

Glenn Stevens

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Education

Ph.D., Mathematics, Harvard University; 1975-1980.

Georg August Universität, Göttingen, West Germany; 1974-75.

B.A., University of California, Santa Barbara, California; 1971-74.

Current Position

Professor of Mathematics; Boston University, Boston, MA; 1993-present.

Chair of the Department of Mathematics and Statistics; Boston University, Boston, MA; 2020-2024.

Associate Professor of Mathematics; Boston University, Boston, MA; 1988-1993.

Assistant Professor of Mathematics; Boston University, Boston, MA; 1984-1987.

The PROMYS Program

Founder (in 1989, w. David Fried) and director of the PROMYS program (Program in Mathematics for Young Scientists) at Boston University. This is a six week program for high school students with exceptionally strong mathematical interest, and their teachers.

PROMYS Europe

Founder (in 2014) and director of PROMYS Europe at Oxford University. This is a partnership of PROMYS, the Clay Mathematics Institute, the Mathematical Institute at Oxford, and Wadham College of Oxford University. It is a six week program for high school students in Europe, modeled on PROMYS at Boston University.

PROMYS India

Cofounder (with Ila Varma of the University of Toronto). PROMYS India is a partnership of PROMYS, and Asia Partners, a multinational corporation centered in Singapore and founded by the Nash Family. PROMYS India is scheduled to open at the Indian Institute of Science in Bangalore in the summer of 2023, or as soon as practical given the global pandemic. It will be a six week program for high school students in India, modeled on PROMYS at Boston University.

The Focus on Mathematics Partnership

Principal Investigator of the Focus on Math Partnership (FoM), a partnership of mathematicians, teachers, and education professionals to enhance student achievement. Inspired by the PROMYS for Teachers program, FoM is a collaboration led by Boston University and the Education Development Center, and joined by seven school districts, and two other universities. The partnership has been supported by three National Science Foundations grants beginning in 2003 and ending in 2017.

Other Teaching Experience

University of Padova, Italy; Visiting Professor of Mathematics; Graduate Seminar: “ p -Adic Zeta Functions and the Main Conjecture of Iwasawa Theory”; April-May, 2018.

Brown University, Providence, Rhode Island; Visiting Associate Professor of Mathematics; Spring 1989.

Rutgers University, New Brunswick, NJ; Hill Assistant Professor of Mathematics; 1981-84.

Brandeis University, Waltham, MA; Visiting Assistant Professor of Mathematics; 1980-81.

Other Professional Experience

Visiting Professor at the Simion Stoilow Institute of Mathematics in Bucharest; June 8-June 24, 2018.

Visiting Professor at the University of Padova, April 5, 2019 to June 1, 2018.

Visiting Professor at the Massachusetts Institute of Technology, September 2017 to April 2018.

Invited Professor at the University of Paris VII, May, 2003.

Invited Professor at the University of Paris XIII, June, 2003.

Research Professor, Institut Henri Poincaré, Paris. May, 2000.

Research Professor, Mathematical Sciences Research Institute, Berkeley, CA. 1995-96.

Mathematical Sciences Research Institute, Berkeley, CA. Spring, 1991.

Mathematical Sciences Research Institute, Berkeley, CA. January and March, 1987.

Harvard University, Cambridge, MA. Visitor. February and April-August, 1987.

Harvard University, Cambridge, MA. Visitor. 1985-86.

Institute for Advanced Study, Princeton, NJ. Spring, 1985.

Major Fields of Research

Number theory, Automorphic forms, Arithmetic algebraic geometry

Conferences Organized

1. August 2013: CMI-PROMYS Workshop: Developing Exceptional Talent in Mathematics. Held at Oxford University. (Principal organizer, with organizing committee: Nicholas Woodhouse (Clay Mathematics Institute, Oxford), Jürg Kramer (Humboldt Universität, Berlin), Dierk Schleicher (Jacobs University, Bremen), David Conlon (Oxford University), and Joshua Greene (COMAC, London))
2. August 1995: International Conference on Fermat’s Last Theorem. Held at Boston University. (Co-organized with Gary Cornell and Joseph Silverman)
3. June 1991: p -Adic Monodromy and the Birch-Swinnerton-Dyer conjecture. Held at Boston University. (Co-organized with Barry Mazur)

Awards and Special Recognition

Fellow of the American Mathematical Society, class of 2016

Conference on p -Adic Variation in Number Theory in honor of my 60th birthday, Boston University (June 2-6, 2014).

U.S. Presidential Scholars, Teacher Recognition Award (2005).

Research Professorship at MSRI (1995-96).

National Science Foundation Postdoctoral Fellow (1985-89).

National Science Foundation Graduate Fellow (1975-78).

Deutscher Akademischer Austauschdienst Stipendiat (1974-75), Georg August Universität, Göttingen.

Westinghouse Science Talent Search Finalist (1971).

Professional Societies

American Mathematical Society

Mathematical Association of America

National Council of Teachers of Mathematics

Board Memberships

Founding Member, Board of Trustees, The PROMYS Foundation: 2011–present.

Founding Member, Board of Directors: PROMYS India: 2018–present.

Founding Member, Board of Directors: PROMYS Europe: 2014–present.

Founding President of the Board of Directors: Math for America Boston: 2009–2021.

Founding President of the Board of Trustees, The PROMYS Foundation: 2011 – 2018

Advisory Board, Institute for Mathematics and Education, Tucson, AZ: 2006–2012.

Advisory Board, Center for Mathematics Education Mathematical Practices Study: 2009–2013.

Advisory Board, NSF DR-K12: Community for Advancing Research in Education (CADRE): 2009–2011.

Advisory Board, Center for Mathematics Education: 2006–2014.

Advisory Board, Arizona Teacher Institute MSP (Daniel Madden, PI): 2006–2012.

Advisory Board, Linear Algebra Project (Al Cuoco, PI): 2007–2012.

Other Professional Service

Member, Mary Dolciani Award Committee of the Mathematical Association of America (2016-2019).

Chair, Arnold Ross Lecture Series Committee of the American Mathematical Society (2005-06, 2016).

Member (2004-06, 2014-16, 2021-present).

Chair, Common Core Mathematics Review Panel. Appointed by the Massachusetts Commissioner of Elementary and Secondary Education (Spring, 2010).

Journals Refereed

American Journal of Mathematics, Annales de l'École Normale Supérieure, Annales de l'Institut Fourier, Asterisque, Commentare Helvetica, Compositio Mathematica, Duke Mathematics Journal, Inventiones Mathematicae, Israel Journal of Mathematics, Journal für die Reine und Angewandte Mathematik, Journal of Algebraic Geometry, Journal of the American Mathematical Society, Journal of Experimental Mathematics, Journal of Number Theory, Journal of the London Mathematical Society, London Mathematical Society Journal of Computation and Mathematics, Manuscripta Mathematica, Mathematics of Computation, Mathematische Annalen, Mathematische Zeitschrift, Proceedings of the Royal Canadian

Mathematical Society, Rocky Mountain Journal of Mathematics, Transactions of the American Mathematical Society.

Research Grants

2000–04; NSF Mathematical Sciences: Arithmetic of L -values.
1997–00: NSF Mathematical Sciences: Arithmetic of L -values.
1995–96: NSF Special Projects: Conference on Fermat’s Last Theorem.
1995–96: NSA Special Projects: Conference on Fermat’s Last Theorem.
1995–96: Vaughn Foundation: Conference on Fermat’s Last Theorem.
1994–97: NSF Mathematical Sciences: Arithmetic of L -values.
1991–94: NSF Mathematical Sciences: Arithmetic of L -values.
1991–92: NSF Special Projects: p -Adic Monodromy and the Birch-Swinnerton-Dyer conjecture.
1991–92: Mathematics Trust: p -Adic Monodromy and the Birch-Swinnerton-Dyer conjecture.
1989–91: NSF Mathematical Sciences: Arithmetic of L -values.
1985–89: NSF Postdoctoral Fellowship.
1982–84: NSF Mathematical Sciences: Congruences for special values of L -functions.

Mathematics and Education Grants

2012–present: PROMYS Foundation: Program in Mathematics for Young Scientists (PI/co-PI)
1999–present: AMS Epsilon Fund: Program in Mathematics for Young Scientists (PI/co-PI)
2019–22: NSA Special Projects: Program in Mathematics for Young Scientists (PI)
2019–21: Linde Family Foundation grant, PROMYS Math Circles (PI)
2019–20: Irving Foundation: PROMYS Math Circles (co-PI)
1999–21: Clay Mathematics Institute: Program in Mathematics for Young Scientists (PI)
2014–21: Clay Mathematics Institute: PROMYS Europe (PI)
2018–19: MAA Tensor Grant: PROMYS Math Circle Girls Initiative (co-PI)
2012–18: NSF DRK-12: Assessing Secondary Teachers Algebraic Habits of Mind (PI)
2016–18: Linde Family Foundation grant, PROMYS Math Circles (PI)
1999–16: NSA Special Projects: Program in Mathematics for Young Scientists. (PI)
2009–15: NSF DUE: Math for America Boston, Scholars (co-PI)
2008–15: Linde Family Foundation grant, Program in Mathematics for Young Scientists (PI)
2012–14: Clay Mathematics Institute/PROMYS International Alliance (PI)
2009–13: NSF MSP: Focus on Mathematics, Phase II (PI)
2003–13: NSF MSP: Focus on Mathematics (PI)
2007–13: Stephen Bechtel, Immersion Institute in Physics (co-PI).
2008–12: Massachusetts Title IIB, Mathematical Experiences (PI)
2007–12: NSF DUE, BU’s Noyce Scholars Program (co-PI)
2008–11: Mass Regents, Inquiring Minds – Immersion in Green Energy (PI)

- 1999–11: Park City Math Institute: PROMYS for Teachers (PI)
 1999–03: NSF Teacher Enhancement: PROMYS for Teachers (PI)
 1989–97: NSF Young Scholars Program: Program in Mathematics for Young Scientists (PI)

Research

Publications

Books in Mathematics

1. *Modular Forms and Fermat's Last Theorem* (edited with Gary Cornell and Joe Silverman). Springer-Verlag New York, Inc., New York, 1997, xix + 582 pp.
2. *p-Adic Monodromy and the Birch-Swinnerton-Dyer Conjecture* (edited with B. Mazur). Proceedings of the 1991 workshop held at Boston University. *Contemporary Mathematics* **165**, American Mathematical Society, Providence, Rhode Island, 1994.
3. *Arithmetic on Modular Curves*, Progress in Mathematics **20**. Boston: Birkhäuser 1982.

Books in Mathematics Education

4. *Fractions: To Be Continued*, (with Bowen Kerins, Darryl Yong, and Al Cuoco). *American Mathematical Society*; the IAS/PCMI Teacher Program Series. Volume 8; 2021; 126 pp.
5. *Fractions, Tiling, and Geometry*, (with Bowen Kerins, Darryl Yong, Al Cuoco, and Mary Pilgrim). *American Mathematical Society*; the IAS/PCMI Teacher Program Series. Volume 7; 2017; 157 pp.
6. *Probability and Games*, (with Bowen Kerins, Darryl Yong, Al Cuoco, and Mary Pilgrim). *American Mathematical Society*; the IAS/PCMI Teacher Program Series. Volume 6; 2017; 137 pp.
7. *Moving Things Around*, (with Bowen Kerins, Darryl Yong, Al Cuoco, and Mary Pilgrim). *American Mathematical Society*; the IAS/PCMI Teacher Program Series. Volume 5; 2016; 134 pp.
8. *Some Applications of Geometric Thinking*, (with Bowen Kerins, Darryl Yong, Al Cuoco, and Mary Pilgrim). *American Mathematical Society*; the IAS/PCMI Teacher Program Series. Volume 4; 2016; 221 pp.
9. *Famous Functions in Number Theory*, (with Bowen Kerins, Darryl Yong, and Al Cuoco). *American Mathematical Society*; the IAS/PCMI Teacher Program Series. Volume 3; 2015; 203 pp.
10. *Applications of Algebra and Geometry to the Work of Teaching*, (with Bowen Kerins, Benjamin Sinwell, Darryl Yong, and Al Cuoco). *American Mathematical Society*; the IAS/PCMI Teacher Program Series. Volume 2; 2015; 187 pp.
11. *Probability Through Algebra*, (with Bowen Kerins, Benjamin Sinwell, Darryl Yong, and Al Cuoco). *American Mathematical Society*; the IAS/PCMI Teacher Program Series. Volume 1; 2015; 157 pp.

Published Papers

12. Modular Symbols with Values in Beilinson-Kato Distributions (w. C. Busuioc, J. Park, and O. Patashnick). ArXiv:2311.14620v1 [math.NT] 24 Nov 2023. Submitted to *Transactions of the American Mathematical Society*.
13. A 0.5 (half) overconvergent Eichler-Shimura Isomorphism (w. F. Andreatta and A. Iovita). *Annales mathématiques du Québec*. **40** (2016), no. 1, 121-148.

14. Joining Forces in International Mathematics Outreach Efforts, (w. D. White, A. Pantano, et al). *Notices of the American Mathematical Society*. **63** (2016), no. 9, 1042-1049.
15. Overconvergent Eichler-Shimura isomorphisms, (w. F. Andreatta and A. Iovita). *Journal of the Institute of Mathematics of Jussieu*. **14** (2015), no. 2, 221-274. Published online, January 2014. See also *Arxiv:1303.4878 [math.NT]*.
16. Operationalizing and Measuring Secondary Teacher's Mathematical Habits of Mind, (w. R. Matsuura, S. Sword, A. Cuoco, and M. Gates). Submitted for publication to the *Journal for Research in Mathematics Education*.
17. Framing and measuring mathematical habits of mind: A component of mathematical knowledge for teaching, (w. R. Matsuura, S. Sword, R. Faux, M. Gates, A. Cuoco, and M. Piechem). Submitted for publication.
18. Secondary teachers' mathematical habits of mind: A Paper and Pencil Assessment, (w. S. Sword, R. Matsuura, M. Gates, J. Kang, and A. Cuoco). *Annual Perspectives in Mathematics Education: Assessment to Enhance Learning and Teaching*, (ed. C. Suurtamm), Reston, VA: NCTM, 109-118.
19. Overconvergent modular sheaves and modular forms for GL_2/F , (w. F. Andreatta and A. Iovita). *Israel J. Math.* **201** (2014), no. 1, 299-359.
20. Mathematical Habits of Mind for Teaching: Using Language in Algebra Classrooms, (w. R. Matsuura, S. Sword, M. B. Peachan, and A. Cuoco). *The Mathematical Enthusiast* **vol 10, no. 3** (2013), p. 735-776.
21. Critical Slope p -Adic L -Functions, (w. R. Pollack). *J. London Math. Soc.*, (2) **87** (2013), no. 2, 428-452.
22. Overconvergent modular symbols and p -adic L -functions, (with R. Pollack). *Ann. Scient. Éc. Norm. Sup.* 4^e série, t. 44, (2011), p. 1 à 42.
23. Coleman's $\mathcal{L}$ -invariant and families of modular forms, *Astérisque* **331** (2010), p.1-12.
24. Building a community of mathematicians and teachers. In *MER Forum*. (with A. Cuoco).
25. Rigidity of p -adic cohomology classes of congruence subgroups of $GL(N, \mathbf{Z})$. (with A. Ash, and D. Pollack). *Proc. London Math. Soc.* 2007.
26. Overview of the proof of Fermat's Last Theorem. In *Modular Forms and Fermat's Last Theorem* (eds. Glenn Stevens, Gary Cornell and Joe Silverman). Springer-Verlag New York, Inc., New York, 1997.
27. p -Adic deformations of cohomology classes of subgroups of $GL(n, \mathbf{Z})$. (with Avner Ash). *Collect. Math.* **48** (1997), 1-30.
28. Numerical experiments on families of p -adic modular forms. (with R. Coleman, and J. Teitelbaum). Computational perspectives on number theory (Chicago, IL, 1995), 143-158, *AMS/IP Stud. Adv. Math.* **7**, Amer. Math. Soc., Providence, RI, 1998.
29. Λ -adic modular forms of half-integral weight and a p -adic Shintani lifting. *AMS Contemporary Mathematics* **174** (1994), 129-152.
30. p -adic L -functions and p -adic periods of modular forms (with Ralph Greenberg). *Invent. Math.* **111**, 407-447 (1993).
31. On the conjecture of Mazur, Tate, and Teitelbaum (with Ralph Greenberg). In *p -adic Monodromy and the Birch-Swinnerton-Dyer Conjecture*. (edited with B. Mazur). Proceedings of the 1991 workshop held at Boston University. *Contemporary Mathematics* **165**, 183-211 (1994).
32. Stickelberger elements and modular parametrizations of elliptic curves. *Invent. Math.* **98**, 75-106 (1989).

33. The Eisenstein measure and real quadratic fields. in *Proceedings of the International Conference on Number Theory*, Université Laval, Quebec, 1987. Walter de Gruyter, Berlin, 1989.
34. Modular elliptic curves and values of L -functions. *C. R. Math. Rep. Acad. Sci. Canada* **X**, No. 4, 181-185 (1988).
35. On the periods of modular elliptic curves. *C. R. Math. Rep. Acad. Sci. Canada* **X**, No. 5, 211-215 (1988).
36. Poincaré series on $GL(r)$ and Kloostermann sums. *Math. Ann.* **277**, 25-51 (1987).
37. Cohomology of arithmetic groups and congruences between systems of Hecke eigenvalues. (With A. Ash), *J. Reine Angew. Math.* **365**, 192-220 (1986).
38. Modular forms in characteristic ℓ and special values of their L -functions. (With A. Ash). *Duke Math. Journal* **53**, No. 3, 849-868 (1986).
39. The cuspidal group and special values of L -functions. *Trans. A.M.S.* **291**, 519-550 (1985).
40. Terminal quotient singularities in dimensions three and four. (With D.R. Morrison), *Proc. AMS* **90**, No.1, 15-20 (1984).
41. Special values of L -functions attached to $X_1(N)$. (With S. Kamienny), *Compositio Math.* **49**, 121-142 (1983).
42. Learning in the Spirit of Exploration: PROMYS for Teachers. *MER Forum*, **13** No. 3 (2001), 7-10.

Book Review

43. *Elementary theory of L -functions and Eisenstein series*, by Haruzo Hida, London Mathematical Society Student Texts **26**, Cambridge University Press, Cambridge, 1993, x + 386 pp., ISBN 0-521-43411-4 (hardback), ISBN 0-521-43569-2 (paperback). (Reviewed in the Bulletin of the AMS)

Preprints and Works in Progress

44. Milnor K -Theory and the Universal Dedekind-Eisenstein Symbol. 2023 Preprint (w. J. Park).
45. Lower bounds for dimensions of eigenvarieties for reductive groups. 2008 preprint.
46. p -Adic Deformations of Cohomology Classes of subgroups of $GL(N, \mathbf{Z})$: The Non-ordinary Case. 2005 preprint (w. A. Ash).
47. Overconvergent modular symbols. 1998 preprint.
48. A Geometric Jacquet-Langlands correspondence. Preprint (w. M. Harris and A. Iovita).
49. p -Adic Slope Decompositions. Preprint (w. A. Ash)
50. Analytic Families of Overconvergent Modular Symbols. In preparation.

Invited Lectures and Presentations

1. January 16, 2020. (20-minute presentation) Joint Mathematics Meetings in Denver: Special Session on Organizing and Sustaining an Outreach Program; *PROMYS Math Circle: A Case Study* (w. Demi Dubois, Li-Mei Lim.).
2. June 24, 2019. (55-minute Lecture) Boston University/Keio University Workshop in Number Theory; *K-theory, Modular Symbols, and Iwasawa Theory*.

3. March 13-20, 2019. (Short video presentation) Innovations in STEM Education, NSF 2019 STEM For All Video Showcase: *Assessing Teachers' Mathematical Habits of Mind and Designing for Equity by Thinking about Mathematics* (w. Dr. Li-Mei Lim, and Demi Dubois).
4. February 24, 2019. (30-minute presentation) Simons Center, SUNY Stony Brook: Roundtable for Math and Science Summer Programs; *Creating an Ecosystem* (w. Demi Dubois, Li-Mei Lim.).
5. June 7, 2018. A 60 minute lecture to the conference *Mathematics is a long conversation: a celebration of Barry Mazur* at Harvard University, June 2-8, 2018; *Modular Symbols, K-theory, and Eisenstein Cohomology*.
6. April 10, 2018. Colloquium to the Department of Mathematics at the University of Padova; *p-Adic Variation in the Theory of Automorphic Forms*.
7. March 1, 2018. Colloque des sciences mathématiques du Québec at Université Lavale in Quebec City; *p-Adic Variation in the Theory of Automorphic Forms*.
8. January 8, 2018. Number theory seminar talk at the Tata Institute of Fundamental Research (TIFR) in Mumbai; *K-theory and Modular Symbols in Iwasawa Theory*.
9. January 6, 2018. A 60 minute lecture to a large high school audience to introduce PROMYS to the Indian Institute of Science Education and Research (IISER) at Pune; *Connecting the Dots: Mathematics and the Art of Extrapolation*.
10. January 3, 2018. A 45 minute presentation to introduce PROMYS to the Institute of Mathematical Sciences (IMSc) at Chennai; *PROMYS India: The Program in Mathematics for Young Scientists* (with Ila Varma).
11. January 2, 2018. A 45 minute presentation to introduce PROMYS to the Chennai Mathematical Institute (CMI); *PROMYS India: The Program in Mathematics for Young Scientists* (with Ila Varma).
12. October 10, 2017. Number theory seminar at the Massachusetts Institute of Technology; *K-theory, Modular Symbols, and Iwasawa Theory*.
13. June 16, 2017. A 60 minute lecture to the 60th Anniversary Ross-Reunion Conference; *Connecting the Dots: Mathematics and the Art of Extrapolation*.
14. April 13, 2016. A 90 minute presentation at the National Council of Teachers of Mathematics meeting, held in Oakland, CA; *From the classroom to assessment and back again*. (w. Ryota Matsuura, Sarah Sword, Miriam Gates, and Al Cuoco).
15. March 20, 2016. A 20 minute presentation at the AMS Sectional Meeting at the State University of New York at Stony Brook; *Program in Mathematics for Young Scientists*.
16. March 1, 2016. Number theory seminar talk at the University of Oregon in Eugene, OR; *The Hodge-Tate Sequence and Overconvergent p-Adic Modular Sheaves*.
17. February 29, 2016. Colloquium for the Department of Mathematics at the University of Oregon in Eugene, OR; *p-Adic Variation in the Theory of Automorphic Forms*.
18. November 24, 2015. A 20 minute presentation at the International Outreach Workshop held at the Banff International Research Station (BIRS); *Program in Mathematics for Young Scientists*.
19. April 16, 2015. A 90 minute presentation at the National Council of Teachers of Mathematics meeting, held in Boston, MA; *The Focus on Mathematics Academy*, (w. teachers Shannon Hammond and Tracia Fung).
20. April 15, 2015. A 90 minute presentation at the National Council of Supervisors of Mathematics Conference, held in Boston, MA; *Measuring Secondary Teachers' Use of Standards for Mathematical Practice*, (w. Ryota Matsuura, Sarah Sword, Miriam Gates, Jane Kang, and Al Cuoco).

21. March 26, 2015. Panel Presentation: Mathematics Matters in Education: A Conference in Honor of Roger Howe's 70th Birthday, held at Texas A&M University; *Mathematical Habits of Mind for Teaching*.
22. February 26, 2015. A Mathematics Colloquium, presented to the Debt-M Math and Science Partnership at the Pittsburgh Science and Technology Academy in Pittsburgh, PA; *Learning in the Spirit of Exploration: The Focus on Mathematics Academy*.
23. January 12, 2015: Joint Mathematics Meetings in San Antonio, TX; Special Session on Creating Coherence in K-12 Mathematics; *Empiricism as Unifying Theme in the Standards for Mathematical Practice*.
24. October 18, 2014: American Mathematical Society meeting at Halifax, NS *The eigenvariety machine and a conjecture of Urban*. (50 minute lecture)
25. August 4, 2014: Boston Math Teachers Circle Retreat at Essex, MA. *Experimental mathematics for the classroom*. (45 minute presentation)
26. April 12, 2014: Chicago Symposium Series: *Mathematical empiricism and its role in education: A case study*. (60 minute lecture, followed by 60 minute breakout session)
27. March 28, 2014: Critical Issues in Mathematics Education Conference held at the Mathematical Sciences Research Institute in Berkeley, CA. *The Focus on Mathematics Professional Teacher Academy*.
28. January 17, 2014: Joint Mathematics Meetings in Baltimore, MD. *Exploration with PROMYS: The Program in Mathematics for Young Scientists*. (20 minute session)
29. October 5, 2013: American Mathematical Society meeting at Louisville, KY: Workshop: The Work of Mathematicians and Mathematics Departments in Mathematics. *The Focus on Mathematics (FoM) Professional Teacher Academy*. (30 minute session)
30. August 17, 2013: Clay Mathematics Institute Workshop at Oxford University: Developing Exceptional Talent in Mathematics. *The CMI-PROMYS Alliance* (60 minute session, with David Conlon).
31. April 6, 2013: American Mathematical Society meeting at Boston College. *Slope decompositions and the eigenvariety machine*. (30 minute session)
32. March 6-8, 2013: American Institute of Mathematics Workshop: How to Run a Math Camp. Two 30 minute sessions: 1. *Curriculum Development*, 2. *Financing a Math Camp*
33. February 12, 2013: NSF Learning Network Conference. *Learning to measure our impact: Focus on Mathematics*. (90 minute session, with Al Cuoco, Ryota Matsuura, Mary Beth Piecham, and Sarah Sword)
34. December 8, 2012: Canadian Mathematical Society meeting in Montreal. *The Hodge-Tate sequence and overconvergent p -adic modular sheaves*. (30 minute session)
35. September 25, 2012: Oxford University conference on Rational Points on Curves. *The Hodge-Tate sequence and overconvergent p -adic modular sheaves*. (90 minute lecture)
36. April 24, 2012: Research presession of the Annual Meeting of the NCTM in Philadelphia, PA: 90 minute work session. *Mathematical Habits of Mind for Teaching* (with Sarah Sword, Ryota Matsuura, Al Cuoco, and Mary Beth Piecham).
37. April 15, 2012: Circle on the Road, sponsored by the Mathematical Sciences Research Institute in Washington D.C. *From the math teacher's circle to the math teacher's classroom: PROMYS for Teachers*.
38. January 24, 2012: NSF Learning Network Conference. *Mathematical Habits of Mind for Teaching* (with Sarah Sword, Ryota Matsuura, Al Cuoco, and Mary Beth Piecham).

39. January 6, 2012: Joint Meetings in Boston, MA. MAA Panel on the Park City Mathematics Institute Professional Development Outreach Groups. *PROMYS for Teachers*.
40. January 5, 2012: Joint Meetings in Boston, MA: AMS Panel on Math Camps. *Program in Mathematics for Young Scientists (PROMYS)*.
41. January 4, 2012: Joint Meetings in Boston, MA: MAA Panel: Reporting progress from NSF's MSP programs. *Focus on Mathematics*.
42. November 16, 2011: University of Chicago Number Theory seminar Chicago, IL. *Vanishing Cycles and the Jacquet-Langlands correspondence over the eigencurve*.
43. November 14, 2011: Northwestern University Number Theory Seminar in Evanston, IL. *A cohomological eigenvariety machine and a conjecture of Urban*.
44. November 3, 2011: Banff International Research Station (BIRS): 5-day workshop on Cycles on Modular Varieties. Video recording of *Vanishing Cycles and the Jacquet-Langlands correspondence over the eigencurve*: <http://www.birs.ca/events/2011/5-day-workshops/11w5125/videos>
45. November 3, 2011: Banff International Research Station (BIRS): 5-day workshop on Cycles on Modular Varieties. *Vanishing Cycles and the Jacquet-Langlands correspondence over the eigencurve*
46. September 18, 2011: Boston-Keio Summer Workshop, at Boston University. *p-Adic eigenvarieties and a conjecture of Urban*.
47. September 16, 2011: Boston-Keio Summer Workshop, at Boston University. *p-Adic overconvergent cohomology and p-adic L-functions*.
48. September 15, 2011: Boston-Keio Summer Workshop, at Boston University. *p-Adic variation of Automorphic Forms*.
49. April 12, 2011: Research pre-session of the Annual Meeting of the NCTM in Indianapolis, IN: 90 minute work session. *Mathematical Habits of Mind for Teaching* (with Sarah Sword, Ryota Matsuura, Al Cuoco, and Russell Faux).
50. April 11, 2011: Annual Meeting of the NCSM in Indianapolis, IN: 90 minute symposium for school district administrators. *Assessing Mathematical Habits of Mind in Teachers* (with Sarah Sword, Ryota Matsuura, Al Cuoco, and Russell Faux).
51. March 25, 2011: Institute for Mathematics and Education, University of AZ, Tucson: Panel on Knowledge of Mathematics for Teaching: some thoughts from mathematicians. *On Mathematical Experience*.
52. March 12-16, 2011: Arizona Winter School 2011 on Stark Heegner Points, University of AZ, Tucson. *Overconvergent Modular Symbols* (with R. Pollack and Jay Pottharst).
For video and slides, see <http://swc.math.arizona.edu/aws/2011/index.html>.
53. January 8, 2011: Joint Mathematics Meetings in New Orleans: AMS Panel Discussion: Inquiry-Proof instructional techniques. *Mathematical Habits of Mind and Teacher Preparation*
54. October 4, 2011: Conference Board of the Mathematical Sciences on "Teaching Teachers in the Era of the Common Core" in Reston, VA: 90 minute session. *Communities of Mathematical Practice*.
55. May, 2010: Bowdoin College: 2010 Christie Lectures: *Analysis in Arithmetic*.
56. April, 2010: Harvard University: Number Theory Seminar: *Eigenvarieties for Reductive Algebraic Groups*.
57. February, 2010: Université de Montreal, Montreal, Canada: *Magma Conference on p-adic L-functions*.
58. January, 2010: Joint Meetings in New Orleans: *MAA Panel on Inquiry-Proof Instructional Strategies*

59. December, 2009: Centre de Recerca Matemàtica, Barcelona, Spain: *Cycles and special values of L-series.*
60. November, 2009: Quebec Vermont Number Theory Seminar: McGill University, Montreal: *On a Conjecture of Urban*
61. November, 2009: Quebec Vermont Number Theory Seminar: Concordia University, Montreal. *p-Adic Variation of the Jacquet-Langlands Correspondence: a Geometric Approach*
62. October, 2009: Colloque de mathématiques de Montréal; University of Quebec. *p-Adic Variation in the Theory of Automorphic Forms.*
63. October, 2009: BIRS, Banff: Dedekind Sums in Geometry, Topology, and Arithmetic. *Milnor Algebras, Modular Symbols, and Values of L-functions.* (Videotaped)
64. October, 2009: Conference Board of the Mathematical Sciences (CBMS): Plenary Panel. *Common Core Standards and Improving Teacher Education*
65. May, 2009: Boston University Department of Mathematics and Statistics. *Address to the Class of 2009*
66. April, 2009: Massachusetts Math and Science Partnerships; Holy Cross College, Worcester. *Mathematical Experiences*
67. March, 2009: Undergraduate Mathematics Seminar, University of Connecticut, Storrs. *Connecting the Dots: the Art of Interpolation*
68. December, 2008: Boston University, Boston, MA. *Number Theory Seminar*
69. May, 2008: Mathematical Sciences Research Institute, Berkeley, CA. *Critical Issues in Mathematics Education.*
70. April, 2008: Brandeis University, Waltham, MA. *Modular Symbols and Special Values of L-functions.*
71. March, 2008: University of California, Los Angeles. *Selmer Groups L-functions, and Galois deformations* (2 lectures)
72. March, 2008: University of Arizona, Tucson, AZ. *School-based intellectual leadership in mathematics*
73. January, 2008: NSF Learning Network Conference, Washington D.C. *Deep experience of Mathematics: Impact on Teachers.*
74. November, 2007: Massachusetts DOE Symposium on Algebra 2, Tyngsboro, MA. Panelist: What I wish my students knew about mathematics.
75. September, 2007: Boston University. Number Theory seminar.
76. September, 2007: NSF Discovery Research K-12 meeting, Washington, D.C. Panelist: Preparing and Supporting Effective STEM Teachers: Discipline-Based Professional Societies Respond.
77. July, 2007: Ohio State University, Columbus, OH. Centennial Conference in Honor of Arnold Ross.
78. June, 2007: Banff, International Research Station. Conference on Modular Forms: Arithmetic and Computation.
79. May, 2007: Mathematical Sciences Research Institute, Berkeley, CA. Critical Issues in Mathematics Education: Teaching Teachers Mathematics.
80. May, 2007: Pennsylvania State University, University Park, PA. Math Knowledge for Secondary Mathematics Teaching: Experts' Conference.
81. March, 2007: University of Arizona, Tucson, AZ. Workshop on mathematics courses for teacher preparation.

82. January, 2007: National Science Foundation. MSP Learning Network Conference.
83. January, 2007: National meeting of the American Mathematical Society, New Orleans, LA. Special Session on Mathematicians and Educators.
84. November, 2006: McGill University, Montreal Canada. Number Theory Colloquium.
85. October, 2006: AMS Committee on Education, Washington, DC. Panel on *Productive collaborations of mathematicians and educators*.
86. October, 2006: AMS Special Session on Undergraduate Mathematics Education, Storrs, CT. A Masters Degree in Mathematics for Teaching.
87. July, 2006: Centre International de Rencontres Mathématiques, Luminy. p -Adic Modular Forms and Applications (2 lectures).
88. April, 2006: AMS Special Session on Arithmetic Geometry and Modular Forms, Durham, NH. Sheaves of overconvergent p -adic modular forms.
89. April, 2006: National Council of Supervisors of Mathematics, National Meeting, St. Louis, MS. Special Session on School Mathematical Communities.
90. January, 2006: National Science Foundation, Washington, D.C. MSP Learning Network Conference.
91. September, 2005: University of Montreal, Montreal. Conference on p -adic representation theory.
92. June, 2005: Boston University, Boston. Iwasawa Theory Conference, Open Questions and Recent Developments.
93. June, 2005: Mathematisches Forschungsinstitut Oberwolfach, Germany. Workshop on Algebraische Zahlentheorie.
94. May, 2005: Brandeis University, Waltham. Retirement conference for Paul Monsky.
95. May, 2005: Columbia University, New York. Workshop on p -adic methods in automorphic representation theory.
96. January, 2005: National Science Foundation, Washington, D.C. MSP Learning Network Conference.
97. January, 2005: American Mathematical Society National Meeting, Atlanta. Special Session on Arithmetic Algebraic Geometry.
98. January, 2005: American Mathematical Society National Meeting, Atlanta. Special Session on the Work of Mathematicians in Mathematics Education.
99. Spring, 2004: University of Massachusetts, Amherst. Five Colleges Undergraduate Colloquium.
100. Spring, 2004: Amherst College. Five Colleges Number Theory Seminar.
101. December, 2003: Banff Conference Center. Conference on p -adic Variation of Motives.
102. Fall, 2003: Math Science Partnerships Conference. Developing Teacher Leadership.
103. Spring, 2003: CIRM at Luminy, France. Conference on p -adic automorphic Representation Theory.
104. Spring, 2003: University of Orsay, France. Arithmetic Geometry Seminar.
105. Spring, 2003: Conference on p -adic methods in Automorphic Representation Theory. Two lectures.
106. Spring, 2003: University of Paris XIII. Arithmetic Geometry Seminar.
107. Spring, 2003: University of Paris VII. Arithmetic Geometry Seminar.

108. Spring, 2003: University of Paris VI. Automorphic Representation Theory Seminar.
109. March, 2003: Brown University. Number Theory Seminar.
110. March, 2003: Boston University. Number Theory Seminar.
111. Fall, 2002: University of Illinois, Chicago. Number Theory Seminar.
112. Fall, 2002: Brandeis University. Brandeis, Harvard, MIT Colloquium.
113. Fall, 2001: Boston College. Number Theory Seminar.
114. Fall, 2001: University of Washington. Number Theory Seminar.
115. Spring, 2001: Boston University. Number Theory Seminar.
116. Spring, 2001: Harvard University. Number Theory Seminar.
117. Spring, 2001: New Orleans, LA. Special Session on Mathematics Education Reform, AMS meeting.
118. March, 2000: CUNY Graduate Center. Number Theory Seminar.
119. Fall, 2000: Münster, Germany. Workshop on p -adic Methods in Automorphic Representation Theory.
120. Spring, 2000: Hebrew University; Jerusalem, Israel. Number Theory Seminar.
121. Spring, 2000: Paris, France. Semestre Hecke. Course on p -adic Methods in Automorphic Representation Theory.
122. Spring, 2000: Ohio State University, Columbus. Number Theory Seminar.
123. October, 1999: Middlebury, VT. Mathematics Honors Seminar.
124. June, 1999: Winnipeg, Canada. Plenary address at CMS Meeting on Number Theory.
125. May, 1999: Brown University. Number Theory Seminar.
126. April, 1999: Columbia University. Number Theory Seminar.
127. March, 1999: University of California at Berkeley. Number Theory Seminar.
128. February, 1999: Boston University. Number Theory Seminar.
129. January, 1999: San Antonio, Texas. MER Special Session at the National AMS Meeting.
130. October, 1998: Brown University. Colloquium.
131. August, 1998: Tegernsee, Schloss Ringberg. Max Planck Gesellschaft Conference on polylogarithms.
132. March, 1998: Boston University: MAA Symposium (organized by Emma Previato). Presentation on the nature of Creativity in Mathematics.
133. February, 1998: Jerusalem, Israel. Conference on p -adic methods in automorphic representation theory.
134. October, 1997: Boston University. Mathematics Field Days for New England High School Students (2 lectures).
135. August, 1997: Trieste, Italy. Summer School on Elliptic Curves (2 lectures).
136. June, 1997: Hebrew University. Arithmetic Geometry Seminar.
137. May, 1997: MIT. Rigid Geometry Seminar.
138. April, 1997: Colby College, Maine. Colloquium.

139. April, 1997: McGill University and Concordia University, Montreal. Number Theory Seminars (2 lectures).
140. April, 1997: McGill University. Canadian Mathematical Society Special Session.
141. March, 1997: Johns Hopkins University, Baltimore, Maryland. Japan America Mathematics Institute (JAMI) Conference in Number Theory.
142. March, 1997: Smith College, Massachusetts. Five Colleges Undergraduate Colloquium.
143. March, 1997: Amherst College, Massachusetts. Five Colleges Number Theory Seminar.
144. February, 1997: Southwest Texas State University, San Marcos, Texas. Conference on Programs for Ambitious High School Mathematics Students.
145. November, 1996: Bryn Mawr College, Pennsylvania. Colloquium.
146. November, 1996: Brown University. Colloquium.
147. October, 1996: Boston University. Mathematics Field Days for New England High School Students (2 lectures).
148. October, 1996: Harvard University. Number Theory Seminar.
149. September, 1996: Platja d'Aro, Spain. International Conference on p -Adic Theories.
150. August, 1996: Ohio State University. 20 minute talk at the Arnold Ross Conference.
151. May, 1996: MSRI, Berkeley. Area III seminar.
152. April, 1996: California Institute of Technology, Pasadena. Number Theory Seminar.
153. April, 1996: University of California, Los Angeles. Number Theory Seminar.
154. April, 1996: Pennsylvania State University, State College. 2 lectures: Number Theory Seminar and Colloquium.
155. March, 1996: University of California, Berkeley. Number Theory Seminar.
156. January, 1996: University of California, Santa Cruz. Number Theory Seminar.
157. January, 1996: Orlando, Florida. Special Session of the national meeting.
158. December, 1995: University of Washington, Seattle. Number Theory Seminar.
159. November, 1995: Stanford University, Palo Alto. Colloquium.
160. October, 1995: University of California and MSRI, Berkeley. Colloquium.
161. October, 1995: MSRI, Berkeley. Area III seminar.
162. August, 1995: Boston University. Conference on Fermat's Last Theorem.
163. June, 1995: Hebrew University, Jerusalem, Israel. Special Session of the joint AMS/IMU meeting.
164. May, 1995: Hebrew University, Jerusalem, Israel. Visiting Professor, 3 lectures.
165. March, 1995: Mathematical Sciences Research Institute, Berkeley, CA. Workshop on New Vistas in Automorphic Forms.
166. January, 1995: University of California at Berkeley. Number Theory Seminar.
167. January, 1995: Educational Development Corporation, Newton, Massachusetts. Special Seminar.

168. November, 1994: Brown University. Number Theory Seminar.
169. November, 1994: Harvard University. Number Theory Seminar.
170. November, 1994: University of Illinois at Chicago. Midwest Number Theory Conference.
171. October, 1994: Oklahoma State University, Stillwater. A.M.S. Regional Meeting.
172. October, 1994: Boston University. Mathematics Field Days for New England High School Students (2 lectures).
173. February, 1994: Educational Development Corporation, Newton, Massachusetts. *Connected Geometry* Seminar.
174. February, 1994: Amherst College, Amherst, Massachusetts. Five Colleges Number Theory Seminar.
175. November, 1993: Boston University, Undergraduate Mathematics Association. Special lecture on *Fermat's Last Theorem*.
176. June, 1993: Brown University. Number Theory Seminar.
177. April, 1993: St. Paul's School, Concord, NH. Lecture at the New Hampshire Regional Meeting of the MAA.
178. March, 1993: Arizona State University, Tempe. Conference on Iwasawa Theory.
179. February, 1993: McGill University, Montreal, Canada. Algebra Colloquium.
180. January, 1993: San Antonio, Texas. AMS Special Session: *Changing the Culture*.
181. November, 1992: Boston University. Mathematics Field Day for New England High School Students.
182. November, 1992: Amherst College, Amherst, Massachusetts. Five Colleges Number Theory Seminar.
183. October, 1992: French River School District Conference, Fall River, Massachusetts. Exploring Mathematics with High School Students.
184. October, 1992: Harvard University, Cambridge. Number Theory Seminar.
185. April, 1992: University of Arizona, Tucson. 3 lectures: Mathematics Department Colloquium, Number Theory Seminar, and Mathematics Education Colloquium about the PROMYS Program.
186. March, 1992: Columbia University, New York. Mathematics Colloquium.
187. November, 1991: St. Paul's School, Concord, NH. Mathematics Society.
188. November, 1991: Ohio State University, Columbus, OH. Algebra Seminar.
189. October, 1991: Harvard University, Cambridge. Number Theory Seminar.
190. October, 1991: Temple University, Philadelphia. AMS Special Session on Modular Forms and Arithmetic Geometry.
191. October, 1991: University of Pennsylvania, Philadelphia. Algebra Seminar.
192. January, 1991: University of California, Berkeley. Number Theory Seminar.
193. January, 1991: San Francisco, California. AMS Special Session on Arithmetic Geometry.
194. November, 1990: Brown University, Providence, Rhode Island. Number Theory Seminar.
195. June, 1990: Max Planck Institut, Bonn, West Germany. Special Seminar.

196. June, 1990: Die Katholische Universität, Eichstätt, West Germany. Sonderforschungsbereich Seminar in Cohomology of Arithmetic Groups.
197. May, 1990: University of Bielefeld, Bielefeld, West Germany. Number Theory Seminar.
198. May, 1990: University of Köln, Köln, West Germany. Oberseminar.
199. March, 1990: Rutgers University, New Brunswick, New Jersey. Colloquium.
200. December, 1989: Amherst College, Amherst, Massachusetts. Five Colleges Number Theory Seminar.
201. May, 1989: Centre International de Rencontres Mathématiques. Marseilles/Luminy, France. Conference on *Cohomology of Arithmetic Groups*.
202. April, 1989: College of the Holy Cross, Worcester, Massachusetts. American Mathematical Society Conference, Co-organizer (with K. Rubin) of Special Session on *L-functions and arithmetic*.
203. March, 1989: Princeton University, Princeton, New Jersey. Algebra Colloquium.
204. February, 1989: Brown University, Providence, Rhode Island. Colloquium.
205. January, 1989: University of Arizona, Tucson. Conference on *Arithmetic of Algebraic Curves*.
206. November, 1988: Boston College, Boston, Massachusetts. Colloquium.
207. August, 1988: Brown University, Providence, Rhode Island. Number Theory Seminar.
208. July, 1988: Georg August Universität, Göttingen, West Germany. Sonderforschungsbereich Seminar.
209. May, 1988: The Institute for Advanced Studies, Jerusalem, Israel. Special year in Representation Theory.
210. March, 1988: University of California at Santa Barbara (6 lectures). Symposium in honor of the 20th anniversary of the College of Creative Studies. Colloquium for the mathematics faculty, plus 4 workshops for students.
211. February, 1988: University of California, San Diego. Colloquium.
212. February, 1988: University of Arizona, Tucson. Colloquium.
213. January, 1988: McGill University, Montreal, Canada. Number Theory Seminar.
214. January, 1988: University of Oklahoma, Norman, Oklahoma. Colloquium.
215. December, 1987: University of Massachusetts, Amherst. Colloquium.
216. December, 1987: Brown University, Providence, Rhode Island: Colloquium.
217. December, 1987: Rutgers University, New Brunswick, New Jersey. Special Seminar.
218. November, 1987: Rutgers University, Newark, New Jersey. Colloquium.
219. November, 1987: Brown University, Providence, Rhode Island. Number Theory Seminar.
220. August, 1987: Middlebury College, Middlebury, Vermont. 4 lectures on modern methods in the theory of modular forms.
221. August, 1987: University of Vermont, Burlington, Vermont. Number Theory Seminar.
222. August, 1987: Ohio State University, Columbus, Ohio. Number Theory Seminar.
223. July, 1987: International Conference on Number Theory. Université Laval, Quebec, Canada.
224. April, 1987: Clark University, Worcester, Massachusetts. Colloquium.

- 225. April, 1987: University of Massachusetts, Amherst. Number Theory Colloquium.
- 226. April, 1987: Yale University, New Haven, Connecticut. Lie Groups Seminar.
- 227. January, 1987: Mathematical Sciences Research Institute, Berkeley. 75 minute lecture.
- 228. July, 1986: Harvard University, Cambridge, Massachusetts. Number Theory Seminar.
- 229. May, 1986: Conference on Number Theory. Ohio State University–Denison University, Denison, Ohio.
- 230. February, 1986: Columbia University, New York. Representation Theory Seminar.
- 231. April, 1985: University of Pennsylvania, Philadelphia. Algebra Seminar.
- 232. March, 1985: Rutgers University, New Brunswick, New Jersey. Number Theory Seminar.
- 233. November, 1984: Massachusetts Institute of Technology. Number Theory Seminar.
- 234. May, 1984: Conference on Number Theory. Ohio State University–Denison University, Denison, Ohio.
- 235. February, 1984: University of Michigan, Ann Arbor. Colloquium.
- 236. February, 1984: Boston University, Boston, Massachusetts. Colloquium.
- 237. February, 1984: University of Georgia, Athens. Colloquium.
- 238. February, 1984: University of Texas, Austin. Colloquium.
- 239. December, 1983: Ohio State University, Columbus, Ohio. Number Theory Seminar.
- 240. October, 1983: University of Maryland. Number Theory Seminar.
- 241. July, 1983: Harvard University. Number Theory Seminar.
- 242. May, 1983: Institute for Advanced Study, Princeton, New Jersey. Number Theory Seminar.
- 243. November, 1982: University of California at Santa Barbara. Colloquium.
- 244. November, 1982: University of California at Berkeley. Number Theory Seminar.
- 245. July, 1982: Conference on Special Values of L-series. University of New Hampshire, Durham.
- 246. June, 1982: Georg August Universität, Göttingen, West Germany. Colloquium.
- 247. May, 1982: Conference on Number Theory. Ohio State University–Denison University, Denison, Ohio.
- 248. March, 1982: Brandeis University, Waltham, Massachusetts. Number Theory Seminar.
- 249. February, 1982: Columbia University, New York. Colloquium.
- 250. November, 1981: Princeton University, Princeton, New Jersey. Algebra Colloquium.

Books Reviewed for Mathematical Reviews

- 1. Akhiezer, N.I.: *Elements of the Theory of Elliptic Functions*. Translations of Mathematical Monographs **79**. American Mathematical Society, 1990. **MR91ki:33016**.
- 2. Ireland, K. and Rosen, M.: *A Classical Introduction to Modern Number Theory* (second edition). Graduate Texts in Mathematics **84**. Springer-Verlag, 1990. **MR92e:11001**.
- 3. Iwasawa, K.: *Local class field theory*. The Clarendon Press, Oxford University Press, 1986. **MR88b:11080**.

Articles Reviewed for Mathematical Reviews

4. Ash, A., Borel, A.: Generalized Modular Symbols. *Proceedings of the Conference on Cohomology of Arithmetic Groups and Automorphic Forms, Luminy/Marseilles 1989* (edited by J.-P. Labesse, J. Schwermer). Lecture Notes in Mathematics **1447** 57-75 (1990). **MR92e:11058**.
5. Ash, A., Ginzburg, D.: p -adic L -functions for $GL(2n)$. *Invent. Math.* **116** (1994), no. 1-3, 27-73. **MR95f:11038**.
6. Beilinson, A. A.: Higher regulators of modular curves. *Contemporary Mathematics* **55, Part I**, 1-33 (1986). **MR88f:11060**.
7. Blasius, D., Franke, J., Grunewald, F.: Cohomology of S -arithmetic subgroups in the number field case. *Invent. Math.* **116** (1994), no. 1-3, 75-93. **MR96h:11047**.
8. Bloch, S., Grayson, D.: K_2 and L -functions of elliptic curves, computer calculations. *Contemporary Mathematics* **55, Part I**, 79-88 (1986). **MR88f:11061**.
9. Boxall, J. L.: Interpolation p -adique des dérivées logarithmiques et fonctions L $\mathcal{P}$ -adiques associées a courbes elliptiques a multiplication complexe. *Seminaire de Théorie des Nombres de Bordeaux*, Année 1984-1985, exposé 19. **MR87i:11174**.
10. Brown, M.: Construction de Hauteurs locales et globales sur les variétés algébriques. *C. R. Acad. Sc. Paris* **307 (I)**, 87-90 (1988). **MR90a:11068**.
11. Carayol, H.: Non-abelian Lubin-Tate Theory. In *Automorphic Forms, Shimura Varieties, and L-Functions*. Academic Press, 1990. pp. 15-39. **MR91i:11169**.
12. Cassou-Noguès, Ph., Taylor, M. J.: Unités modulaires et monogénéité d'anneaux d'entiers. *Séminaire de Théorie des Nombres*, 35-63 (1986-87). **MR90g:11155**.
13. Chellali, M.: Congruences entre nombres de Bernoulli-Hurwitz dans le cas supersingulier. *J. Number Theory* **35**, 157-179 (1990). **MR92f:11079**.
14. Coates, J.: Motivic p -adic L -functions. *L-functions and arithmetic (Durham, 1989)*, 141-172, *London Math. Soc. Lecture Note Ser.*, 153, Cambridge Univ. Press, Cambridge, 1991. **MR93b:11082**.
15. Cremona, J. E.: Periods of Cusp Forms and Elliptic Curves over Imaginary Quadratic Fields. In *Elliptic curves and related topics*, 29-44, *CRM Proc. Lecture Notes* **4**, Amer. Math. Soc., Providence, RI, 1994. **MR95i:11046**.
16. Darmon, H.: Heegner points, Heegner cycles, and congruences. *Elliptic curves and related topics*, 45-59, CRM Proc. Lecture Notes **4**, Amer. Math. Soc., Providence, RI, 1994. **MR95i:11064**.
17. Deligne, P., Husemoller, D.: Survey of Drinfeld Modules. *Contemporary Mathematics* **67**, 25-91 (1987). **MR89f:11081**.
18. Friedberg, S., Jacquet, H.: Le lemme fondamental pour le sous-groupe de Shalika de $GL(4)$. *C.R. Acad. Sci. Paris* **316 (I)**, 407-410 (1993). **MR94g:11035**.
19. van der Geer, G., van der Vlugt, A.: Kloosterman sums and the p -torsion of certain Jacobians. *Math. Ann.* **290**, 549-563 (1991). **MR92m:11058**.
20. Goldfeld, D.: On the computational complexity of modular symbols. *Math. Comp.* **58**, no. 198 (1992). **MR93a:11042**.
21. Gross, B.: Local orders, root numbers, and modular curves. *Amer. J. Math.* **110**, 1153-1182 (1988). **MR90b:11053**.
22. Gross, B., Keating, K.: On the intersection of modular correspondences. *Invent. Math.* **112**, 225-245 (1993). **MR94h:11046**.

23. Haran, S.: p -adic L -functions for modular forms. *Compositio Math.* **62** (1987), no. 1, 31-46. **MR88k:11036.**
24. Hellegouarch, Y.: Théorème de Terjanian généralisé. *Séminaire de Théorie des Nombres, Bordeaux* **2**, 245-254 (1990). **MR92d:11024.**
25. Henniart, G., Mestre, J.-F.: Moyenne arithmético-géométrique p -adique. *C. R. Acad. Sc. Paris* **308** (I), 391-395 (1989). **MR90g:11075.**
26. Hesselmann, S.: Zur Torsion der Kohomologie S -arithmetischer Gruppen. *Bonner Mathematische Schriften* **257**. Universität Bonn, Mathematisches Institut, Bonn, 1993. 94 pp. **MR95m:11053.**
27. Hida, H.: p -Ordinary cohomology groups for $SL(2)$ over number fields. *Duke Math. J.* **69** (2), 259-313 (1993). **MR94g:11031.**
28. Igusa, J.: Universal p -adic zeta functions and their functional equations. *Amer. J. Math.* **111**, 671-716 (1989). **MR91e:11142.**
29. Kamienny, S.: Torsion points on elliptic curves and q -coefficients of modular forms. *Invent. Math.* **109**, 221-229 (1992). **MR93h:11054.**
30. Keating, K.: Galois Characters associated to formal A -modules. *Compositio Math.* **67**, 241-269 (1988). **MR90b:11128.**
31. Kozuka, K.: Elliptic units and two variable p -adic L -functions. *Memoirs Fac. Sci., Kyushu Univ.* **40** (A) (2), 77-90 (1986). **MR87k:11122.**
32. Kozuka, K.: On two variable p -adic L -functions and p -adic class number formula. *Tokyo J. Math.* **12** (1989), No. 1, 75-90. **MR90g:11158.**
33. Landsburg, S. E.: p -adic cohomology and zeta functions of elliptic curves. *The curves seminar at Queen's, Vol. IV (Kingston, Ont., 1985-1986)*, Exp. No. K, 59 pp., *Queen's Papers in Pure and Appl. Math.*, **76**, Queen's Univ., Kingston, Ont., 1986. **MR88k:14012.**
34. Lee, Min Ho: Twisted torus bundles over arithmetic varieties. *Proc. Amer. Math. Soc.* **123** (1995), no. 7, 2251-2259. **MR96e:22021.**
35. Lee, Min Ho: Hodge Structures of parabolic cohomology. *Math. J. Toyama Univ.* **17** (1994), 73-85. **MR96d:11061.**
36. Lim, C.-H.: Endomorphisms of Jacobian varieties of Fermat curves. *Compositio Math.* **80**, 85-110 (1991). **MR93a:14025.**
37. Mao, Z.: Sur les sommes de Salié relatives. *C. R. Acad. Sc. Paris* **316** (I), 1257-1262 (1993). **MR94k:11059.**
38. Michel, A.: Une formule de Riemann-Hurwitz pour le groupe de Selmer d'une courbe elliptique. *Ann. Inst. Fourier, Grenoble* **43** (1), 57-84 (1993). **MR94g:11097.**
39. Mori, A.: An integrality criterion for elliptic modular forms. *Rend. Mat. Acc. Lincei* **9** (1), 3-9 (1990). **MR92c:11049.**
40. Mori, A.: A condition for the rationality of certain elliptic modular forms over primes dividing the level. *Atti Acad. Naz. Lincei Cl. Sci. Fis. Mat. Natur. Rend.* (9) Mat. Appl. **2** (1991), no. 2. **MR93c:11028.**
41. Murty, M. Ram; Rajan, C. S.: Stronger multiplicity one theorems for forms of general type on GL_2 . *Analytic number theory*, Vol. 2 (Allerton Park, IL, 1995), 669-683, *Progr. Math.*, **139**, Birkhäuser Boston, Boston, MA, 1996. **MR97h:11047.**
42. Ohta, M.: On cohomology groups attached to towers of algebraic curves. *J. Math. Soc. Japan* **45** (1), 133-185 (1993). **MR94c:11052.**

43. Perrin-Riou, B.: Points de Heegner et dérivées de fonctions L p -adiques. *C. R. Acad. Sc. Paris* **303** (I), 165-168 (1986). **MR88c:11040.**
44. Perrin-Riou, Bernadette p -adic L functions and trivial zeroes. Elliptic curves and modular forms (Washington, DC, 1996). *Proc. Nat. Acad. Sci. U.S.A.* **94** (1997), no. 21, 11118–11120. **MR99g:11085.**
45. Ramakrishnan, D.: Analogs of the Bloch-Wigner function for higher polylogarithms. *Contemporary Mathematics* **55**, I, 371-376 (1986). **MR88d:11115.**
46. Ribet, K.: On modular representations of $Gal(\overline{\mathbf{Q}}/\mathbf{Q})$ arising from modular forms. *Invent. Math.* **100**, 431-476 (1990). **MR91g:11055.**
47. Ribet, K.: Raising the levels of modular representations. *Séminaire de Théorie des Nombres, Paris 1987-88*, 259-271 (1989). **MR91g:11066.**
48. Rosen, M.: Fourier series and special values of Hecke L -functions. *American Mathematical Society* (1987). **MR89c:11166.**
49. Schmidt, C.: Relative modular symbols and p -adic Rankin-Selberg convolutions. *Invent. Math.* **112**, 31-76 (1993). **MR94g:11034.**
50. Schwermer, J.: Cohomology of arithmetic groups, automorphic forms and L -functions. *Proceedings of the Conference on Cohomology of Arithmetic Groups and Automorphic Forms, Luminy/Marseille 1989* (edited by J.-P. Labesse, J. Schwermer). *Lecture Notes in Mathematics* **1447** 1-29 (1990). **MR92e:11059.**
51. Schwermer, J.: Eisenstein series and cohomology of arithmetic groups: the generic case. *Invent. Math.* **116** (1994), no. 1-3, 481-511. **MR95h:11049.**
52. Schwermer, J.: On Euler products and residual Eisenstein cohomology classes for Siegel modular varieties *Forum. Math.* **7** (1995), no. 1, 1-28. **MR96d:11062.**
53. Serre, Jean-Pierre: Répartition asymptotique des valeurs propres de l'opérateur de Hecke T_p . *J. Amer. Math. Soc.* **10** (1997), no. 1, 75–102. **MR97h:11048.**
54. Shepherd-Barron, N. I.; Taylor, R.: mod2 and mod5 icosahedral representations. *J. Amer. Math. Soc.* **10** (1997), no. 2, 283–298. **MR97h:11060.**
55. Shioda, T.: Arithmetic and geometry of Fermat curves. *Proceedings of the Algebraic Geometry Seminar, Singapore*, 95-102 (1987). **MR90a:11037.**
56. Szpiro, Lucie: Présentation de la théorie d'Arakélov. *American Mathematical Society* (1987). **MR89c:14005.**
57. Tan, K.-S.: Modular elements over function fields. *J. No. Theory* **45**, 295-311 (1993). **MR95d:11158.**
58. Wingberg, K.: A Riemann-Hurwitz formula for the Selmer group of an elliptic curve with complex multiplication. *Comm. Math. Helv.* **63**, 587-592 (1988). **MR90b:11061.**
59. Wintenberger, J.-P.: Groupes algébriques associés à certaines représentations p -adiques. *Amer. J. Math.* **108** (1986), no. 6, 1425-1466. **MR88j:14056.**