

CURRICULUM VITAE

Jennifer Paulhus

Current Address:

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GitHub: <http://www.github.com/jenpaulhus>

Interests: algebraic number theory, arithmetic geometry, elliptic and hyperelliptic curves, Jacobian varieties, representation theory, automorphism groups of Riemann surfaces

Academic Degrees:

Ph.D. in Mathematics

University of Illinois at Urbana-Champaign (UIUC), May 2007 Advisor: Iwan Duursma

B.A. in Mathematics with honors, Computer Science concentration, magna cum laude

College of the Holy Cross, May 1999

Employment:

Associate Professor, Grinnell College, May 2017–present.

Assistant Professor, Grinnell College, August 2011–May 2017.

Assistant Professor, Villanova University, August 2010–May 2011.

Assistant Professor-Term Appointment (postdoc), Kansas State University,
August 2007–August 2010.

Other Employment:

Adjunct Research Staff Member, Center for Communications Research, Summers 2012, 2014,
and 2019

Americorps Member, Americorps/CHART Program in Champaign-Urbana, Illinois,
August 2000–July 2001

Refereed Research Publications: ¹

S.A. Broughton, C. Camacho, J. Paulhus, R. Winarski, and A. Wootton. Using strong branching to find automorphism groups of n -gonal surfaces. *Albanian Journal of Mathematics, Special issue in honor of Kay Magaard* 12 (1): 89–129, 2018.

J. Paulhus and A. Rojas. Completely decomposable Jacobian varieties in new genera. *Experimental Mathematics* 26 (4): 430–445, 2017.

Extra data and code: <http://paulhus.math.grinnell.edu/completedec.html>

A. Fischer, M. Liu, and J. Paulhus. Jacobian Varieties of Hurwitz Curves with Automorphism Group $\mathrm{PSL}(2, q)$. *Involve, a Journal of Mathematics*, 9-4: 639–655, 2016. Research with Grinnell undergraduates through a Mentored Advanced Project.

J. Paulhus. Elliptic factors in Jacobians of hyperelliptic curves with certain automorphisms. *ANTS X: Proceedings of the Tenth Algorithmic Number Theory Symposium*. Mathematical Sciences Publishers. Everett Howe and Kiran Kedlaya (Eds.), 2013.

Errata available at <http://paulhus.math.grinnell.edu/errata.pdf>

¹Copies of most papers and preprints are at <http://paulhus.math.grinnell.edu/research.html>

Refereed Research Publications, continued:

- J. Bourgain, T. Cochrane, J. Paulhus, and C. Pinner. On the parity of k -th powers mod p : A generalization of a problem of Lehmer. *Acta Arithmetica*, 147 (2): 173–203, 2011.
- L. Berger, J.-L. Hoelscher, Y. Lee, J. Paulhus and R. Scheidler. The ℓ -rank structure of a global function field. *Women in Numbers: Research Directions in Number Theory*. Fields Institute Communications (60): 145–166, 2011.
- J. Bourgain, T. Cochrane, J. Paulhus, and C. Pinner. Decimations of l -sequences and permutations of even residues mod p . *Society of Industrial and Applied Mathematics Journal on Discrete Mathematics*, 232 (2): 842–857, 2009.
- J. Paulhus. Decomposing Jacobians of curves with extra automorphisms. *Acta Arithmetica*, 132 (3): 231–244, 2008.

Refereed Expository Papers:

- J. Paulhus. Group actions and Riemann surfaces. To appear in *Research Connections: A celebration of work by affiliates of Carleton College's Summer Mathematics Program*, Mathematical Association of America (MAA).

Preprints:

- M. Carvacho, J. Paulhus, T. Tucker, and A. Wootton. Non-abelian simple groups act with almost all signatures. *Submitted*.
- M. Carvacho, J. Paulhus, T. Tucker, and A. Wootton. Classifying p -groups which act with almost all signatures. *In Preparation*.
- J. Paulhus. A database of group actions on Riemann surfaces.
Description of the mathematics underpinning the data on group actions of Riemann surfaces available at: <http://www.lmfdb.org/HigherGenus/C/Aut/>
Computer code: <http://www.github.com/jenpaulhus/group-actions-RS>

Other Publications:

- J. Paulhus. Branching data for curves up to genus 48. arXiv:1512.07657 [math.AG] at <http://arxiv.org/abs/1512.07657>, 2015.
Descriptions of computations of monodromy using work of Thomas Breuer.
Data: <http://paulhus.math.grinnell.edu/monodromy.html>
Computer code: <https://github.com/jenpaulhus/breuer-modified>
- A. Bennett, R. Manspeaker, R. Natarajan, and J. Paulhus. Studio College Algebra at Kansas State University. *Moving Forward: Innovations in Introductory Collegiate Mathematics*. MAA Reports. W.E. Haver and S.L. Ganter (Eds.), Washington, DC: MAA. 99-105, 2011.
- J. Paulhus. *Elliptic factors in Jacobians of low genus curves*. Ph.D. dissertation, University of Illinois at Urbana-Champaign, 2007.
- C. Girod, M. Lepinski, J. Mileti, and J. Paulhus. Cwatset isomorphism and its consequences. *Rose-Hulman Mathematical Sciences Technical Report Series*, vol. 1, 2000.

Invited Talks:

- Joint American Mathematical Society (AMS)/MAA Meeting, Denver, January 2020
AMS Special Session on Rational Points on Algebraic Varieties: Theory and Computation
AMS Fall Central Sectional Meeting, September 2019
Special Session on Geometry and Topology in Arithmetic

Invited Talks, continued:

Arithmetic of Low-Dimensional Abelian Varieties, June 2019
The Institute for Computational and Experimental Research in Mathematics (ICERM)
Canadian Mathematical Society Winter Meeting, December 2018
Special Session on Explicit Methods in Arithmetic Geometry
AMS Spring Western Sectional Meeting, April 2018
Special Session on Automorphisms of Riemann Surfaces and Related Topics
Iberoamerican Congress on Geometry, January 2018
Special Session on Abelian Varieties
Joint AMS/MAA Meeting, San Diego, January 2018
AMS Special Session on A Showcase of Number Theory in the Liberal Arts
Geometry at the Frontier II: Research Workshop, Pucón, Chile, November 2017
Universidad de Talca Mathematics Department Colloquium, October 2015
AMS Fall Central Sectional Meeting, September 2014
Special Session on Number Theory
Applications of Computer Algebra, July 2014
Special Session on Group Actions in Algebra and Geometry
AMS Spring Central Sectional Meeting, Iowa State University, April 2013
Special Session on Computational Advances on Special Functions and Tropical Geometry
Universidad de Chile Mathematics Department Colloquium, March 2013
Illinois Wesleyan Science Division Colloquium, November 2012
University of California at Berkeley Number Theory Seminar, October 2012
ANTS X: Tenth Algorithmic Number Theory Symposium, July 2012
Joint AMS/MAA Meeting, Boston, January 2012
AMS Special Session on Arithmetic Geometry
Pacific Northwest Number Theory Conference, May 2011
Center for Communication Research-Princeton Colloquium, March 2011
Bryn Mawr College Colloquium, November 2010
Temple University Number Theory Seminar, November 2010 and February 2011
Joint AMS/MAA Meeting, San Francisco, January 2010
MAA-AMS-MER Invited Paper Session on Mathematics and Education Reform
AMS Fall Eastern Section Meeting, Penn State University, October 2009
Special Session on Automorphisms of Riemann Surfaces and Related Topics
Iowa State University Colloquium, October 2009
University of Calgary Number Theory Seminar, July 2009
Joint AMS/MAA Meeting, Washington, D.C., January 2009
AMS Special Session on Group Actions on Curves
University of Georgia Number Theory Seminar, December 2008
Dartmouth College Colloquium, May 2008
University of Nebraska at Lincoln Colloquium, April 2008
Joint AMS/MAA Meeting, San Diego, January 2008
AMS Special Session on Low Genus Curves and Applications
Number Theory Seminar, Colorado State University, October 2007
Joint AMS/MAA Meeting, New Orleans, January 2007
AMS Special Session on Arithmetic of Function Fields

Other Conference Talks:

Canadian Number Theory Association Meetings, July 2006, July 2008, and June 2016
International Congress of Mathematicians, Seoul, South Korea, August 2014
ANTS XI poster session, GyeongJu, South Korea, August 2014
Western Number Theory Conference, December 2008 and 2010

Grants, Honors, and Awards:

Frank and Roberta Furbush Scholar in Mathematics, 2017-2018
Grinnell College endowed honorary fund to support faculty scholarship during a sabbatical.
National Science Foundation and National Security Agency conference grants, 2018
Co-PI on two grants totaling \$25,000 to support travel for students and recent graduates to attend the 13th Algorithmic Number Theory Symposium at the University of Wisconsin, Madison in July 2018.
Harris Faculty Fellowship, 2015-2016
Year long, competitive junior faculty research leave through Grinnell College.
Heath Visiting Professor, Spring 2015
Brought an international scholar, Dr. Anita Rojas, to Grinnell College for a semester.
American Mathematical Society travel grant, August 2014
Travel to the International Congress of Mathematicians.
UIUC Mathematics Department Mathematics Instructional Award, Spring 2004

Select Grinnell College Service:

Committee Member: Admissions and Financial Aid Committee
Committee Member: Web Governance Committee
Search Committee Member: Director of Corporate, Foundation and Government Relations
Search Committee Member: Vice President of Academic Affairs and Dean of the College
Organizer: Early Career Faculty Group

Professional Service:

Associate Editor: L-functions and Modular Forms Database, <http://www.lmfdb.org>
Program Committee Member: ANTS XIV, International conference held at the University of Auckland, New Zealand, Summer 2020
Co-organizer: AMS Special Session on Automorphisms of Riemann Surfaces, Subgroups of Mapping Class Groups and Related Topics, AMS Spring Sectional Meetings, March 2020
Co-organizer: ANTS XIII, International conference held at the University of Madison, Wisconsin, July 2018
Paper Referee: ANTS XI, Bulletin of the Korean Mathematical Society, International Journal of Number Theory, Mathematical Journal of Madrid Academy of Sciences, Quarterly Journal of Mathematics, and Transactions of the AMS
Ph.D. Defense Committee Member: Robert Auffarth, Pontifica Universidad Católica de Chile, January 2014
Reviewer: AMS Mathematical Reviews, 2008-2012
Co-organizer: AMS Special Session on Arithmetic Geometry, AMS/MAA Meetings, January 2010 and 2012

Teaching:

Grinnell College

- Tutorial—Almost Heaven: West Virginia
- Calculus I
- Calculus II
- Demystifying Mathematics
- Linear Algebra
- Combinatorics
- Elementary Number Theory
- Foundations of Abstract Algebra
- Algebraic Number Theory
- Field Theory
- Elliptic Curves

Villanova University (+ indicates graduate course)

- Number Theory⁺
- Modern Algebra I
- Calculus I

Kansas State University: Postdoc (+ indicates graduate course)

- Introduction to the Theory of Groups⁺
- Topics in Number Theory: Elliptic Curves⁺
- Discrete Mathematics
- Introduction to Contemporary Mathematics
- Mathematics for Elementary School Teachers
- College Algebra

UIUC: Graduate Teaching Assistant (as primary instructor)

- Calculus for Business, large lecture and small class
- A Mathematical World
- College Algebra
- Introductory Matrix Theory

Workshops and Courses:

Connections in the LMFDB, Institute of Advanced Study, March 2019

Geometry at the Frontier II: School, Pucón, Chile, November 2017

Gave a course on “Elliptic curves and an introduction to abelian varieties”.

Symmetries of Surfaces, Maps and Dessins, Banff International Research Station, Fall 2017

L-Functions and Modular Forms Database, University of Bristol, March 2016

SMPosium, Carleton College, July 2011

Women in Numbers, Banff International Research Station, November 2008

Rational Points on Curves, Banff International Research Station, February 2007

Arizona Winter School, March 2006

Membership:

American Mathematical Society

Phi Beta Kappa

Computer Proficiencies:

Magma, GAP, Maple, Sage, Python, Flask, PostgreSQL