

Melanie Matchett Wood

Positions

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| University of California, Berkeley Chancellor's Professor | 2019-present |
| Princeton University Minerva Distinguished Visitor | Fall 2018 |
| University of Wisconsin-Madison Vilas Distinguished Achievement Professor | 2017-2019 |
| University of Wisconsin-Madison Professor | 2017 |
| American Institute of Mathematics Five-Year Fellow | 2009-2017 |
| University of Wisconsin-Madison Assistant Professor | 2011-2017 |
| Stanford University Szegő Assistant Professor | 2009-2011 |
| MSRI Research Member, Arithmetic Statistics Program | Spring 2011 |

Education

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|---|-----------|
| Princeton University Ph.D. in Mathematics | 2004–2009 |
| University of Cambridge Certificate of Advanced Study in Mathematics, with Distinction | 2003–2004 |
| Duke University B.S. with Highest Honors in Mathematics | 1999–2003 |

Selected Awards

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| AWM-Microsoft Research Prize in Algebra and Number Theory | 2018 |
| NSF CAREER Grant DMS-1652116 | 2017 |
| University of Wisconsin-Madison Vilas Early Career Investigator Award | 2017 |
| Packard Fellowship for Science and Engineering | 2015 |
| 18 awarded yearly to early career scientists and engineers in the U.S. | |
| Sloan Research Fellowship | 2015 |
| 126 awarded yearly to early career scientists in the U.S. and Canada | |
| National Science Foundation Grant DMS-1301690 | 2013 |
| Fellow of the American Mathematical Society | 2012 |
| inaugural class, the first year there was a fellows program | |
| National Science Foundation Grant DMS-1001083 | 2010 |
| American Institute of Mathematics Five-Year Fellow | 2009 |
| one or two fellowships awarded yearly for top mathematics Ph.D.'s in U.S. | |
| Clay Mathematics Institute Liftoff Fellow | 2009 |
| seven fellowships awarded that year for top mathematics Ph.D.'s in U.S. | |
| American Association of University Women Dissertation Fellowship | 2008 |
| the competition for these fellowships is among all disciplines | |
| Josephine De Kármán Dissertation Fellowship | 2008 |
| ten fellowships awarded that year to finishing Ph.D. candidates at U.S. institutions, in any discipline, with special consideration given to the humanities | |

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| National Defense Science and Engineering Graduate Fellowship | 2005 |
| AMS-MAA-SIAM Morgan Prize | 2003 |
| one given annually for outstanding research in mathematics by an undergraduate student in the U.S. or Canada, given jointly by the three mathematics professional societies | |
| Leslie Walshaw Prize, Examination Prize, Research Scholarship, and Senior Scholarship (for top results of Part III Mathematics examinations), Trinity College, University of Cambridge | 2004 |
| National Science Foundation Graduate Research Fellowship | 2003 |
| Gates Cambridge Scholarship | 2003 |
| forty-four full-cost scholarships for U.S. students to University of Cambridge awarded that year in all disciplines | |
| Fulbright Award to the United Kingdom (declined to accept Gates) | 2003 |
| all-discipline award | |
| Alice T. Schafer Prize | 2002 |
| one or two given yearly to a U.S. undergraduate woman for excellence in mathematics | |
| Putnam Fellow (top five) and Elizabeth Lowell Putnam Prize (top female) | 2002 |
| 9th place and Elizabeth Lowell Putnam Prize | |
| in annual Putnam Mathematical Competition for college students in U.S. and Canada | |
| International Mathematical Olympiad , 2 silver medals as member of 6 person US team 1998, 1999 | |
| U.S.A. Mathematical Olympiad , tied for first place | 1998 |

Papers

41. **“A predicted distribution for Galois groups of maximal unramified extensions,”** with Yuan Liu and David Zureick-Brown (2019), arxiv:1907.05002.
40. **“Moments and interpretations of the Cohen-Lenstra-Martinet heuristics,”** with Weitong Wang (2019), arxiv: 1907.11201.
39. **“An algebraic lifting invariant of Ellenberg, Venkatesh, and Westerland,”** (2019), preprint available on webpage.
38. **“On a conjecture for l -torsion in class groups of number fields: from the perspective of moments,”** with Lillian B. Pierce and Caroline L. Turnage-Butterbaugh, (2019), arXiv:1902.02008.
37. **“Cokernels of adjacency matrices of random r -regular graphs,”** with Hoi H. Nguyen, (2018), arXiv:1806.10068.
36. **“Random integral matrices: universality of surjectivity and the cokernel,”** with Hoi H. Nguyen, (2018), arXiv:1806.00596.
35. **“An effective Chebotarev density theorem for families of number fields, with an application to l -torsion in class groups,”** with Lillian B. Pierce and Caroline L. Turnage-Butterbaugh, to appear in *Inventiones Mathematicae*, (2017), arXiv:1709.09637.
34. **“Coincidences of homological densities, predicted by arithmetic,”** with Benson Farb and Jesse Wolfson, to appear in *Advances* (2016), arXiv:1611.04563.
33. **“Nonabelian Cohen-Lenstra Moments”** (including an appendix with Philip Matchett Wood), to appear *Duke Mathematical Journal*, arXiv:1702.04644.
32. **“Random integral matrices and the Cohen Lenstra Heuristics,”** to appear *American Journal of Mathematics*, arXiv:1504.04391.
31. **“A heuristic for boundedness of ranks of elliptic curves,”** with Jennifer Park, Bjorn Poonen, and John Voight, to appear *Journal of the European Mathematical Society*, Published online: 2019-05-21, DOI: 10.4171/JEMS/893.

30. **“The free group on n generators modulo $n+u$ random relations as n goes to infinity”**, with Yuan Liu, to appear *Journal für die reine und angewandte Mathematik (Crelle)*, Published online: 2018-10-30, DOI: 10.1515/crelle-2018-0025.
29. **“Cohen-Lenstra heuristics and local conditions,”** *Research in Number Theory*, (2018) 4:41.
28. **“On ℓ -torsion in class groups of number fields,”** with Jordan Ellenberg and Lillian B. Pierce, *Algebra & Number Theory* 11-8 (2017), 1739–1778.
27. **“The distribution of sandpile groups of random graphs,”** *Journal of the American Mathematical Society*, **30** (2017), pp. 915-958.
26. **“Nonabelian Cohen-Lenstra Heuristics over Function Fields,”** with Nigel Boston, *Compositio Mathematica* **153** (2017), no. 7, pp. 1372-1390.
25. **“Mass formulas for local Galois representations and quotient singularities II: dualities and resolution of singularities,”** with Takehiko Yasuda, *Algebra & Number Theory* 11-4 (2017), 817–840.
24. **“Gauss Composition for \mathbb{P}^1 , and the universal Jacobian of the Hurwitz space of double covers,”** with Daniel Erman, *Journal of Algebra*, 470 (2017) 320-352.
23. **“Irreducibility of Random Polynomials,”** with Christian Borst, Evan Boyd, Claire Brekken, Samantha Solberg, and Philip Matchett Wood, *Experimental Mathematics* 27 (2018) no.4 pp. 498–506.
22. **“Representations of integers by systems of three quadratic forms,”** with Lillian B. Pierce and Damaris Schindler, *Proceedings of the London Mathematical Society (3)* 113 (2016), no. 3, 289-344.
21. **“Asymptotics for number fields and class groups,”** in *Directions in Number Theory*, Springer (2016) pp. 291–339.
20. **“The distribution of \mathbb{F}_q points on cyclic ℓ -covers of genus g ,”** with Alina Bucur, Chantal David, Brooke Feigon, Nathan Kaplan, Matilde Lalín, and Ekin Ozman, *International Mathematics Research Notices* (2016) no. 14, 4297—4340.
19. **“Discriminants in the Grothendieck Ring,”** with Ravi Vakil, *Duke Mathematical Journal* 164 (2015), no. 6, 1139-1185.
18. **“Semiample Bertini theorems over finite fields,”** with Daniel Erman, *Duke Mathematical Journal* 164 (2015), no. 1, 1-38.
17. **“The distribution of points on superelliptic curves over finite fields,”** with GilYoung Cheong and Azeem Zaman, *Proceedings of the American Mathematical Society*, **143** no. 4 (2015), pp. 1365-1375.
16. **“A heuristic for the distribution of point counts for random curves over a finite field,”** with Jeffrey D. Achter, Daniel Erman, Kiran S. Kedlaya, David Zureick-Brown, *Philosophical Transactions of the Royal Society A*, (2015) **373**, no. 2040: 20140310.
15. **“Mass formulas for local Galois representations and quotient singularities I: A comparison of counting functions,”** with Takehiko Yasuda, *International Mathematics Research Notices* (2015) no. 23, 12590—12619.
14. **“On a Cohen-Lenstra Heuristic for Jacobians of Random Graphs”** with Julien Clancy, Nathan Kaplan, Timothy Leake, and Sam Payne, *Journal of Algebraic Combinatorics*, 42 (2015), no. 3, 701—723.
13. **“Parametrization of ideal classes in rings associated to binary forms,”** *Journal für die reine und angewandte Mathematik (Crelle)* 689 (2014), 169–199.
12. **“Counting polynomials over finite fields with given root multiplicities,”** with Ayah Almousa, *Journal of Number Theory*, 136C (2014), pp. 394–402.

11. “The distribution of the number of points on trigonal curves over \mathbb{F}_q ,” *International Mathematics Research Notices* (2012) no. 23, 5444–5456.
10. “Quartic rings associated to binary quartic forms,” *International Mathematics Research Notices* (2012) no. 6, 1300–1320.
9. “Gauss composition over an arbitrary base,” *Advances in Mathematics* 226 (2011) 1756–1771.
8. “Rings and ideals parametrized by binary n -ic forms,” *Journal of the London Mathematical Society* (2) 83 (2011) 208–231.
7. “Parametrizing quartic rings over an arbitrary base,” *Algebra and Number Theory* 5-8 (2011), 1069–1094.
6. “Mapping Incidences,” with Van H. Vu and Philip Matchett Wood, *Journal of the London Mathematical Society*. (2) 84 (2011) 433–44.
5. “On the probabilities of local behaviors in abelian field extensions,” *Compositio Mathematica* 146 (2010), no. 1, 102–128.
4. “Mass formulas for local Galois representations to wreath products and cross products,” *Algebra and Number Theory*, Vol. 2 (2008), No. 4, 391–405.
3. “The density of discriminants of S_3 -sextic number fields,” with Manjul Bhargava, *Proceedings of the American Mathematical Society*, 136 (2008), 1581–1587.
2. “Belyi-extending maps and the Galois action on dessins d’enfants,” *Publications of the Research Institute for Mathematical Sciences* 42 (2006), no. 3, 721–737.
1. “P-orderings: a metric viewpoint and the non-existence of simultaneous orderings,” *Journal of Number Theory* 99 (2003) 36–56.

Major Invited Lectures

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| Princeton University Minerva Distinguished Visitor Mini-course, 4 lectures..... | 2018 |
| University of Oregon Niven Lectures..... | 2018 |
| Stanford University Beatrice Yormark Distinguished Lecture..... | 2016 |
| John G. Kemeny Lectures, Dartmouth, three lectures..... | 2016 |
| Distinguished Women in Mathematics Lecturer, University of Texas at Austin..... | 2015 |
| Montreal CRM Summer School, four 1.5 hour lectures..... | 2014 |
| Arizona Winter School, five lectures..... | 2014 |
| Loeb Lecture, Washington University at St. Louis..... | 2014 |
| J. Sutherland Frame Lecture, MAA MathFest..... | 2012 |
| Joint Mathematics Meetings MAA Invited Address..... | 2011 |
| AMS Western Sectional Meeting Invited Address..... | 2010 |

Selected Invited Research Talks

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| Enumerative Arithmetic and the Cohen–Lenstra Heuristics, at Max Planck Institute in Bonn..... | 2019 |
| Harvard University Colloquium..... | 2019 |
| University of Michigan Colloquium..... | 2019 |
| University of Pennsylvania Algebra seminar..... | 2018 |
| Joint Columbia-NYU-CUNY New York Number Theory seminar..... | 2018 |
| Conference on open questions in cryptography and number theory at UC Irvine, Invited Speaker..... | 2018 |
| Arithmetic Geometry, Number Theory, and Computation at MIT, Invited Speaker..... | 2018 |
| Canadian Number Theory Association Plenary Speaker..... | 2018 |
| Algorithmic Number Theory Symposium Invited Speaker..... | 2018 |
| Duke Math Journal Conference..... | 2018 |
| Carnegie Mellon Colloquium..... | 2018 |

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| University of California, Berkeley Colloquium | 2018 |
| Columbia Algebraic Geometry Seminar | 2017 |
| Yale University Colloquium | 2017 |
| Yale University Algebraic Geometry Seminar | 2017 |
| University of Texas at Austin Number Theory Seminar | 2017 |
| University of Texas at Austin Group Theory Seminar | 2017 |
| Northwestern Colloquium | 2017 |
| MSRI Recent developments in Analytic Number Theory Workshop | 2017 |
| Invited Address, MAA Wisconsin Section Meeting | 2017 |
| University of Chicago Colloquium | 2017 |
| Caltech Colloquium | 2016 |
| Princeton University Colloquium | 2016 |
| Princeton University Number Theory Seminar | 2016 |
| 2016 Fields Medal Symposium | 2016 |
| Stanford University Number Theory Seminar | 2016 |
| Stanford University Combinatorics Seminar | 2016 |
| Rubinfest: L-functions and Arithmetic, Harvard University | 2016 |
| Conference on Arithmetic Statistics and the Cohen-Lenstra Heuristics, University of Warwick | 2016 |
| Joint Athens-Atlanta Number Theory Seminar, Georgia Tech | 2016 |
| Number Theory Seminar, University of Chicago | 2016 |
| Invited Lecture, AMS Algebraic Geometry Summer Institute, University of Utah | 2015 |
| Southern California Number Theory Day Invited Speaker | 2015 |
| Algebraic Geometry Northeastern Series Invited Speaker | 2015 |
| Brandeis-Harvard-MIT-Northeastern Joint Colloquium | 2015 |
| Rice University Colloquium | 2015 |
| Tufts University Colloquium | 2015 |
| Invited speaker, Northeast Probability Seminar at Columbia University | 2014 |
| IMA Additive and Analytic Combinatorics Workshop | 2014 |
| University of Illinois at Urbana-Champaign, Bateman-Halberstam Conference | 2014 |
| Marquette University Colloquium | 2014 |
| AIM Workshop: Arithmetic statistics over finite fields and function fields | 2014 |
| University of Michigan Algebraic Geometry Seminar | 2013 |
| Boston College-MIT Joint Number Theory Seminar | 2013 |
| University of North Carolina Number Theory Seminar | 2013 |
| Johns Hopkins-University of Maryland Algebra & Number Theory Day | 2013 |
| Collaborative Explorations and Developments in Arithmetic Research Conference | 2013 |
| Atkin Memorial Workshop on Cohen-Lenstra Heuristics | 2013 |
| University of Chicago Geometry/Topology Seminar | 2013 |
| University of Illinois-Chicago Algebraic Geometry Seminar | 2013 |
| University of Chicago Colloquium | 2012 |
| Upstate New York Number Theory Conference Invited Speaker | 2012 |
| Northern Illinois University Colloquium | 2012 |
| University of Wisconsin-Madison Colloquium | 2012 |
| Duke University Algebraic Geometry Seminar | 2011 |
| Women in Numbers 2, Banff International Research Station | 2011 |
| Western Algebraic Geometry Symposium | 2011 |
| AWM 40 years and counting Number Theory Session | 2011 |
| MSRI-Evans Lecture, University of California, Berkeley | 2011 |
| MSRI-Arithmetic Statistics Workshops, two invited talks | 2011 |
| Bay Area Algebraic Number Theory and Arithmetic Geometry Day | 2011 |
| MAA Invited Speaker in The Power and Beauty of Number Theory Session, JMM | 2011 |
| AWM Alice T. Schafer Mini-symposium, JMM | 2011 |
| Stanford University Algebraic Geometry Seminar | 2011 |
| Cornell University Number Theory Seminar | 2010 |
| University of Wisconsin-Madison Number Theory Seminar | 2010 |
| Workshop on Elliptic Curves and Computation | 2010 |

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| Northwestern Number Theory Seminar | 2010 |
| University of California Berkeley Commutative Algebra and Algebraic Geometry Seminar | 2009 |
| Québec-Vermont Number Theory Seminar at McGill | 2009 |
| Oberwolfach workshop: Explicit Methods in Number Theory | 2009 |
| Higher Degree Forms Conference, University of Florida | 2009 |
| Rutgers University Colloquium | 2009 |
| Rutgers University Number Theory Seminar | 2009 |
| Stanford University Number Theory Seminar | 2009 |
| University of Texas at Austin Algebra, Number Theory, and Combinatorics Seminar | 2009 |
| Texas A&M Number Theory Seminar | 2009 |
| University of Wisconsin Madison Number Theory Seminar | 2008 |
| University of Arizona Number Theory Seminar | 2007 |
| Rings of Low Rank Workshop, Lorentz Center, University of Leiden, Netherlands | 2006 |
| Institute for Advanced Study Women's Program | 2006 |
| University of California-Berkeley Number Theory Seminar | 2005 |
| University of Pennsylvania Galois Seminar | 2005 |
| American University Colloquium | 2004 |

Selected Student and Public Talks

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| U.S. Academic Decathlon Speaker at Welcome Ceremony | 2017 |
| Young Mathematicians Conference Plenary Speaker | 2016 |
| Association of Colleges in the Chicagoland Area, 2 talks to undergraduates | 2013 |
| Duke University Mathematics Union Undergraduate Talk | 2011 |
| Bay Area Mathematical Adventures | 2009 |
| Keynote Address, 37th Biennial Convention, Kappa Mu Epsilon | 2009 |
| Princeton Sigma Xi Public Science Lecture | 2009 |
| USA Mathematical Olympiad Awards Ceremony Keynote Speaker | 2008 |
| Lecture at opening of MAA Carriage House Conference Center | 2007 |
| Colloquium and Harry S. Kieval Lecture, Humboldt State University | 2007 |
| University of Minnesota Duluth Colloquium and Public Talk | 2006 |
| Bay Area Mathematical Olympiad Awards Ceremony Keynote Speaker | 2005 |
| New York Metropolitan MAA Section Meeting Invited Major Session Speaker | 2005 |
| American University Public Talk | 2004 |

Service

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| Algebra and Number Theory Editorial Board | 2019-present |
| Research in Number Theory Editorial Board | 2019-present |
| Cole Prize Selection Committee | 2019-present |
| Graduate Texts in Mathematics Advisory Board | 2019-present |
| American Mathematical Society Council | 2019-present |
| AMS Committee on the Profession | 2019-present |
| AWM-Microsoft Research Prize Committee | 2018-present |
| Regeneron Science Talent Search (formerly Westinghouse, Intel) Judging Panel (national research competition for high schoolers) | 2015-present |
| Editorial Board, Journal de Théorie des Nombres de Bordeaux | 2015-2019 |
| University of Wisconsin-Madison Women Faculty Mentoring Program Advisory Board | 2018-2019 |
| Undergraduate research coordinator for UW-Madison's NSF Research and Training Grant in Number Theory, Algebraic Geometry, and Applied Algebra | 2015-2019 |
| Assistant Director, Wisconsin Mathematics, Engineering, and Science Talent Search | 2012-2019 |

Panel member for National Science Foundation review panel .. 2010-11, 2013-14, 2015-16, 2017-18, 2018-19
 Organizer, Workshop on Arithmetic Topology at PIMS 2018-2019
 AMS Representative on the Frank and Brennie Morgan Prize Committee 2016-2019
 Organizer, Conference on Arithmetic of Algebraic Curves at University of Wisconsin-Madison ... 2017-2018
 Member, MAA Subcommittee on the United States Math Olympiad 2016-2017
 University of Wisconsin Institutional Nominations and Internal Competitions Committee 2016-2017
 Reviewer for NSA Mathematical Sciences Grant Program 2012-2016
 Reviewer for Banff International Research Station 2015-2016
 Developed research problem for and co-organized research group for Women in Numbers 2 2011
 Mathcounts Board of Directors 2007-2009
 Noetherian Ring Co-chair, Princeton University 2006-2009
 Institute for Advanced Study Women in Science Seminar Co-organizer 2007

PhD Students

Jiuya Wang, Foerster-Bernstein Postdoctoral Fellow and Phillip Griffiths Assistant Research Professor at Duke University 2018
 Megan Maguire, Postdoc at University of California-Irvine 2018
 Weitong Wang, in progress

Postdocs

Joseph Gunther, currently Postdoc at Université Paris-Sud (Paris 11/Orsay)
 Mark Shusterman, currently Postdoc at the University of Wisconsin-Madison

Mentoring Undergraduate Research

Mentored 34 undergraduates in mathematics research 2004-present