

CURRICULUM VITAE

Benjamin Bakker

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Contact Information

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Personal Information

Born March 5, 1985 in Massachusetts, USA
U.S. Citizen

Education

Princeton University, Princeton, New Jersey
Ph.D. in Mathematics, 2010
Thesis: *Hodge polynomials of moduli spaces of stable pairs on K3 surfaces*
Advisor: Rahul Pandharipande

Harvard University, Cambridge, Massachusetts
A.B. in Mathematics and Physics, 2005
Senior thesis: *Toric varieties and mirror symmetry*
Senior thesis advisor: Shing-Tung Yau

Academic Positions

2016–present Assistant Professor, University of Georgia
2014–2016 wiss. Mitarb., Humboldt-Universität zu Berlin
2011–2014 NSF Postdoctoral Fellow
2010–2013 Courant Instructor, Courant Institute NYU

Research Interests

Algebraic geometry, Hodge theory, moduli of abelian varieties, toroidal compactifications, moduli of curves, symplectic varieties, derived categories.

Awards and Honors

2017–2020 NSF Individual Research Grant
2011–2014 National Science Foundation Postdoctoral Fellowship
2006 Clay Mathematics Institute Summer School grant
2004 Phi Beta Kappa (Harvard University)
2004–2005 John Harvard Scholarship (Harvard University)
2003 Derek Bok Certificate for Distinction in Teaching (Harvard University)
2002 Detur Book Prize (Harvard University)
2000 Massachusetts AP State Scholar

Papers

On the canonical models of locally symmetric varieties,
with V. Alexeev, in preparation.

O-minimal structures on flat bundles and affine invariant manifolds,
with S. Mullane, in preparation.

The global moduli of locally trivial deformations of symplectic varieties,
with C. Lehn, in preparation.

Modularity of curves in Hilbert modular varieties,
with J. Tsimerman, in preparation.

Tame topology of arithmetic quotients and algebraicity of Hodge loci,
with B. Klingler and J. Tsimerman, in preparation.

The Ax–Schanuel conjecture for variations of Hodge structures,
with J. Tsimerman, submitted.

A global Torelli theorem for singular symplectic varieties,
with C. Lehn, submitted.

The Mercat conjecture for stable rank 2 vector bundles on generic curves,
with G. Farkas, *Amer. J. Math.*, to appear.

The geometric torsion conjecture for abelian varieties with real multiplication,
with J. Tsimerman, *J. Differential Geom.*, **109**, 3 (2018).

The Kodaira dimension of complex hyperbolic manifolds with cusps,
with J. Tsimerman, *Compos. Math.* **154**, 3 (2017).

A classification of Lagrangian planes in holomorphic symplectic varieties,
J. Inst. Math. Jussieu, **16**, 4 (2017).

p -torsion monodromy representations of elliptic curves over geometric function fields,
with J. Tsimerman, *Ann. of Math.*, 184 (2016).

On the Frey–Mazur conjecture over low genus curves, with J. Tsimerman,
arXiv preprint.

Lagrangian 4-planes in holomorphic symplectic varieties of $K3^{[4]}$ -type,
with A. Jorza, *Cent. Eur. J. Math.* **12**, 7 (2014).

Higher rank stable pairs on K3 surfaces,
with A. Jorza, *Commun. Number Theory Phys.* **6**, 4 (2012).

Hodge polynomials of moduli spaces of stable pairs on K3 surfaces,
Ph.D. thesis, Princeton University, 2010.

Invited Talks

- September 2018 Workshop on Moduli Spaces and Related Problems, Shanghai
- June 2018 AMS-CMS Joint Meetings, Fudan University, Shanghai
- May 2018 Shimura varieties and hyperbolicity of moduli spaces, UQAM, Montreal
- May 2018 Algebraic Geometry seminar, Rutgers University
- April 2018 Algebraic Geometry seminar, Northeastern University
- April 2018 Algebraic Geometry seminar, UIC
- February 2018 Algebraic Geometry seminar, UC Davis
- January 2018 Algebraic Geometry seminar, Boston College
- December 2017 Geometry seminar, Temple University
- December 2017 Algebra seminar, University of Pennsylvania
- October 2017 Algebraic geometry seminar, Princeton University
- October 2017 WAGS, UCLA
- May 2017 Geometry and Topology of Ball Quotients and Related Topics, Hunter College
- April 2017 Algebra seminar, University of Kentucky

Invited Talks (continued)

- April 2017 Mini-school on abelian and symplectic varieties, UNC Chapel Hill
March 2017 Algebraic geometry seminar, Columbia University
February 2017 Algebraic geometry seminar, UCSD
January 2017 Algebraic geometry seminar, Stanford University
November 2016 Algebraic geometry seminar, Stony Brook University
October 2016 Colloquium, University of South Carolina
October 2016 Algebra and number theory seminar, Emory University
August 2016 Geometry at the ANU, ANU
June 2016 Algebraic geometry seminar, University of Edinburgh
March 2016 Algebraic and Tropical Geometry, Yale University
March 2016 Colloquium, University of Georgia
February 2016 Colloquium, Rice University
February 2016 Algebraic geometry seminar, University of Hong Kong
January 2016 Colloquium, University of Washington
January 2016 Colloquium, University of Notre Dame
January 2016 German-Israeli Workshop in Algebraic and Tropical Geometry, Bar-Ilan University
January 2016 Colloquium, UC Irvine
December 2015 North German Algebraic Geometry Seminar, Freie Universität
December 2015 Colloquium, University of Pennsylvania
November 2015 SFB Kolloquium, Universität Mainz
October 2015 Japanese-European Symposium on Symplectic Varieties and Moduli Spaces, Kyoto University
September 2015 Algebraic geometry seminar, Northeastern University
September 2015 Algebraic geometry seminar, Courant Institute NYU
July 2015 AMS Summer Institute in Algebraic Geometry, Conference at University of Utah
June 2015 Algebraic geometry seminar, Leibniz-Universität Hannover
February 2015 Geometry and arithmetic of hyperkähler manifolds, Workshop at Leibniz-Universität
February 2015 Motivic invariants related to K3 and abelian geometries, Conference at Humboldt-Universität
January 2015 Number theory seminar, University of Toronto
January 2014 Algebraic geometry seminar, Max Planck Institut
November 2014 Algebraic geometry seminar, Humboldt-Universität Berlin
November 2014 Algebraic geometry seminar, ETH
October 2014 Current developments in moduli theory, Conference at Northeastern University
October 2014 Algebraic geometry seminar, Columbia University
September 2014 Lie groups seminar, Yale University
September 2014 Algebra seminar, University of Pennsylvania
August 2014 Recent Developments in Algebraic and Arithmetic Geometry, Conference at Rényi Institute
April 2014 Algebraic geometry preprint seminar, Columbia University
January 2014 Algebraic geometry seminar, Leibniz-Universität Hannover
January 2014 Algebraic geometry seminar, Humboldt-Universität Berlin
January 2014 Algebraic geometry seminar, University of Chicago
December 2013 Algebraic geometry seminar, Courant Institute NYU
December 2013 Algebraic geometry seminar, University of Michigan
November 2013 Holomorphic Symplectic Varieties, Lecture Series at BICMR, Peking University
November 2013 Number theory seminar, UIC
November 2013 Algebraic geometry seminar, UIUC
November 2013 Algebraic geometry seminar, University of Notre Dame
October 2013 Algebra seminar, University of Pennsylvania
September 2013 Arithmetic and Geometry of Rational Curves, Conference at Rice University
May 2013 Algebraic geometry seminar, Courant Institute
October 2012 Hyperkähler Geometry, Conference at Stony Brook University
April 2012 Algebraic geometry seminar, UMASS
January 2012 Algebraic geometry seminar, UCSD
January 2012 Algebraic geometry seminar, Caltech
October 2011 Algebraic geometry seminar, Courant Institute NYU
October 2011 Algebraic geometry seminar, Harvard/MIT

Invited Talks (continued)

June 2011	Holomorphic Symplectic Varieties, Conference at Courant Institute
November 2010	Algebraic geometry seminar, Courant Institute
October 2010	Graduate student seminar, Princeton University
September 2010	Algebraic geometry seminar, Columbia University
March 2010	Geometry, representation theory, and moduli seminar, Princeton University

Teaching Experience

2016–present	Assistant Professor, UGA Differential equations (Math 2700) (Counter)examples in char. p geometry (Math 8330) Commutative Algebra (Math 8020) Topics in Hodge theory research group (Math 8850) Differential equations (Math 2700) Abelian Varieties (Math 8330) Modern Algebra and Geometry I (Math 4000) Graduate Modern Algebra and Geometry I (Math 6000)
2014–2016	Organizer of the college seminar at Humboldt-Universität zu Berlin Nonarchimedean analytic geometry and rational points Literature seminar Faltings' Theorem Derived equivalence of abelian varieties
2010–2014	Instructor at Courant Institute, NYU Undergraduate reading course on Elementary Number Theory Graduate Algebraic Number Theory (MATH-GA 2210) Elementary Number Theory (MATH-UA 248) Graduate Algebra I (MATH-GA 2130) Graduate reading course on Complex Algebraic Curves Graduate Algebraic Topology II (Math-GA 2320) Calculus (V63.0121)
2007	Instructor at Princeton University Calculus (Math 103)
2005–2010	Teaching Assistant at Princeton University Numbers, Equations, and Proofs (Math 214) Advanced Multivariable Calculus (Math 203) Analysis in Several Variables (Math 218) Ordinary Differential Equations (Math 303) Calculus (Math 104) Multivariable Calculus (Math 201) Linear Algebra (Math 202)
2002–2005	Course Assistant at Harvard University Multivariable Calculus (Math 21a/b) Multivariable Calculus (Math 21a/b) Honors Multivariable Calculus and Linear Algebra (Math 25a) Multivariable Calculus (Math 21a/b)

Academic Services

2016–present	Co-organizer of Algebraic geometry seminar, UGA
2016–present	Co-organizer of Postdoc seminar, UGA
2017–present	Committee member for Ph.D. general examinations, UGA
2017	Co-organizer of Georgia Algebraic Geometry Symposium (GAGS), UGA
2014–2016	Organizer of College Seminar for IRTG, Humboldt-Universität
2013	Undergraduate reading course on elementary number theory, Courant Institute

Academic Services (continued)

- 2012–2013 Committee member for Ph.D. general examinations, Courant Institute
Committee member for Ph.D. defense, Courant Institute
- 2011–2012 Co-organizer of Joint Columbia-CUNY-NYU Number Theory seminar, Courant Institute
- 2011 Graduate reading course on plane algebraic curves, Courant Institute
- 2009–present Referee for: *Algebra Number Theory*, *IMRN*, *Invent. Math.*, *J. Differential Geom.*, *J. Lond. Math. Soc.*, *J. Reine Angew. Math.*, *Math. Ann.*, *Res. Math. Sci.*
NSF panelist

Languages

Fluent: English
Reading: French, German, Classical Greek

References

- **Rahul Pandharipande** (doctoral advisor)
ETH Zürich
rahul@math.ethz.ch
- **Gavril Farkas**
Humboldt-Universität zu Berlin
farkas@math.hu-berlin.de
- **Samuel Grushevsky**
Stony Brook University
sam@math.sunysb.edu
- **Chris Jankowski** (teaching reference)
Courant Institute
chrisj@cims.nyu.edu