

## CURRICULUM VITAE

Lynne H. Walling

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### Education

- Ph.D. Dartmouth College, 1987  
*Theta series attached to lattices of arbitrary rank*  
Advisor: Thomas R. Shemanske
- B.A. Sonoma State University, 1982

### Professional Positions

- |                            |                              |                                                         |
|----------------------------|------------------------------|---------------------------------------------------------|
| 2011–2015                  | Head of Pure Maths           | University of Bristol, UK                               |
| 2007–present               | Reader                       | University of Bristol, UK                               |
| 2004–2006                  | Chair                        | University of Colorado, Boulder                         |
| 2002–2004                  | Graduate Chair               | University of Colorado, Boulder                         |
| 2000–2002                  | ANTC Program Officer         | National Science Foundation                             |
| 2000–2007                  | Professor                    | University of Colorado, Boulder                         |
| November 2000,<br>May 2001 | Visiting Scientist           | RIP Program,<br>Oberwolfach Germany                     |
| January 2000               | Visiting Scientist           | Max Planck Institute, Bonn                              |
| 1997–1998                  | NSF Visiting<br>Assoc. Prof. | UC Berkeley, California                                 |
| 1995–2000                  | Associate Professor          | University of Colorado, Boulder                         |
| 1995–1996                  | Visiting Assoc. Prof.        | Mills College, California                               |
| summer 1995                | Seminar Leader               | Summer Mills Institute, Berkeley                        |
| 1994–1995                  | Member                       | Mathematical Sciences<br>Research Institute, California |
| 1992–1993                  | Undergraduate Chair          | University of Colorado, Boulder                         |
| 1990–1995                  | Assistant Professor          | University of Colorado, Boulder                         |
| 1989–1990                  | Assistant Professor          | Bates College, Maine                                    |
| 1987–1989                  | Assistant Professor          | St. Olaf College, Minnesota                             |
| 1984–1987                  | Instructor                   | Dartmouth College, New Hampshire                        |
| 1982                       | Instructor                   | Sonoma State University, California                     |

## Research Interests

- automorphic forms (including integral and half-integral weights, holomorphic and non-holomorphic, Hilbert, Siegel, Jacobi, Hilbert-Siegel, Hilbert-Jacobi, and forms over function fields)
- Hecke operators
- lattices and quadratic forms over number fields and function fields, particularly their representation numbers and associated Siegel and Jacobi theta series

## Grants and Awards

- National Science Foundation Research Award (May 1991 – April 1994; travel + 2 months summer salary each year)
- National Security Agency Research Award (November 1993 – October 1995; 13,000 USD)
- National Science Foundation Visiting Professorship for Women Award (August 1997 – July 1998; travel + conference funding + full salary for 1 year)
- National Science Foundation Conference Award (with David Farmer, 2003)
- Inaugural Fellow of the American Mathematical Society (2013)
- LMS-CMI Research School Award (summer 2014; 31,000 GBP)
- HIMR Conference Award (summer 2014, with Jonathan Bober; 20,000 GBP)
- EMS Summer School Award (summer 2016, with Lejla Smajlovic and Jay Jorgenson; 6,000 EUR)
- HIMR Summer School Award (summer 2016; 5,000 GBP)
- Foundation Compositio Conference Award (summer 2016; 4,000 EUR)
- NTF Summer School Award (summer 2016; 3,000 USD)
- University of Bristol Research Fellowship (September 2016 – August 2017; essentially, a full-year sabbatical)
- Elsevier summer school + workshop award (summer 2016, with Lejla Smajlovic; 3,000 USD)
- HIMR Summer School Award (summer 2018; 5,000 GBP)
- Foundation Compositio Conference Award (summer 2018; 4,000 EUR)
- NTF Summer School Award (summer 2018; 3,000 USD)

### Professional Memberships

- American Mathematical Society
- London Mathematical Society
- Association for Women in Mathematics
- European Women in Mathematics

### Research Publications

1. *Hecke operators on theta series attached to lattices of arbitrary rank*, Acta Arith. **54** (1990), 213–240.
2. *On lifting Hecke eigenforms*, Trans. A.M.S. **328** (1991), 881–896.
3. *Relations on representation numbers of quadratic forms*, Pacific J. Math. **151** (1991), 179–200.
4. *Hecke eigenforms and representation numbers of arbitrary rank lattices*, Pacific J. Math. **156** (1992), 371–394.
5. (with T.R. Shemanske) *On the Shimura lift for Hilbert modular forms*, in “A Tribute to Emil Grosswald: Number Theory and Related Analysis,” AMS Contemporary Mathematics, 1993.
6. (with T.R. Shemanske) *Twists of Hilbert modular forms*, Trans. AMS **338** (1993), 375–403.
7. *A remark on differences of theta series*, J. Number Theory **48** (1994), no. 2, 243–251.
8. *On cuspidal eigenforms constructed from theta series* in “Markoff Spectrum and Diophantine Approximation and Analytic Number Theory,” Marcel Dekker, 1993.
9. *The Eichler Commutation Relation for theta series with spherical harmonics*, Acta Arith. **63** (1993), no. 3, 233–254.
10. (with K.D. Merrill) *Sums of squares over function fields*, Duke J. of Math **71** (1993), 665–684.
11. (with T.R. Shemanske) *Determining multiplicities of half-integral weight newforms*, Pacific J. of Math. (1995).
12. (with K.D. Merrill) *Quadratic reciprocity over function fields*, Pacific J. of Math. **173** (1996), 147–150.
13. *Explicit Siegel theory: an algebraic approach*, Duke Math. J. **89** (1997), 37–74.

14. (with J.L. Hafner) *Eisenstein series and indefinite quadratic forms*, Forum Math. **11** (1999), 313–348.
15. (with J. Hoffstein and K.D. Merrill) *Automorphic forms and sums of squares over function fields*, J. Number Theory **79** (1999), 301–329.
16. (with J.L. Hafner) *Explicit action of Hecke operators on Siegel modular forms*, J. Number Theory **93** (2002), 34–57.
17. (with R. Scharlau) *A weak multiplicity-one theorem for Siegel modular forms*, Pacific J. Math. **211**, no. **2** (2003), 369–374.
18. (with J.L. Hafner) *Average Fourier coefficients for degree 2 Siegel modular forms*, Conference Proceedings of the Millenium Conference on Number Theory for the millennium, II (Urbana, IL, 2000), 117–148, 2002.
19. *On bounding Hecke-Siegel eigenvalues*, J. Number Theory **117** (2006), 387–396.
20. *Action of Hecke operators on Siegel theta series I*, International J. Number Theory **2**, No. **2** (2006), 169–186.
21. (with S. Caulk) *Hecke operators on Hilbert-Siegel modular forms*, Int. J. Number Theory **3**, No. **3** (2007), 391–420.
22. *Action of Hecke operators on Siegel theta series II*, Int. J. Number Theory **4**, No. **6** (2008), 981–1008.
23. *Restricting Hecke-Siegel operators to Jacobi modular forms* J. Number Theory **129**, No. **7** (2009), 1709–1733.
24. *On a reciprocity theorem of Gauss* in “Quadratic Forms – algebra, arithmetic, and geometry,” 391–397, Contemporary Mathematics 493 (Providence, Rhode Island, 2009).
25. (with T. Shemanske, S. Treneer) *Constructing simultaneous Hecke eigenforms* Int. J. Number Theory **6**, No. **5** (2010), 1117–1137.
26. *Hecke eigenvalues and relations for degree 2 Siegel Eisenstein series*, J. Number Theory **132**, No. **11** (2012), 2700–2723.
27. *A formula for the action of Hecke operators on half-integral weight Siegel modular forms and applications*, J. Number Theory **133**, No. **5** (2013), 1608–1644.
28. *Hecke eigenvalues and relations for Siegel Eisenstein series of arbitrary degree, level, and character*, Int. J. Number Theory no. **2** (2017), 325–370,(published electronically 2016), arXiv:1412.4588.

29. *Hecke operators on half-integral weight Siegel Eisenstein series*, Int. J. Number Theory (published electronically 2017), 35 pages, arXiv:1605.09292.
30. *Some relations on Fourier coefficients of degree 2 Siegel forms of arbitrary level*, J. Number Theory **180** (2017), 349-359, arXiv:1608.00158.
31. *Explicitly realizing average Siegel theta series as linear combinations of Eisenstein series*, (provisionally accepted), 21 pages, arXiv:1702.06494.
32. *Higher level quadratically twisted Gauss sums and totally isotropic subspaces* (submitted), 16 pages, arXiv:1708.07978.
33. (with Dan Fretwell) *Hecke operators on Hilbert-Siegel theta series*, manuscript in preparation.

### **Books**

1. (with J. Jorgenson) Eds., “The Ubiquitous Heat Kernel,” Contemporary Mathematics **398** (Providence, Rhode Island, 2006), 402 pages.
2. (with J. Jorgenson and L. Smajlovic) Eds., “Proceedings of the 3rd EU/US Summer School and Workshop on Automorphic forms and Related Topics,” Contemporary Mathematics (in progress).

### Invited Addresses at International Conferences

1. "Some arithmetic relation on representation numbers of quadratic forms," Special Session, Regional AMS Meeting, UC Santa Barbara, California, November 1991.
2. "Lifting Hecke eigenforms," Conference to celebrate the 80th birthday of Joseph Lehner, Swarthmore College, Pennsylvania, October 1992.
3. "Spectral decomposition and sums of squares," Special Session, AMS Regional meeting, Manhattan Kansas, March 1994.
4. "Explicit Siegel theory," Plenary Address, Canadian Number Theory Association International Conference, Halifax, Nova Scotia, July 1994.
5. "Spectral theory and sums of squares over function fields," Special Session, Regional AMS Meeting, Oklahoma State University, October 1994.
6. "Automorphic forms and sums of squares over function fields," International Conference on Analytic Number Theory (in honor of Heine Halberstam), University of Illinois Urbana-Champaign, May 1995.
7. "Siegel modular forms and Hecke operators," Conference on Modular Forms, Oberwolfach Germany, December 1998.
8. "Siegel forms, quadratic forms and Hecke operators," Special Session, Regional AMS meeting, University of Illinois Urbana-Champaign, March 1999.
9. "Modular forms, quadratic forms, and Hecke operators," Plenary Address, Sectional AMS Meeting, Las Vegas, April 2001.
10. "Eigenvalues of Hecke operators on Siegel modular forms," Special Session, Sectional AMS Meeting, Salt Lake City Utah, October 2002.
11. "Hecke operators on Siegel modular forms" and "Applications of Hecke operators in Siegel modular forms," Plenary Addresses, KIAS and Postech University Workshop on Modular Forms, KIAS, Seoul Korea, December 2002.
12. "Quadratic forms and automorphic forms," Plenary Address, First International Conference of the Korean Women in Mathematical Sciences, KIAS, Seoul Korea, June 2004.
13. "Hecke operators on Siegel theta series," Conference on Modular Forms, Oberwolfach Germany, November 2007.
14. "On a reciprocity theorem of Gauss," International Conference on the Algebraic and Arithmetic Theory of Quadratic Forms 2007, Lake Llanquihue, Chile, December 2007.

15. “Siegel modular forms, Hecke operators, and  $L$ -series,” International Workshop: Computations with Modular Forms, Bristol UK, August 2008.
16. “Quadratic forms, Siegel modular forms, and a Hecke correspondence,” International Conference on Mock Theta Functions, Max Planck Institut, Bonn Germany, May 2009.
17. “Interplay between Siegel modular forms and quadratic forms,” Joint Meeting of the Korean Mathematical Society and the American Mathematical Society, December 2009.
18. “Hecke operators on degree 2 Siegel-Eisenstein series of square-free level,” Automorphic Forms: Advances and Applications, Centre International de Rencontres Mathématique, Luminy France, May 2011.
19. “Hecke Operators on Degree 2 Eisenstein Series and Higher Representation Numbers,” Conference on Automorphic forms and  $L$ -functions, Research Institute for Mathematical Sciences, Kyoto Japan, January 2012.
20. “Hecke Operators on Siegel Eisenstein Series,” Explicit Theory of Automorphic Forms, Tangji University, Shanghai China, March 2014.
21. “Hecke Operators on Siegel Eisenstein Series of Integral and Half-integral weights,” Automorphic Forms and Arithmetic (Satellite Conference for ICM 2014), POSTECH, Pohang South Korea, August 2014.
22. “Explicit action of Hecke operators on half-integral weight Siegel Eisenstein series,” Explicit Methods in Number Theory: Conference in Honour of Cremona’s 60th Birthday, April 2016.
23. “Representation numbers and the Eichler Commutation Relation,” Southern New England Conference on Quadratic Forms and Modular Forms, June 2016.

### Conferences Organized

1. Conference to Celebrate Women Mathematicians in Number Theory and Analysis, UC Berkeley, California, August 1997.
2. (co-organizer, with Dorothy Wallace) 4th Annual Workshop on Automorphic Forms and Related Topics, Dartmouth College, New Hampshire, January 1990.
3. 6th Annual Workshop on Automorphic Forms and Related Topics, University of Colorado, Boulder, March 1992 (with support from UC Boulder Center for Number Theory).
4. (co-organizer, with Daniel Bump) 7th Annual Workshop on Automorphic Forms and Related Topics, Stanford University, California, March 1993.
5. (co-organizer, with Jeffrey Stopple) 8th Annual Workshop on Automorphic Forms and Related Topics, UC Santa Barbara, California, March 1994.
6. 11th Annual Workshop on Automorphic Forms and Related Topics, University of Colorado, Boulder, March 1997 (with support from UC Boulder Center for Number Theory).
7. Conference to Celebrate Women Mathematicians in Number Theory and Analysis, UC Berkeley, August 1997 (with support from NSF, UC Berkeley, and MSRI).
8. (co-organizer, with Daniel Bump) 12th Annual Workshop on Automorphic Forms and Related Topics, Stanford University, California, March 1998.
9. (co-organizer, with Jeffrey Stopple) 13th Annual Workshop on Automorphic Forms and Related Topics, UC Santa Barbara, California, March 1999.
10. (co-organizer, with Rudolf Scharlau) 14th Annual Workshop on Automorphic Forms and Related Topics, University of Colorado, Boulder, March 2000 (with support from UC Boulder Center for Number Theory).
11. 17th Annual Workshop on Automorphic Forms and Related Topics, University of Colorado, Boulder, March 2003 (with support from UC Boulder Center for Number Theory).
12. (co-organizer, with Jay Jorgenson) *The Ubiquitous Heat Kernel*, Special Session, Sectional AMS Meeting, University of Colorado-Boulder, October 2003.
13. (co-organizer, with Suzanne Caulk and Richard Hill) 20th Annual Workshop on Automorphic Forms and Related Topics, University of Colorado, Boulder, March 2006 (with support from UC Boulder Center for Number Theory).
14. (co-organiser, with Aloys Krieg, Martin Raum, and Olav Richter) Building Bridges: 1st EU/US Summer School + Workshop on Automorphic Forms and



Related Topics, University of Aachen, June 2012 (with support from NSF and University of Aachen).

15. (co-organiser, with Jennifer Beineke and Jonathan Bober) Building Bridges: 2nd EU/US Summer School + Workshop on Automorphic Forms and Related Topics, University of Bristol, July 2014 (with support from NSF, LMS, CMI, HIMR).
16. (co-organiser, with Tim Dokchitser) 2016 British Mathematics Colloquium, University of Bristol, March 2016 (with support from LMS, CMI, Foundation Compositio, HIMR).
17. (co-organiser, with Jay Jorgenson and Lejla Smajlovic) Building Bridges: 3rd EU/US Summer School + Workshop on Automorphic Forms and Related Topics, University of Sarajevo, July 2016 (with support from NSF, EMS, HIMR, Foundation Compositio, NTF, University of Sarajevo Department of Economics).
18. (co-organiser, with Gergely Harcos, Jay Jorgenson and Arpad Toth) Building Bridges: 4th EU/US Summer School + Workshop on Automorphic Forms and Related Topics, Renyi Institute, July 2016 (with support from NSF, Journal of Number Theory, HIMR, Foundation Compositio, NTF, Renyi Institute).

### Diversity and Outreach Presentations

1. “Gauss sums and taxi cabs in New York City,” Undergraduate Colloquium, Sonoma State University, California, April 1988.
2. “What it’s like to be a woman mathematician,” St. Aloysius College, Adelaide, South Australia, August 1991.
3. “Being a woman mathematician,” West View Middle School, Longmont Colorado, November 1993.
4. “Being a woman mathematician – and surviving,” Centurion High School, Lafayette Colorado, December 1994.
5. “Number theory and induction” (a series of 3 talks), Larkspur Middle School, Larkspur California, Fall 1997.
6. “Lattices and sums of squares,” Carlton College Summer Program Colloquium, Minnesota, July 1998.
7. “Poisson summation and quadratic reciprocity” (a series of 2 talks), Mathematics program for talented high school students, City College, New York, July 2001.
8. “Women in Mathematics: Participating, Surviving, and Succeeding,” Conference in Honor of Audrey Terras, UC San Diego, California, September 2002.
9. Panel Presentation, “Mentoring”, for *Encouraging and Retaining Women and Other Underrepresented Groups*, 18th Annual Workshop on Automorphic Forms and Related Topics, UC Santa Barbara, California, March 2004. <http://www2.maths.bris.ac.uk/~malhw/afw-panel-04.pdf>
10. “Poisson summation and sums of squares,” Clemson College REU Colloquium, South Carolina, July 2004.
11. Panel Presentation, “The continuing Struggle for Equity as Women in Mathematics,” for *Women’s Role in Mathematics*, The First International Conference of the Korean Women in Mathematical Sciences, KIAS, Seoul Korea, June 2004. <http://www2.maths.bris.ac.uk/~malhw/korea-panel.pdf>
12. Panel Presentation, “Battling apathy and offering opportunity,” for *Challenges in Undergraduate Education*, National meeting of the AMS Committee on Education, Washington D.C., October 2004. <http://www2.maths.bris.ac.uk/malhw/ug-education.pdf>
13. “Women in Mathematics: Participating, Surviving, and Succeeding,” Concurrent Session, Conference on World Affairs, University of Colorado-Boulder, April 2005. <http://www2.maths.bris.ac.uk/~malhw/women.pdf>

14. "Ambition and the Female Mathematician," University of Heidelberg, January 2010. <http://www2.maths.bris.ac.uk/~malhw/>
15. "Women in Mathematics: Ambition in an ambivalent society," University of Nottingham, March 2015;  
<http://www2.maths.bris.ac.uk/~malhw/women-bmr-nopauses.pdf> (slides),  
<https://www.youtube.com/watch?v=-FQWpfZIPT8> (youtube)
16. "The art and beauty of pure mathematics," University of Bristol's Best of Bristol lecture series, June 2016;  
<http://www.maths.bris.ac.uk/~malhw/BoB.pdf> (slides),  
[https://www.youtube.com/watch?v=XoKIfCgiA\\_w](https://www.youtube.com/watch?v=XoKIfCgiA_w) (youtube)

### **Graduate Students Supervised**

- Amnon Ben-Pazi, master's student, spring 1992
- John McNamee, master's student, spring 1992
- Jennifer Taggart, master's student, spring 1993
- Deanne Estep, master's student, fall 1995
- Carl Lienert, doctoral student, 1995–1998
- Suzanne Caulk, master's student, spring 1997
- Suzanne Caulk, doctoral student, 1998–2002
- Michael Daniel, doctoral student, 2003–2006
- Cayman Seacrest, master's student, fall 2006
- Maria Teider, doctoral student, 2008–2012
- Martin Dickson, doctoral student, 2011–2015
- Robbie Coats, MSc student, summer 2014

### **Courses Taught**

- Quantitative Reasoning and Mathematical Skills
- Business Calculus
- Calculus I, II, and III
- Foundations & Proof
- Linear Algebra
- Linear Programming
- Abstract Algebra
- Introduction to Number Theory
- Point-set Topology
- Real Analysis
- Galois Theory
- Commutative Algebra
- Graduate Algebra
- Graduate Number Theory
- Modular Forms
- Graduate Complex Analysis
- Advanced Topics in Number Theory

### **Significant Course Development**

- *Quadratic reciprocity and continued fractions* in “Women in Mathematics: Scaling the Heights,” eds. Deborah Nolan, MAA Notes, volume 46, 1997, p. 81-86.
- *Introduction to Arithmetic and Number Theory, A Quantitative Reasoning and Mathematical Skills Workbook.*  
<http://www2.maths.bris.ac.uk/~malhw/book.pdf>
- Calculus 1 Weekly Workshops.  
<http://www2.maths.bris.ac.uk/~malhw/workshops.pdf>
- Professional Development Seminar for Mathematics Graduate Students.
- Linear Algebra & Geometry (wrote new lecture notes, exercises, and solutions).  
<http://www2.maths.bris.ac.uk/~malhw/LAG-tb1.pdf>
- Algebra 2 (wrote new lecture notes, exercises, and solutions).
- Foundations & Proof (created the course and course materials, including lecture notes, exercises, and solutions).

### **Leadership and Innovation**

- As Seminar Leader of “Quadratic Reciprocity and Continued Fractions,” Summer Mills Institute (NSF and NSA sponsored program for talented undergraduate women), held at UC Berkeley, California, developed course materials for students to solve problems in teams
- As Undergraduate Chair at University of Colorado, led a curriculum review and revised graduation requirements; introduced a new introductory proof-writing course based on point-set topology
- As Graduate Chair at University of Colorado, introduced the Professional Seminar to work with graduate students preparing job application materials, conducting mock interviews, and discussing various professional topics
- As Chair at University of Colorado, secured the university’s agreement for a post-doctoral position (previous to this, the department had no post-doctoral fellows since the late 1970s); secured \$300,000 increase to annual salary pool (28 departmental faculty)
- As an National Science Foundation Program Officer, handled over 100 “standard” grant proposals each year, selecting reviewers and, based on analysis of reviews,

recommended which proposals to fund, managing an annual budget of \$13 million; as part of the VIGRE Management Team, rewrote the program solicitation (VIGRE is an infrastructure program); conducted site visits as part of the assessment of VIGRE proposals, managing a budget of \$16 million; led the panel reviewing CAREER grant proposals and, based on panelists' discussion, made recommendations for funding

- At Bristol, introduced and run an annual panel to discuss best practices, difficulties and successes in mathematics teaching; organised workshop for post-graduate students on how to give a mathematics talk to undergraduates; organised a workshop for post-graduate students on how to make a successful poster on mathematics research
- As Head of Pure Mathematics at Bristol, led the group in discussions regarding hiring strategy; led the group in discussions on restructuring our 1st year courses, and oversaw the restructuring (and wrote and taught one of the new courses, Foundations & Proof); introduced two new units, Topics in Modern Geometry, and Topics in Discrete Mathematics, team-taught by post-doctoral fellows; organise and oversee the team-teaching of Topics in Discrete Mathematics
- In 2012, co-founded the 1st Building Bridges: EU/US Summer School + Workshop on Automorphic Forms and Related Topics, held at the University of Aachen, Germany (with funding from NSF and University of Aachen); in 2014, co-organised the 2nd Building Bridges events, held at the University of Bristol, in partnership with the London Mathematical Society and the Clay Mathematics Institute (with additional funding from NSF and HIMR); in 2016, co-organised the 3rd Building Bridges events, held at the University of Sarajevo (with funding from NSF, HIMR, EMS, Foundation Compositio, NTF, University of Sarajevo); for 2018, co-organising the 4th Building Bridges events, to be held at Renyi Institute Budapest (with funding from NSF, HIMR, Foundation Compositio, NTF, Journal of Number Theory, Renyi Institute).