

Joseph Rabinoff

Curriculum Vitæ

Current Position

I am a Benjamin Peirce Lecturer in Mathematics at Harvard University.

Personal Data

Address: Department of Mathematics
Harvard University
One Oxford Street
Cambridge, MA 02138

Email: rabinoff@math.harvard.edu
Web: <http://math.harvard.edu/~rabinoff/>
Citizenship: United States of America

Education

- **Stanford University**, Stanford, California.
Ph.D. in Mathematics, 2009.
Dissertation: *Higher-level canonical subgroups for p -divisible groups*.
Advisors: Brian Conrad, Ravi Vakil.
- **Harvard University**, Cambridge Massachusetts.
A.B., summa cum laude and highest honors in Mathematics, 2003.
Senior thesis: *The Bruhat-Tits building of a p -adic Chevalley group and an application to representation theory*.
Senior thesis advisor: Stephen DeBacker.

Research Interests

- Arithmetic geometry: abelian varieties, canonical subgroups, p -divisible groups, non-Archimedean analytic spaces.
- Algebraic geometry: tropical algebraic geometry, enumerative problems, tropical lifting theorems.

Teaching Experience

- 2011 **Math 21b** (Harvard University):
Taught an introductory basic linear algebra course.
- 2010 **Math 121** (Harvard University):
Taught an introductory abstract linear algebra course.
- 2010 **Math 272x** (Harvard University):
Taught a graduate topics course on p -adic modular forms and analytic continuation results.
- 2009 **Math 1a** (Harvard University):
Taught a section of a first-year single-variable calculus class.

- 2008 **Math 41** (Stanford University):
Teaching assistant for a single-variable calculus class.
- 2007 **Math 156** (Stanford University):
Course assistant for a class on the representation theory of finite groups.
- 2006 **Math 154** (Stanford University):
Taught an upper-level undergraduate course on algebraic number theory.
- 2005 **Assistant Teacher** (University of Michigan):
Taught abstract mathematics to high school students as part of the Michigan Math and Science Scholars program.
- 2003–04 **Language Assistant** (Lycée Jeanne d’Albret, St.-Germain-en-Laye, France):
Taught conversational English to French high school students.
- 2001–03 **Teaching Assistant** (Harvard University):
Responsible for leading discussion sections, grading homework, and holding office hours for the following undergraduate courses:
- Math 122: Algebra I: Theory of Groups and Vector Spaces
 - Math 123: Algebra II: Theory of Rings and Fields
 - Math 23(a,b): Linear Algebra and Real Analysis

Academic and Teaching Honors

- 2008 **G.J. Lieberman Fellow in the Natural Sciences** (Stanford University):
awarded in recognition of outstanding scholarship, teaching, university service, and demonstrated potential for leadership roles in the academic community.
- 2007 **Centennial Teaching Award** (Stanford University):
recognizes and rewards outstanding teaching by Stanford TAs in the Schools of Humanities and Sciences, Engineering, and Earth Sciences.
- 2003 **Thomas T. Hoopes Prize** (Harvard University):
awarded for outstanding scholarly work or research.
- 2002 **Phi Beta Kappa** (Harvard University).
- 2002 **Certificate for Distinction in Teaching** (Derek Bok Center, Harvard University):
awarded to outstanding teaching fellows, teaching assistants, preceptors, and lecturers each semester.
- 2001–02 **John Harvard Scholarship** (Harvard University).
- 2000 **Detur Prize** (Harvard University).

Publications and Preprints

- Brian Osserman and Joseph Rabinoff, *Lifting non-proper tropical intersections*, arXiv:1109.5733. Submitted.
- Matthew Baker, Sam Payne, and Joseph Rabinoff, *Non-Archimedean geometry, tropicalization, and metrics on curves*, arXiv:1104.0320. Submitted.
- Joseph Rabinoff, *Tropical analytic geometry, Newton polygons, and tropical intersections*, arXiv:1007.2665v1. To appear in *Advances in Mathematics*.
- Joseph Rabinoff, *Higher-level canonical subgroups for p -divisible groups*, arXiv:0910.3323v1. To appear in the *Journal of the Institute of Mathematics of Jussieu*.
- Joseph Rabinoff, *Hybrid Grids and the Homing Robot*, *Discrete Applied Mathematics* (2004) no. 140, 155–168.

Invited Talks

- 2/6/12 **University of Michigan** Group, Lie and Number Theory Seminar:
The Skeleton of the Jacobian and the Jacobian of the Skeleton.
- 2/1/12 **Harvard University** Number Theory Seminar:
The Skeleton of the Jacobian and the Jacobian of the Skeleton.
- 1/27/12 **University of Pennsylvania** Galois Seminar:
The Skeleton of the Jacobian and the Jacobian of the Skeleton.
- 1/07/12 **Joint Mathematics Meetings** Special session in arithmetic geometry:
Far beyond Newton polygons.
- 11/04/11 **Brown University** Algebraic Geometry Seminar:
Bernstein's theorem, Newton polygons, and tropical intersections.
- 10/28/11 **Stanford University** Number Theory Seminar:
Bernstein's theorem, Newton polygons, and tropical intersections.
- 10/26/11 **University of California, Berkeley** Number Theory Seminar:
Bernstein's theorem, Newton polygons, and tropical intersections.
- 05/12/11 **The Bellairs Workshop in Number Theory**:
Third nighttime lecture and fifth daytime lecture.
- 04/19/11 **Yale University** Algebra Seminar:
Tropicalization, Berkovich curves, and implicitization.
- 04/11/11 **Harvard University** Faculty Colloquium:
Implicitization via harmonic analysis on graphs, non-Archimedean analytic curves, and tropicalization.
- 03/17/11 **Georgia Institute of Technology** Algebra Seminar:
Canonical subgroups for p -divisible groups.
- 12/06/10 **Boston University** Number Theory Seminar:
Metric aspects of the tropicalization of a Berkovich curve.
- 12/02/10 **Concordia University** Québec-Vermont Number Theory Seminar:
Canonical subgroups for p -divisible groups.
- 11/19/10 **Stanford University** Algebraic Geometry Seminar:
Metric aspects of the tropicalization of a Berkovich curve.
- 11/08/10 **Northwestern University** Number Theory Seminar:
Metric aspects of the tropicalization of a Berkovich curve.
- 11/07/10 **AMS Special Session on Applications of Non-Archimedean Geometry**:
Metric aspects of the tropicalization of a Berkovich curve.
- 04/29/10 **Pennsylvania State University** Number Theory Seminar:
Canonical subgroups for abelian varieties.
- 04/16/10 **Brandeis University** Everytopic Seminar:
Canonical subgroups for abelian varieties.
- 04/13/10 **Rice University** Number Theory Seminar:
Canonical subgroups for abelian varieties.
- 03/09/10 **Amherst College** Five College Number Theory Seminar:
Canonical subgroups for abelian varieties.
- 01/11/10 **University of Michigan** Group, Lie, and Number Theory Seminar:
Canonical subgroups for p -divisible groups.

- 11/17/09 **Massachusetts Institute of Technology** Harvard-MIT Algebraic Geometry Seminar:
Tropical intersection numbers and canonical subgroups.
- 11/16/09 **Harvard University** Faculty Colloquium:
Beyond Newton polygons: locating the zeros of polynomials over a non-Archimedean field.
- 11/06/09 **University of Wisconsin at Madison** Midwest Number Theory Day:
Canonical subgroups for p -divisible groups.
- 10/26/09 **Massachusetts Institute of Technology** Number Theory Seminar:
Canonical subgroups for p -divisible groups.
- 10/12/09 **Stanford University**:
Tropical geometry as a generalization of the Newton Polygon.
- 10/08/09 **Mathematical Sciences Research Institute**:
Rigid-analytic methods in tropical geometry.
- 04/30/09 **University of California, Santa Cruz** Algebra and Number Theory Seminar:
Canonical Subgroups of Abelian Varieties.
- 02/11/09 **University of California, Berkeley** Number Theory Seminar:
Canonical Subgroups of Abelian Varieties.
- 11/14/08 **Stanford University** Algebraic Geometry Seminar:
Canonical Subgroups of Abelian Varieties.
- 11/03/07 **University of Wisconsin** Graduate Student Conference in Number Theory:
Biextensions and Duality for Formal Groups.

Other Activities

- 2011–12 **Harvard Number Theory Seminar** (Harvard University):
Co-organized the number theory seminar.
- 2010–11 **Colloquium Committee** (Harvard University):
Co-organized the joint Brandeis-Harvard-MIT-Northeastern colloquium.
- 2008–09 **Student Algebraic Geometry Seminar** (Stanford University):
Organized a weekly seminar for graduate students to give expository or research talks.
- 2005–06 **Faculty Areas of Research Seminar** (Stanford University):
Organized a weekly seminar in which Stanford faculty presented their research interests to junior graduate students.
- 2003 **Honors undergraduate thesis** (Harvard University):
The Bruhat-Tits building of a p -adic Chevalley group and an application to representation theory.
Winner, Hoopes Prize. Advised by Stephen DeBacker.
- 2002 **Research Experience for Undergraduates** (Williams College):
Minimal graphs group. Advised by Gary Lawlor.
- 2001 **Research Experience for Undergraduates** (University of Minnesota):
Wrote Hybrid Grids and the Homing Robot.

References

- **Brian Conrad** (Stanford University; *thesis advisor*):
conrad@math.stanford.edu

- **Ravi Vakil** (Stanford University; *thesis advisor*):
vakil@math.stanford.edu
- **Matt Baker** (Georgia Institute of Technology):
mbaker@math.gatech.edu
- **Walter Gubler** (Mathematisches Institut Universität Tübingen):
Walter.Gubler@uni-tuebingen.de
- **Juliana Belding** (Harvard University; *teaching reference*):
jbelding@math.harvard.edu