Kirsten Graham Wickelgren

Curriculum Vitae

Education

- **Stanford University**, Stanford, California.
  Ph.D. in mathematics 2009.
  Thesis: *Lower central series obstructions to homotopy sections of curves over number fields*.
  Advisor: Gunnar Carlsson.
- **L'École Normale Supérieure**, Paris, France.
  Titre d'Ancienne Élève de l'École Normale Supérieure 2004.

- **Harvard University**, Cambridge, Massachusetts.
  A.B.-A.M. magna cum laude 2003 A.M. in mathematics.

Languagues

- English, first language.
- French, quite good.

Employment

- **Associate Professor**, Georgia Institute of Technology, 2018–present.
- **Assistant Professor**, Georgia Institute of Technology, 2013–2018.
- **American Institute of Math 5-year Fellow**, Harvard University, 2009–2013.

Publications and Preprints

Up-to-date information can be found under papers at `http://people.math.gatech.edu/~kwickelgren3/`.

- *An Arithmetic Count of the Lines Meeting Four Lines in* $\mathbb{P}^3$ with Padmavathi Srinivasan, arXiv and submitted, 2018.
- *The Galois Action on the Lower Central Series of the Fundamental Group of the Fermat Curve* with Rachel Davis, and Rachel Pries, arXiv and submitted, 2018.
- *Operad Structure on* π_1*-sections of* Conf_n, with Craig Westerland, Oberwolfach Report 1816a, preliminary version available at `https://www.mfo.de/occasion/1816a/www_view`, workshop April 15-21, 2018.

- *An Arithmetic Count of the Lines on a Smooth Cubic Surface* with Jesse Kass, arXiv and submitted, 2017.
- *An Étale Realization Functor Which Does Not Exist* with Jesse Kass, New Directions in Homotopy Theory, proceedings of the second Mid-Atlantic Topology Conference, edited by N. Kitchloo, M. Merling, J. Morava, E. Riehl, W.S. Wilson, Contemporary Mathematics, Volume 707, p.11-31, 2018.
- *The Galois Action and Cohomology of a Relative Homology Group of Fermat Curves*, with Rachel Davis, Rachel Pries, and Vesna Stojanoska, J. Algebra **505**, 2018, 33–69.
- *The Class of Eisenbud – Khimshiashvili – Levine is the Local A1-Brouwer Degree*, with Jesse Kass, to appear in Duke Mathematical Journal 2018, originally posted to arXiv in 2016.
- $\mathbb{A}^1$*-Milnor Number*, with Jesse Kass, Oberwolfach Report 35(2016), 19 August, 2016.
- *Classification of Problematic Subgroups of* $U(n)$ with Julie E. Bergner, Ruth Joachimi, Kathryn Lesh, and Vesna Stojanoska, to appear in Transactions of the AMS, 2017.
- *Massey Products* $\langle y, x, x, \dots, x, x, y\rangle$ *in Galois Cohomology via Rational Points*, Journal of Pure and Applied Algebra, Volume 221, Issue 7, July 2017, pages 1845-1866.
- *A Classical Proof that the Algebraic Homotopy Class of a Rational Function is the Residue Pairing* with Jesse Kass, ArXiv and submitted, 2016.
- *The Simplicial Suspension Sequence in* $\mathbf{A}^1$*-homotopy*, with Aravind Asok and Ben Williams, Geometry & Topology 21-4 (2017), 2093–2160.
- *What is an anabelian scheme?* Notices of the AMS, March 2016, Volume 63 No 3, p. 285-286.
- *Desuspensions of* $S^1 \wedge \mathbb{P}^1_{\mathbb{Q}} - \{0, 1, \infty\}$, International Journal of Mathematics, June 2016, Vol. 27, No. 07.
- *The Simplicial EHP Sequence in* $\mathbf{A}^1$*-Algebraic Topology*, with Ben Williams, accepted for publication in Geometry & Topology, 2018.
- *Splitting Varieties for Triple Massey Products*, with Michael J. Hopkins, Journal of Pure and Applied Algebra 219 (2015), pp. 1304-1319.
- *An Abel map to the compactified Picard scheme realizes Poincaré duality*, with Jesse Kass, Algebraic & Geometric Topology 15-1 (2015), 319–369.
- *Fixed points of p-toral groups acting on partition complexes* with Julie E. Bergner, Ruth Joachimi, Kathryn Lesh, and Vesna Stojanoska, Contemporary Math. 641 Women in Topology: Collaborations in Homotopy Theory, AMS, 2015.
- *2-Nilpotent Real Section Conjecture*, Mathematische Annalen: Vol. 358, Issue 1 (2014), pp. 361-387.
- *Cartier's first theorem for Witt vectors on* $\mathbb{Z}^n_{\geq 0}$, Algebraic Topology: Applications and New Directions, Stanford Symposium 2012, Ulrike Tillmann, Soren Galatius, Dev Sinha editors, Contemporary Mathematics 620, AMS, 2014.
- *Grothendieck's Anabelian Conjectures*, The Harvard College Mathematics Review, Faculty Feature Article, Vol. 5, 2013, p. 77-83.
- n*-Nilpotent obstructions to* π_1*-sections of* $\mathbf{P}^1 - \{0, 1, \infty\}$ *and Massey products*, Advanced Studies in Pure Mathematics 63, 2012, Proceedings for Conferences in Kyoto, pp 579-600.

- *Universal Covering Spaces and Fundamental Groups in Algebraic Geometry as Schemes*, with Ravi Vakil, Journal de Théorie des Nombres de Bordeaux, 23 no. 2 (2011), p.489-526.

Grants

- co-PI NSF DMS-1745583 *RTG: Georgia Tech Geometry and Topology*, 2017-2022.
- NSF DMS-1552730 *CAREER: Etale and Motivic Homotopy Theory and Applications to Arithmetic Geometry*, 2016-2021.
- NSF DMS-1406380 *Homotopy Theory of Schemes, Grothendieck's Anabelian Program, and Rational Points*, 2014-2017.

Academic Honors

- American Institute of Mathematics 5-year Fellowship: 2009
- Stanford Graduate Research Fellowship: 2003
- National Science Foundation Graduate Research Fellowship: 2003
- Harvard-École Normale Supérieure Exchange Fellowship: 2003
- Phi Beta Kappa (Harvard University): 2002
- John Harvard Scholarship (Harvard University): 2001, 2002
- Detur Prize (Harvard University): 2000
- Intel Science Talent Search Finalist (formerly Westinghouse Science Talent Search):1999.
  Paper: *Re-calculation of the deflection of light by the sun based on an equation from string theory*.
  Advisor: Brian Greene.

Teaching

Up-to-date information can be found under Teaching at `http://people.math.gatech.edu/~kwickelgren3/`.

- Professor, Georgia Institute of Technology, Math 6122, Algebra II (graduate) , Spring 2018.
- Professor, Georgia Institute of Technology, Math 4431, Introduction to Topology, Fall 2017.
- Professor, Georgia Institute of Technology, Math 6121, Algebra I (graduate), Fall 2016.
- Professor, Georgia Institute of Technology, Math 4320, Complex Analysis, Fall 2015.
- Professor, Georgia Institute of Technology, Math 8803, Stable Homotopy Theory (graduate), Spring 2015.
- Professor, Georgia Institute of Technology, Math 6441, Algebraic Topology (graduate), Fall 2014.

- Professor, Georgia Institute of Technology, Math 2406, Vector Spaces, Fall 2013.
- Professor, Harvard University, Math 231br: Advanced Algebraic Topology (graduate), Spring 2013.
- Professor, Harvard University, Math 131: Topology I, Fall 2011.
- Professor, Harvard University, Math 137: Algebraic Geometry, Spring 2010.
- Teaching Assistant, Stanford University, Math 51: Linear Algebra and Differential Calculus of Several Variables, Fall 2007.
- Course Assistant, Harvard University, Math 113: Complex Analysis, Fall 2001.

Graduate students

- Sabrina Pauli, second year, University of Oslo, co-advising with Paul Arne Østvaer.
- Stephen McKean, second year, Georgia Institute of Technology.
- Thomas Brazelton, first year, co-advising with Mona Merling, University of Pennsylvania.

Conferences organized

- **Connections for Women: Derived Algebraic Geometry, Birational Geometry, and Moduli Spaces** January 28-30, 2019 at MSRI, Berkeley, California, co-organized with Julie Bergner, Antonella Grassi, and Bianca Viray.
- **Special Session on Homotopy Theory** April 14-15, 2018 at Vanderbilt University, co-organized with Anna Marie Bohmann.
- **Nilpotent Fundamental Groups** Banff International Research Station, June 18-23, 2017, co-organized with Ján Mináč, Florian Pop, and Adam Topaz.
- **TAAAG: Topological Approaches to Algebra and Arithmetic Geometry** September 2-4, 2016, co-organized with Ben Antieau, and Danny Krashen.
- **2016 West Coast Algebraic Topology Summer School** on interactions between algebraic topology and number theory in chromatic homotopy theory. August 8-13, 2016. co-organizer.
- **Introduction to unstable motivic homotopy theory** Workshop June 10-12, 2016, co-organized with Ben Antieau, Marc Levine, and Ben Williams.
- **AMS special session on rational points on varieties.** January 5-6, 2012. Co-organizer with Jennifer Balakrishnan, Bjorn Poonen, and Bianca Viray.

Outreach and Undergraduate research supervised

- **Mathematics Employment Experience for High School Students**, Georgia Institute of Technology, on-going and June 11-15 2018 and July 10-14 2017, co-organizing with Latricia Gladden, and Alicia Scott. `http://people.math.gatech.edu/~kwickelgren3/MEEHSS-web-page/MEEHSS.html`

- **REU** Mentor to Brandon Boggess, Research project on splitting varieties, supported by an REU supplement to NSF DMS-1406380, Summer 2015. Brandon Boggess's paper on this work *Splitting Varieties for Cup Products with $\mathbb{Z}/3$-Coefficients* has been published in the Journal of Number Theory, 169C (2016), 388-405.
- **Mathcamp**, July 3-7, 2012.
- **PROMYS** program in mathematics for young scientists. Mentor 2012. Project on random involutions.
- **PROMYS** program in mathematics for young scientists. Mentor 2010. Project on real algebraic curves.

Talks

- 3/25-29/19 (Expected), MSRI: Derived Algebraic Geometry and Applications, Berkeley CA.
- 3/2-6/19 (Expected), Arizona Winter School: interactions between algebraic topology and arithmetic geometry, University of Arizona.
- 9/4/18, Math Department Talk, Duke University, NC USA.
- 8/17/18, Motivic Homotopy Theory, Newton Institute, Cambridge UK.
- 7/9-13/18, Homotopy Theory and Arithmetic Geometry, Imperial College London.
- 6/28/18, Motivic Homotopy of Spheres, Freie Universitaet Berlin.
- 6/18/18, Motivic Enumerative Geometry, Essen.
- 4/15/18, AMS South-East Sectional Invited Address, Vanderbilt, Nashville, TN.
- 3/20/18, MSRI: Structures in Enumerative Geometry, Berkeley, CA.
- 3/7/18, Seminar for Women in Math in Atlanta, Georgia Tech.
- 2/28/18, Topology Seminar, University of Chicago.
- 2/27/18, Topology Seminar, Northwestern University.
- 11/14/17, Algebra Seminar, Emory University.
- 11/8/17, Algebraic Geometry Seminar, University of Michigan.
- 10/11/17, Topology Seminar, University of Rochester.
- 9/22/17, Étale and Motivic Homotopy, Heidelberg, Germany.
- 7/25/17, Mathematical Congress of the Americas: special session on algebraic cycles, Montreal, CA.
- 4/28/17, Algebraic Geometry Seminar, Columbia University.
- 3/30/17, MSRI Hot-Topics Periods, Berkeley CA.
- 3/13/17, Algebro-geometric and Homotopical Methods, Institute Mittag-Leffler, Sweden.
- 2/15/17, Homotopy and Arithmetic 3, Imperial college, London.
- 9/10/16, Anabelian Geometry, Burlington, VT.
- 7/21/16, MFO Topologie, Oberwolfach, Germany.
- 7/23/16, Motivic Homotopy Groups of Spheres, Essen Germany.
- 6/15/16, Equivariant Derived Algebraic Geometry, American Institute of Mathematics.

- 11/13/15, 24th NRW Topology Meeting, Bochum, Germany.
- 8/20/15, K-theory, Cyclic Homology, and Motives: a conference in celebration of Weibel's 65th Birthday, Rutgers.
- 7/20/15, AMS Summer Institute in Algebraic Geometry, University of Utah.
- 5/13/15, K-theory Future Directions, Columbus.
- 5/6/15, Arithmetic and Algebraic Differentiation in honor of Alexandru Buium, Berkeley.
- 4/27/15, University of Minnesota Topology Seminar, Minneapolis.
- 4/25/15, Mid-Adlantic Topology Seminar in Honor of Nick Kuhn's 60th Birthday, Charlottesville.
- 1/13/15, JMM Special Session Recent Developments in Algebraic Number Theory, San Antonio.
- 11/8/14, JHU-UMD Algebra and Number Theory Day, College Park.
- 9/3/14, Vector Bundles and Algebraic Topology, Berlin.
- 7/11/14, Algebra Seminar Frankfurt.
- 7/1/14, Regensberg SFB.
- 6/4/14, Motivic Homotopy Groups of Spheres, Essen.
- 4/11/14, University of Western Ontario Algebra Seminar.
- 4/7/14, MSRI Evan's lecture.
- 3/27/14, Etale and Motivic Homotopy Theory, Heidelberg.
- 3/19/14, Fukuoka Soft Research Park, Low dimensional topology and number theory vi.
- 3/26/14, University of British Columbia topology seminar.
- 2/4/14, University of Chicago topology seminar.
- 2/3/14, Northwestern University topology seminar.
- Mini-course 1/23/14-1/24/14, MSRI Algebraic topology: Connections for Women.
- 11/9/13, University of South Carolina, Southeast commutative algebra and algebraic geometry.
- 11/5/13, Joint Athens-Atlanta Number theory seminar.
- 10/25/13, University of Virginia algebra seminar.
- 5/29/13, University of Southern California, Homotopical Methods in Algebraic Geometry.
- 5/11/13, University of Kentucky, Midwest Topology Seminar.
- 3/1/13, University of Wisconsin, Colloquium.
- 1/29/13, Wayne State University, Topology Seminar.
- 1/14/13, University of Western Ontario, Geometry and Topology Seminar.
- 11/26/12, MIT, Topology Seminar.
- 10/2/12, MIT, Number Theory Seminar.
- 7/23/12, Stanford University, Stanford Symposium on Algebraic Topology.
- 6/25/12, Institut de Mathématiques de Bordeaux, conference on Galois Covers and Deformations.

- 6/1/12, Imperial College London, Workshop on Arithmetic Geometry and Homotopy Theory.
- 3/10/12, Southern California Algebraic Geometry Seminar.
- 3/9/12, University of Southern California, Algebra Seminar.
- 3/5/12, Johns Hopkins, Topology Seminar.
- 3/1/12, Emory, Colloquium.
- 2/15/12, Université de Montréal, Job-candidate talk.
- 2/8/12, University of Michigan, Algebraic Geometry Seminar.
- 1/27/12, University of Pennsylvania, Special lecture.
- 1/19/12, Colorado State University, Job-candidate talk.
- 12/8/11, Georgia Institute of Technology, Job-candidate talk.
- 12/6/11, Emory, Colloquium.
- 11/7/11, MIT, Topology Seminar.
- 10/25/11, Berkeley, Number Theory Seminar.
- 9/23/11, Brown University, Algebraic Geometry Seminar.
- 3/17/11, Georgia Institute of Technology, Algebra Seminar.
- 2/11/11, Wesleyan University, Algebra Seminar.
- 12/2/10, McGill University, Québec-Vermont Number Theory Seminar.
- 11/19/10, Case Western Reserve, Colloquium.
- 11/8/10, MIT, Topology Seminar.
- 10/27/10, Mathematical Society of Japan Seasonal Institute at RIMS Kyoto, Development of Galois-Teichmüller theory and anabelian geometry.
- 4/29/10, Pennsylvania State University, Number Theory Seminar.
- 4/19/10, Harvard University, Faculty Colloquium.
- 3/23/10, Rice University, Algebraic Geometry Seminar.
- 2/9/2010, Universität Heidelberg MATCH, The arithmetic of fundamental groups PIA 2010.
- 11/10/09, Harvard, Harvard-MIT Algebraic Geometry Seminar.
- 11/6/09, University of Madison-Wisconsin, Midwest Number Theory Day.
- 10/26/09, MIT, Topology Seminar.
- 7/28/09, Newton Institute, Non-Abelian Fundamental Groups in Arithmetic Geometry: Introductory Workshop.
- 4/7/09, University Illinois Urbana-Champaign, Topology Seminar.
- 9/25/09, Brandeis, Everytopic Seminar.
- 11/4/08, University of Chicago, Topology Seminar.
- 11/3/07, University of Wisconsin, Graduate Student Conference in Number Theory.
- 10/26/2007, Stanford University, Algebraic Geometry Seminar.

Older

- **Honors expository undergraduate thesis.** Harvard University. Spring 2003.
  Billiards in Polygons. Advisor: Curtis McMullen.
- **Summer Research Experience for Undergraduates:** Williams College. Summer 2002.
  Ergodic theory group. Advisor: Cesar Silva.
- **Summer Research Experience for Undergraduates:** Cornell University. Summer 2001.
  Linear Transformations Preserving the Voronoi Polyhedron. Advisor: Konstantin Rybnikov.
- **Global Science Scholar Summer Internship.** Lucent Technologies. Summer 2000.
  Minimal cost networks. Advisor: Iraj Saniee.

References

Available upon request.