William A. Stein — *Curriculum Vitae*

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Employment

- **Harvard**: Benjamin Peirce Asst. Professor of Mathematics, 2001–present.
- **Harvard**: NSF Postdoctoral Fellow, 2000–2004.
- Consultant for the Inst. for Defense Analysis (Cryptography), 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. *Modular Parametrizations of Neumann-Setzer Elliptic Curves*, with M. Watkins, in IMRN 2004, no. 27, 1395–1405.
2. *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.
3. *Conjectures about Discriminants of Hecke Algebras of Prime Level* (16 pages), with F. Calegari, in ANTS VI, Vermont, 2004.
4. *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.
5. *Approximation of Infinite Slope Modular Eigenforms By Finite Slope Eigenforms* (13 pages), with R. Coleman, in the Dwork Proceedings.
6. *$J_1(p)$ has connected fibers*, with B. Conrad and B. Edixhoven, Documenta Mathematica, **8** (2003), 331–408.
7. *Shafarevich-Tate Groups of Nonsquare Order*, in Progress in Math., **224** (2004), 277–289, Birkhauser.
8. *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.
9. *A Database of Elliptic Curves–First Report* (10 pages) with M. Watkins, in ANTS V proceedings, Sydney, Australia, 2002.
10. *Visibility of Shafarevich-Tate Groups of Abelian Varieties*, with A. Agashe, J. Number Theory, **97** (2002), no. 1, 171–185.
11. *Cuspidal Modular Symbols are Transportable*, with H. Verrill, LMS J. Comput. Math., **4** (2001), 170–181.

12. 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.
13. *There are genus one curves over* $\mathbf{Q}$ *of every odd index*, J. Reine Angew. Math. **547** (2002), 139–147.
14. *Component groups of purely toric quotients of semistable Jacobians*, with B. Conrad, Math. Res. Lett., **8** (2001), no. 5–6, 745–766.
15. *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.
16. *An introduction to computing modular forms using modular symbols* (10 pages), to appear in an MSRI proceedings volume.
17. *A mod five approach to modularity of icosahedral Galois representations*, with K. Buzzard, Pac. J. Math., **203** (2002), no. 2, 265–282.
18. *Lectures on Serre's conjectures*, with K. A. Ribet, in Arithmetic Algebraic Geometry, IAS/Park City Math. Inst. Series, Vol. 9, 143–232.
19. *Component groups of quotients of* $J_0(N)$, with D. Kohel, Proceedings of the 4th International Symposium (ANTS-IV), 2000, 405–412.
20. *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. *Elementary Number Theory* (185 pages), under contract for the Springer-Verlag UTM series, `http://modular.fas.harvard.edu/ent/`.
2. *A Brief Introduction to Classical and Adelic Algebraic Number Theory* (190 pages), `http://modular.fas.harvard.edu/papers/ant/`.
3. *Lectures on Modular Forms and Galois Representations* (200 pages), with K. A. Ribet, intended for Springer-Verlag's (in progress).

Computing

- 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++, MAGMA, Linux, and administering over a dozen high-performance computers with many users.

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Teaching

Harvard University

- *Freshman Seminar on Fermat's Last Theorem*, Fall 2004.
- *Computing With Modular Forms*, graduate course, Fall 2004.
- *Algebraic Number Theory*, undergraduate course, Spring 2004.
- *Modular Abelian Varieties*, graduate course, 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 Treurfeest 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/`.

Personal

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References

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