

- Employment**
- **UC San Diego:** Assoc. Prof. of Mathematics (tenured), 2005–present.
 - **Harvard:** Benjamin Peirce Asst. Prof. of Mathematics, 2001–2005.
 - **Harvard:** NSF Postdoctoral Fellow, 2000–2004.
 - Consultant for the Institute for Defense Analysis, 2002–present.
- Education**
- **University of California at Berkeley,** Ph.D. in Mathematics, 2000, *Explicit Approaches to Modular Abelian Varieties*, under H. W. Lenstra.
 - **Northern Arizona University,** B.S. in Mathematics, 1994.
- Grants**
- **NSF Grant,** DMS-0400386, 2004–present.
 - **Sun Academic Education Grant** (\$70K Sun Fire V480 server), 2003.
 - From W. R. Hearst III and Harvard (\$20K for 12 Processor Cluster), 2002.
 - Clay Mathematics Institute Liftoff Fellowship, Summer 2000.
 - Berkeley Vice Chancellor Research Grant (6 Processor Cluster), 1999.
- Publications**
1. *The Modular Degree, Congruence Primes and Multiplicity One*, with A. Agashe and K. Ribet (16 pages), 2005, submitted.
 2. *Computation of p -Adic Heights and Log Convergence*, with B. Mazur and J. Tate (32 pages), 2005, submitted.
 3. *Verification of the Birch and Swinnerton-Dyer Conjecture for Specific Elliptic Curves*, with G. Grigorov, A. Jorza, S. Patrikis, and C. Patrascu (26 pages), 2005, submitted.
 4. *Visibility of Mordell-Weil Groups* (20 pages), 2005, submitted.
 5. *SAGE: System for Algebra and Geometry Experimentation* with D. Joyner, (3 pages), to appear in the SIGSAM Bulletin.
 6. *Modular Parametrizations of Neumann-Setzer Elliptic Curves*, with M. Watkins, in IMRN 2004, no. 27, 1395–1405.
 7. *Studying the Birch and Swinnerton-Dyer Conjecture for Modular Abelian Varieties Using MAGMA* (23 pages), to appear in a Springer-Verlag book edited by J. Cannon and W. Bosma.
 8. *Conjectures about Discriminants of Hecke Algebras of Prime Level* (16 pages), with F. Calegari, in ANTS VI, Vermont, 2004.
 9. *Constructing Elements in Shafarevich-Tate Groups of Modular Motives*, with N. Dummigan and M. Watkins, in “Number theory and algebraic geometry—to Peter Swinnerton-Dyer on his 75th birthday”, Ed. M. Reid and A. Skorobogatov, pages 91–118.
 10. *Approximation of Infinite Slope Modular Eigenforms By Finite Slope Eigenforms* (13 pages), with R. Coleman, in the Dwork Proceedings.
 11. *$J_1(p)$ has connected fibers*, with B. Conrad and B. Edixhoven, Documenta Mathematica, **8** (2003), 331–408.

12. *Shafarevich-Tate Groups of Nonsquare Order*, in *Progress in Math.*, **224** (2004), 277–289, Birkhauser.
13. *Visible Evidence for the Birch and Swinnerton-Dyer Conjecture for Rank 0 Modular Abelian Varieties* (30 pages), with A. Agashe, appeared in *Mathematics of Computation*.
14. *A Database of Elliptic Curves—First Report* (10 pages) with M. Watkins, in ANTS V proceedings, Sydney, Australia, 2002.
15. *Visibility of Shafarevich-Tate Groups of Abelian Varieties*, with A. Agashe, *J. Number Theory*, **97** (2002), no. 1, 171–185.
16. *Cuspidal Modular Symbols are Transportable*, with H. Verrill, *LMS J. Comput. Math.*, **4** (2001), 170–181.
17. Appendix to Lario and Schoof’s *Some computations with Hecke rings and deformation rings*, with A. Agashe, *Experiment. Math.* **11** (2002), no. 2, 303–311.
18. *There are genus one curves over \mathbf{Q} of every odd index*, *J. Reine Angew. Math.* **547** (2002), 139–147.
19. *Component groups of purely toric quotients of semistable Jacobians*, with B. Conrad, *Math. Res. Lett.*, **8** (2001), no. 5–6, 745–766.
20. *The field generated by the points of small prime order on an elliptic curve*, with L. Merel, *Int. Math. Res. Notices*, 2001, no. 20, 1075–1082.
21. *An introduction to computing modular forms using modular symbols* (10 pages), to appear in an MSRI proceedings volume.
22. *A mod five approach to modularity of icosahedral Galois representations*, with K. Buzzard, *Pac. J. Math.*, **203** (2002), no. 2, 265–282.
23. *Lectures on Serre’s conjectures*, with K. A. Ribet, in *Arithmetic Algebraic Geometry*, IAS/Park City Math. Inst. Series, Vol. 9, 143–232.
24. *Component groups of quotients of $J_0(N)$* , with D. Kohel, *Proceedings of the 4th International Symposium (ANTS-IV)*, 2000, 405–412.
25. *Empirical evidence for the Birch and Swinnerton-Dyer conjectures for modular Jacobians of genus 2 curves*, with E. V. Flynn, F. Leprévost, E. F. Schaefer, M. Stoll, J. L. Wetherell, *Math. of Comp.* **70** (2001), no. 236, 1675–1697.

Books

1. *Algorithms for Computing with Modular Forms*, (150 pages), under contract for the AMS Graduate Studies in Mathematics series.
2. *Elementary Number Theory* (185 pages), under contract for the Springer-Verlag UTM series, <http://modular.fas.harvard.edu/ent/>.
3. *A Brief Introduction to Classical and Adelic Algebraic Number Theory* (190 pages), <http://modular.fas.harvard.edu/papers/ant/>.

4. *Lectures on Modular Forms and Galois Representations* (200 pages), with K. A. Ribet, intended for Springer-Verlag's (in progress).

Computation

- Primary author of the System for Algebra and Geometry Experimentation (SAGE): <http://sage.sourceforge.net/>.
- The modular forms, modular symbols, and modular abelian varieties parts of Magma (three visits to Sydney, Australia, and over 25000 lines of code.)
- Modular Forms Database: <http://modular.fas.harvard.edu/tables/>.
- Extensive experience with Python, C/C++, Magma, Linux, and administering clusters of high-performance computers with many users.

Teaching

UC San Diego

- *Introduction to Computing with Modular Forms*, Fall 2005.

Harvard University

- *Freshman Seminar on Fermat's Last Theorem*, Fall 2004.
- *Computing With Modular Forms*, Fall 2004.
- *Algebraic Number Theory*, Spring 2004.
- *Modular Abelian Varieties*, Fall 2003.
- *Freshman Seminar on Elliptic Curves*, Spring 2003.
- *Elementary Number Theory*, Fall 2001 and Fall 2002.
- *Linear Algebra*, Fall 2001 and Spring 2002.
- Advised 6 senior honors theses.
- Directed 8 funded undergraduate research projects.
- Participated in first *Clay Mathematics Research Academy*, 2001.
- Seminar Organization:
 - *The Basic Notions Seminar*, 2003–present.
 - *The Modular Curves Seminar*, 2000–present.
 - *Harvard Colloquium*, 2001–2002.

IAS/Park City Mathematics Institute

- *Teaching Assistant*, Summer 1999, K. Ribet's course on Serre's conjectures.

University of California at Berkeley

- *Curriculum Development*, 1997–1998, wrote instructional software.
- *Discrete Mathematics*, Summer 1997.
- *Calculus*, Fall 1995–Spring 1997, teaching assistant.

Northern Arizona University

- *College Mathematics With Applications*, Spring 1995.
- *College Algebra*, Fall 1994.

Seminars

During the last year I gave invited talks at Caltech, ASU, The Lenstra Treur-

feest at MSRI, University of Georgia, University of Sydney, Microsoft Research, UC Berkeley, Princeton University, CUNY, CCR Princeton, Penn State, Johns Hopkins, UCONN, UIUC, and Brown University. For a more complete list, see <http://modular.fas.harvard.edu/schedule/>.

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References

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