

General information

- Year of birth: 1982
- Address: Department of Mathematics, University of California, Berkeley, CA 94720, United States of America.
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Research interests

- Topology and geometry in 3 dimensions. I am particularly interested in: algorithms, complexity, knot invariants, normal surface theory, Heegaard splittings, triangulations, unknotting processes, physical knot theory.

Current positions

- July 2013–present. Lecturer, UC Berkeley.
- March 2013–present. Affiliate Associate Professor, Thái Nguyên University, Vietnam.

Previous positions

- July 2012–present. Research Associate, Department of Mathematics and Statistics, University of Sydney, Australia. Position supported by the Australian Research Council through Discovery Grant DP110101104.
- July 2010–June 2012. Krener Assistant Professor, Department of Mathematics, University of California, Davis.
- August 2011–September 2011. Visiting Professor, Thái Nguyên University, Vietnam.
- September 2009–August 2010. Lecturer, University of Oxford.
- July 2008–June 2009. Krener Assistant Professor, Department of Mathematics, University of California, Davis.
- October 2004–June 2008. Lecturer, St Catherine’s College, University of Oxford.

Education

- 2004 - 2008. D.Phil. (Ph.D. equivalent) in Mathematics, University of Oxford. Supervised by Prof. Marc Lackenby. Thesis title: Algorithmically detecting the bridge number of hyperbolic knots.
- 2003 - 2004. Postgraduate Certificate of Education (PGCE) with UK ‘Qualified Teacher Status’, Department of Education, University of Oxford.

- 1999 - 2003. M.Math. (*First Class Honors*) in Mathematics (combined bachelors and masters), University of Oxford.

Awards

- Pending Award Ceremony. Honorary Doctorate in Education, Thái Nguyên University, Vietnam.
- June 2012. Awarded the UC Davis G. Thomas Sallee Mathematics Teaching Award for the best teaching of lower-division mathematics over the previous year.
- June 2012. Nominated for the ASUCD (official student government of UC Davis) 'Educator of the Year' award.
- 2006 - 2008. Senior Germaine Scholar, Brasenose College, University of Oxford.
- 2005 - 2008. Doctoral research funded by an Engineering and Physical Sciences Research Council (EPSRC) Studentship.
- 2000 - 2003. Senior Scholar at St Hugh's College, University of Oxford (prize awarded to the top undergraduate each year across all subjects).
- Twice Represented Oxford University in the COMAP International Applied Mathematics Olympiad. 2001: Honourable Mention; 2002: Meritorious Winner.
- 2000. Winner of the Katherine Lawrence Memorial Prize in Mathematics, St Hugh's College, University of Oxford.

Papers

Papers by me

- Ordering the Reidemeister moves of a classical knot, *Alg. Geom. Top.* 6 (2006) 659-671.
- (Joint with Marc Lackenby) Unknotting genus one knots, *Comment. Math. Helv.* 86 (2011) 383-399.
- (Joint with Benjamin A. Burton and Stephan Tillmann) Computing closed essential surfaces in knot complements, *29th ACM Symp. Comp. Geom., Rio de Janeiro, 2013* (to appear).
- (Joint with Marc Lackenby) An upper bound on Reidemeister moves, *Amer. J. Math.* (to appear).
- (Joint with Joel Hass) Topological and physical link theory are distinct, preprint, *Pacific. J. Math.* (to appear).
- Algorithmically detecting the bridge number of hyperbolic knots, preprint, arxiv.org/abs/0710.1262.
- Crossing changes and circular Heegaard splittings, preprint, arxiv.org/abs/1210.5812.

Papers arising from research projects supervised

- Julian Gold, A bound for orderings of Reidemeister moves, *submitted*.

Selected talks

- *Invited Address* Topology/Geometry Seminar, UC Davis, 6th February 2013, Fast normal surface theory.
- *Invited Address* Algebra/Geometry/Topology Seminar, University of Melbourne, 26th October 2012, Crossing changes and circular Heegaard splittings.
- *Invited Address* Geometry, Topology and Algebra Seminar, University of Sydney, 18th September 2012, Unknotting genus one knots.
- *Invited Address* Geometry, Topology and Algebra Seminar, University of Sydney, 31st July 2012, An upper bound on Reidemeister moves.
- *Invited Address* Topology Seminar, University of California at Santa Barbara, 29th May 2012, Topological and physical link theory are distinct.
- *Invited Conference Address* The 46th Spring Topology and Dynamics Conference, Mexico City, 22nd March 2012, Topological and physical link theory are distinct.
- *Invited Conference Address* Redbud Topology Conference, Oklahoma State University, 3rd March 2012, Topological and physical link theory are distinct.
- *Invited Address* Topology Seminar, UC Riverside, 14th February 2012, Unknotting crossing changes and circular Heegaard splittings.
- *Invited Address* Topology Sominar, University of Texas at Austin, 31st October 2011, Crossing changes and circular Heegaard splittings.
- *Invited Conference Address* 2011 AMS Spring Central Section Meeting, Special Session on Thin Position, 19th March 2011, Crossing changes and circular thin position.
- *Invited Conference Address* 54th annual meeting of the Australian Mathematical Society, Special session on Topology and Geometry, Brisbane, Australia, 27th September 2010, An upper bound on Reidemeister moves.
- *Invited Address* Differential Geometry Seminar, University of Cambridge, 19th May 2010, An upper bound on Reidemeister moves.
- *Invited Address* Topology Seminar, Durham University, 19th May 2010, An upper bound on Reidemeister moves.
- *Invited Address* Geometry and Topology Seminar, University of Warwick, 28th January 2010, 19th May 2010, An upper bound on Reidemeister moves.
- *Invited Conference Address* Computational and Algorithmic Geometry, William Rowan Hamilton Geometry and Topology Workshop, September 2009, An upper bound on Reidemeister moves.

- *Invited Conference Address* Geometric Topology in 3 and 4 Dimensions, Conference in honour of Martin Scharlemann, UC Davis, 25th June 2009, An upper bound on Reidemeister moves.
- *Invited Address* Topology Seminar, University of California at Berkeley, 1st April 2009, Unknotting genus one knots.
- *Invited Address* Topology/Geometry Seminar, University of California at Davis, 3rd February 2009, Unknotting genus one knots.
- *Invited Address* Topology Seminar, University of California at Santa Barbara, 29th January 2009, Unknotting genus one knots.
- *Invited Conference Address* Joint Mathematics Meetings, AMS Special Session on Teichmüller Theory and Low-Dimensional Topology, Washington DC, 6th January 2009, Unknotting genus one knots.
- *Invited Address* Topology/Geometry Seminar, University of California at Davis, 21st October 2008, Detecting the bridge number of hyperbolic knots.
- *Contributed Talk* Meeting of London Mathematical Society, 4th July 2008, Algorithms and hyperbolic 3-manifolds.
- *Invited Conference Address* The 25th Annual Workshop in Geometric Topology, Park City, Utah, 27th June 2008, Detecting the bridge number of hyperbolic knots.
- *Invited Conference Address* Warwick symposium, Workshop on 3-manifold geometry and topology, 11th July 2007, Detecting the bridge number of hyperbolic knots.
- *Invited Address* Topology Seminar, Oxford University, 30th April 2007, Detecting the bridge number of hyperbolic knots.

Service

- Referee of many papers for journals such as Journal of Topology, Geometry and Topology, Pacific Journal of Mathematics, Topology and its Applications, Algebraic and Geometric Topology and Geometriae Dedicata.
- Fall 2011. Organizer of the Topology and Geometry Seminar, UC Davis.
- Summer 2011. Supervised an NSF funded undergraduate REU, UC Davis.
- Fall 2008. Designed and delivered new graduate course ‘Knots and surfaces in 3-manifolds’, UC Davis, Fall 2008.
- Winter 2009. Organized advanced class on the Gordon Conjecture, UC Davis.
- Summer 2011. Faculty instructor, UC Davis COSMOS program.
- Summer 2010. Faculty instructor, UC Davis COSMOS program.
- Summer 2009. Teacher fellow, UC Davis COSMOS program.

Teaching

University of California at Davis

- Taught the following undergraduate classes:
 - Fall 2008. 16A - Short calculus.
 - Winter 2009. 22B - Differential equations.
 - Spring 2009. 16C - Short calculus.
 - Fall 2010. 22B - Differential equations.
 - Spring 2011. 16B - Short calculus.
 - Spring 2011. 147 - Topology.
 - Fall 2011. 21D - Vector calculus.
 - Spring 2012. 21C - Calculus.
- June 2012. Awarded the UC Davis G. Thomas Sallee Mathematics Teaching Award for the best teaching of lower-division mathematics over the previous year.
- June 2012. Nominated for the ASUCD (official student government of UC Davis) 'Educator of the Year' award.
- Fall 2008. Designed and taught graduate course 'Knots and Surfaces in 3-manifolds'.
- Spring 2008. Organized and taught advanced class on the Scharlemann-Qui proof of the Gordon conjecture.

University of Oxford

- Spring 2006. Class tutor for the fourth year course 'Analytic Topology'.
- Fall 2009. Lecturer and class tutor for the fourth year course 'Topology and Groups'.
- Fall 2009. Class tutor for the fourth year course 'Graph Theory'.
- Summer 2010. Wrote and examined Section C finals paper 'C3.1a Topology and Groups'.

Thái Nguyên University, Vietnam

- Since 2011. Extensive service to Thái Nguyên University in Vietnam, in undergraduate instruction, curriculum development, teacher training and outreach.

St. Catherine's College, University of Oxford

- 2004 -2008. College lecturer and tutor of mathematics at St Catherine's College. Taught all areas of undergraduate pure mathematics in tutorials and classes, organized and graded examinations and interviewed applicants.