
- 2017, Fall Math 354 : Honors Linear Algebra
- 2016, Fall Math 463/563 : Rings, Modules, and Galois Theory
- 2016, Fall Math 354 : Honors Linear Algebra
- 2015, Fall Math 354 : Honors Linear Algebra
- 2014, Fall Math 567 : Arithmetic of Elliptic Curves
- 2014, Fall Math 101 : Single Variable Calculus I
- 2014, Spring Math 466/566 : Algebraic Number Theory
- 2013, Fall Math 463/563 : Rings, Modules, and Galois Theory
- 2013, Spring Math 464/564 : Commutative and homological algebra
- 2012, Spring Math 102 : Single Variable Calculus II
- 2011, Fall Math 101 : Single Variable Calculus I
- 2011, Fall Math 365 : Number Theory
- 2011, Spring Math 567 : Topics in Algebraic Geometry: Algebraic Surfaces
- 2011, Spring Math 102 : Single Variable Calculus II
- 2010, Fall Math 373 : Elliptic Curves
- 2010, Spring Math 112 : Calculus and its applications
- 2010, Spring Math 464 : Commutative and homological algebra
- 2009, Fall Math 101 : Single Variable Calculus I

Reading courses at Rice University

- 2013, Spring Algebraic Geometry (following Hartshorne’s book); 4 students

University of California at Berkeley

Average teaching evaluation score: 6.8/7 (7 = "Excellent"; 221 students)
2009, Spring Math 300 : Teaching Workshop for graduate student instructors (Lecturer)
2008, Fall Math 300 : Teaching Workshop for graduate student instructors (Assistant)
2008, Summer Math 115 : Introduction to Number Theory (Lecturer)
2008, Spring Math 74 : Transition to Upper Division Mathematics (Lecturer)
2007, Spring Math 1b : Calculus in One Variable II (Professional Development Program)
2006, Fall Math 1a : Calculus in One Variable I (Professional Development Program)
2005, Fall Math 53 : Multivariable Calculus (Graduate Student Instructor)
2005, Spring Math 1b : Calculus in One Variable II (Graduate Student Instructor)
2004, Fall Math 1a : Calculus in One Variable I (Graduate Student Instructor)

Harvard University

2003, Spring Math 123 : Abstract Algebra II (Course Assistant)
2002, Fall Math 113 : Complex Analysis (Course Assistant)
2002, Spring Math 112 : Real Analysis (Course Assistant)
2001, Fall Math 25a : Honors Advanced Multivariable Calculus (Course Assistant)
2001, Spring Math 21a : Multivariable Calculus (Course Assistant)
2000, Fall Math 21a : Multivariable Calculus (Course Assistant)