

Eric Samperton

Curriculum Vitae

University of California, Davis
Mathematics Graduate Program
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Employment

- 2019–2022 **J.L. Doob Research Assistant Professor**, *University of Illinois at Urbana-Champaign*.
2018–2019 **Visiting Assistant Professor**, *University of California, Santa Barbara*.

Education

- 2012–2018 **Ph.D.**, *University of California, Davis*, Mathematics.
Advisor: Greg Kuperberg. Projected graduation: June 2018.
2008–2012 **B.S.**, *California Institute of Technology*, Mathematics with a minor in English.

Research

Computational complexity of problems and invariants in low-dimensional topology. Quantum algebra, quantum topology and quantum computing. Geometric group theory and dynamics.

Writing

Links to preprints are available on my webpage.

- *Coloring invariants of knots are often intractable*. With Greg Kuperberg. In preparation.
- *Computational complexity of enumerative 3-manifold invariants*. Ph.D. thesis. arXiv:1805.09275.
- *Schur-type invariants of branched G -covers of surfaces*. arXiv:1709.03182. Submitted.
- *Computational complexity and 3-manifolds and zombies*. With Greg Kuperberg. arXiv:1707.03811. Accepted for publication in *Geometry & Topology*.
- *Spaces of invariant circular orders of groups*. With Hyungryul Baik. arXiv:1508.02661. Accepted for publication by *Groups, Geometry and Dynamics*.
- *On laminar groups, Tits alternatives, and convergence group actions on S^2* . With Juan Alonso and Hyungryul Baik. arXiv:1411.3532

Awards

- 2015-2017 Math Department Fellowship, UC Davis.
- 2016 Graduate student sectional travel grant, AMS.
- 2015 Alice Leung Award for excellent promise in mathematical research, UC Davis.
- Graduate Studies Travel Award, UC Davis.
 - Math Department Travel Award, UC Davis.
- 2014 Math Department Travel Award, UC Davis.
- 2013 VIGRE Travel Award, Math Department, UC Davis.

Invited talks

- 2018 Redbud Geometry/Topology Conference, Oklahoma State University.
- Special Session on Mathematics of Quantum Computing and Topological Phases of Matter, JMM, San Diego. "Mapping class group actions on representation sets of surfaces and universality in $(2+1)$ -D TQFT."
- 2017 Workshop on computation in geometric topology, University of Warwick.
- Topology Seminar, University of California, Berkeley.
 - Quantum Algebra and Topology Seminar, University of California, Santa Barbara. "Coloring invariants are often intractable."
 - Topology Seminar, University of California, Berkeley. "Computational complexity and 3-manifolds and zombies."
 - Davis Math Conference, University of California, Davis. "Computational complexity in low-dimensional topology."
 - Special Session on Mapping Class Groups and their Subgroups, JMM, Atlanta. "Computational complexity and 3-manifolds and zombies."
- 2016 Special Session on Topological Phases of Matter and Quantum Computation, AMS Eastern Section, Bowdoin College. "A TQC-inspired proof of a classical complexity result for 3-manifolds."
- Quantum Topology Seminar, University of California, Santa Barbara. "A TQC-inspired proof of a classical complexity result for 3-manifolds."
- 2015 Oberseminar Differentialgeometrie, Universität Bonn. "Computational complexity and 3-manifolds and zombies."
- 13th Annual Graduate Student Topology and Geometry Conference, University of Illinois Urbana-Champaign. "Computational complexity and 3-manifolds and zombies."

Professional

- 2016 Participant. 52nd Cornell Topology Festival.
- Participant. Geometry, Topology and Complexity of Manifolds, and applications to Biology (Joelfest), UC Berkeley.
 - Participant. 14th Annual Graduate Student Topology and Geometry Conference, Indiana University Bloomington.
- 2015-2016 Student representative. Graduate Program Committee, UC Davis Math Department.
- 2015 Participant. Introductory School, Hausdorff Research Institute for Mathematics. "Homotopy theory, manifolds, and field theories."
- 2013-2015 Co-organizer w/ G. Mossessian. UC Davis Student-Run Geometry & Topology Seminar.
- 2014 Co-organizer w/ B. Schiffman and D. Weber. Fifth Annual UC Davis Math Conference.
- Participant. 5-Day Workshop, Banff International Research Station. "Quantum Curves and Quantum Knot Invariants."
 - Participant. Albert Schwarz's birthday conference, UC Davis. "The Mathematics of Quantum Theory."
- 2013-2014 Representative. General Assembly, UC Davis Graduate Student Association.

- 2013 Co-organizer w/ K. Schenthal. Fourth Annual UC Davis Math Conference.
- Participant. Séminaire de Mathématiques Supérieures, Centre de Recherches Mathématiques. "Physics and Mathematics of Link Homology."
 - Participant. Hot Topics Workshop, MSRI. "Surface subgroups and cube complexes."

2012-2013 Volunteer. Math Café, UC Davis Women's Research and Resource Center.

Past employment

UC Davis

Associate Instructor.

- 2017 Summer Session I
 - MATH 115A, Number Theory.
- 2015 Summer Session I
 - MATH 115A, Number Theory.
- 2014 Summer Session I
 - MATH 17A, Calculus for Biosciences.

Teaching Assistant.

- 2017 Spring
 - MATH 21A, Calculus, with Professor Eugene Gorskiy.
 - MATH 21C, Calculus, with Professor Naoki Saito. Lead TA.
 - MATH 21C, Calculus, with Professor Motohico Mulase. Lead TA.
- 2017 Winter
 - MATH 17B, Calculus for Biosciences, with Dr. David Cherney.
- 2016 Fall
 - MATH 17A, Calculus for Biosciences, with Dr. Duane Kouba.
- 2015 Fall
 - MATH 21A, Calculus, with Professor Brian Osserman. 1 section and lead TA.
- 2015 Winter
 - MATH 250B, Graduate Algebra, with Professor Dmitry Fuchs.
 - MATH 21A, Calculus, with Dr. Andrew Sornborger.
- 2014 Fall
 - MATH 150A, Modern Algebra, with Professor Kevin Luli. 2 sections.
- 2014 Winter
 - MATH 250B, Graduate Algebra, with Professor Monica Vazirani.
 - MATH 22B, Differential Equations, with Professor Craig Tracy.
- 2013 Fall
 - MATH 250A, Graduate Algebra, with Professor Greg Kuperberg
 - MATH 21A, Calculus, with Dr. Dirk Deckert.
- 2013 Spring
 - MATH 147, Topology, with Professor Greg Kuperberg.
 - MATH 21D, Calculus, with Professor Joseph Biello.
- 2013 Winter
 - MATH 17B, Calculus for Biosciences, with Professor Eric Babson. 2 sections.
- 2013 Fall
 - MATH 21A, Calculus, with Professor Brian Osserman. 2 sections.

Graduate Student Researcher, with Greg Kuperberg.

- 2017 Fall
- 2016 Spring and Summer
- 2015 Spring
- 2014 Spring and Summer
- 2013 Summer

Caltech

Teaching Assistant.

- 2012 Winter
 - Writing Science for the Public, with Professor Leonard Mlodinow.