

Professional Preparation

Northern Arizona University

University of California at **Berkeley****Harvard University**

Mathematics, B.S. 1994

Mathematics, Ph.D. 2000

NSF postdoc, 2000–04

Appointments

- Benjamin Peirce Assistant Professor of Mathematics, Harvard University, July 2001–May 2005
- NSF Postdoctoral Research Fellowship under Barry Mazur at Harvard University, August 2000–May 2004.
- Clay Mathematics Institute Liftoff Fellow, Summer 2000.

Most Relevant Publications

- *Visible Evidence for the Birch and Swinnerton-Dyer Conjecture for Rank 0 Modular Abelian Varieties* (31 pages), with A. Agashe, to appear in *Mathematics of Computation*.
- *Visibility of Shafarevich-Tate Groups of Abelian Varieties*, (19 pages), with A. Agashe, *J. Number Theory*, **97** (2002), no. 1, 171–185.
- *Studying the Birch and Swinnerton-Dyer Conjecture for Modular Abelian Varieties Using MAGMA* (22 pages), to appear as a chapter in the Springer-Verlag book “Computational Experiments in Algebra and Geometry”.
- *Constructing Elements in Shafarevich-Tate Groups of Modular Motives*, (19 pages) with N. Dummigan and M. Watkins, to appear in “Number theory and algebraic geometry—to Peter Swinnerton-Dyer on his 75th birthday”, Ed. by M. Reid and A. Skorobogatov.
- *$J_1(p)$ Has Connected Fibers* (77 pages), with B. Conrad and S. Edixhoven, to appear in *Documenta Mathematica*.

Other Publications

- *Shafarevich-Tate Groups of Nonsquare Order* (13 pages), to appear in the Barcelona MCAV proceedings, Ed. by Jordi Quer.
- *Mod 5 Approaches to Modularity of Icosahedral Galois Representations* (18 pages), with K. Buzzard, *Pacific J. Math*, **203** (2002), no. 2, 265–282.

- *There are Genus One Curves over \mathbf{Q} of Every Odd Index* (9 pages), *J. Reine Angew. Math. (Crelle's Journal)*, **547** (2002), 139–147.
- *Component Groups of Purely Toric Quotients of Semistable Jacobians*, (20 pages), with B. Conrad, *Math. Res. Lett.*, **8** (2001), no. 5-6, 745–766.
- *The Field Generated by the Points of Small Prime Order on an Elliptic Curve* (7 pages), with L. Merel, *Internat. Math. Res. Notices* (2001), no. 20, 1075–1082.

Synergistic Activities

- **Databases:** Created and maintain the Modular Forms Database. This is over 40GB of continually expanding data about modular forms and abelian varieties, which is freely available online:

<http://modular.fas.harvard.edu/Tables/>.

- **Research Tools:** Author of the modular forms and modular symbols parts of the MAGMA computer algebra system (425 pages (26000 lines) of code plus documentation). This is a tool used by mathematicians who do computations with modular forms.
- **Outside Service:** Defense Science Study Group member 2002–2003: DSSG is a DARPA funded program administered by the Institute for Defense Analysis; wrote classified paper on GPS vulnerabilities.
- **Outreach:** Canada/USA MathCamp mentor (2002); Several Math Circles talks in Boston; Guest speaker at Harvard/MIT math competition (2001).

Collaborators and Other Affiliations

- **Coauthors:** A. Agashe (Univ. of Missouri), K. Buzzard (Imperial College, London), R. Coleman (UC Berkeley), B. Conrad (Univ. of Michigan), N. Dummigan (Sheffield, UK), S. Edixhoven (Leiden, Netherlands), F. Leprévost (Univ. Joseph Fourier, Technische Univ. Berlin), E. V. Flynn (Liverpool, UK), D. Kohel (Univ. of Sydney), L. Merel (Paris 6), K. Ribet (UC Berkeley), E. F. Schaefer (Santa Clara Univ.), M. Stoll (Inter. Univ. Bremen, Germany), H. A. Verrill (Louisiana State), M. Watkins (Penn. State Univ.), J. L. Wetherell (CCR, San Diego)
- **Graduate and Postdoctoral Advisors:**
 - **Ph.D. adviser:** Hendrik Lenstra, University of Leiden, Netherlands.
 - **NSF Postdoctoral adviser:** Barry Mazur, Harvard University.
- **Thesis:** Advised three undergraduate thesis at Harvard.