

THOMAS KINDRED

University of Nebraska-Lincoln
Department of Mathematics
203 Avery Hall
Lincoln, NE 68588-0130

(614) 314-7976
thomas.kindred@unl.edu
www.thomaskindred.com

PROFESSIONAL EXPERIENCE

University of Nebraska-Lincoln Postdoctoral Faculty Fellow August 2018-Present

EDUCATION

University of Iowa, Iowa City, IA Ph.D. May 2018
Major: Mathematics: geometric topology M.S. December 2014
Advisor: Dr. Charlie Frohman

Williams College, Williamstown, MA B.A. June 2007
Major: Mathematics Highest Honors
Advisor: Dr. Colin Adams

RESEARCH INTERESTS

Classical knot theory, especially spanning surfaces; multisections of n -manifolds, especially trisections of 4- and 5-manifolds; knotted surfaces in four dimensions; quantum topology

Postdoctoral advisors: Dr. Mark Brittenham and Dr. Alex Zupan

PUBLICATIONS AND PREPRINTS

- ☐ *Obstructing boundary destabilizations of relative trisections* (with Nick Castro), in preparation
 - ☐ *The essence of a spanning surface*, in preparation, [slides](#)
 - ☐ *Smooth multisections of odd-dimensional tori and other manifolds*, submitted to Alg. Geom. Topology, [pdf](#)
 - ☐ *A geometric proof of the flyping theorem*, submitted to Advances in Mathematics, [pdf](#) [slides](#) [video](#)
 - ☐ *Nonorientable spanning surfaces for knots*, to appear in the Concise Encyclopedia of Knot Theory
 - ☐ *Crosscap numbers of alternating knots via unknotting splices*, Internat. J. Math. 31 (2020), no. 7, 2050057, 30 pp. [pdf](#) [video](#)
 - ☐ *Alternating links have representativity 2*. Alg. Geom. Topology 18 (2018), no. 6, 3339-3362. [pdf](#)
 - ☐ *Plumbing essential states in Khovanov homology*, New York J. Math. 24 (2018), 588-610. [pdf](#)
 - ☐ *Heegaard diagrams corresponding to Turaev surfaces* (with Cody Armond and Nathan Druivenga), J. Knot Theory Ramifications 24 (2015), no. 4, 1550026, 14 pp. [pdf](#)
 - ☐ *A classification of spanning surfaces for alternating links* (with Colin Adams), Alg. Geom. Topology 13 (2013), no. 5, 2967-3007. [pdf](#)
-

TEACHING EXPERIENCE

- Postdoctoral Faculty Fellow**, University of Nebraska-Lincoln August 2018-Present
Lincoln, NE
- Linear Algebra (F18, F19, F20)
 - Discrete & Finite Math: graphs & combinatorics, proofs; inquiry-based (F20)
 - Topology II: fundamental groups, covering spaces, homology; qual course (S20)
 - Introduction to Modern Algebra: a “rings first” proofs course (S19, F19)
- Instructor, Teaching Assistant, and Tutor**, University of Iowa Fall 2012-May 2018
Iowa City, IA
- Topics in Topology: substitute professor for six weeks post-defense (S18)
 - Engineering Math 2: vector calculus with Mathematica (F13, S14, S15, S18)
 - Calculus 2 (F17)
 - Elementary Functions: precalculus with trig (S17, instructor of record)
 - College Algebra (F16, instructor of record)
 - Grad topology: general topology, homotopy theory, smooth manifolds (F15-S16)
 - Summer prep course for qualifying exam in topology (2015, 2016)
 - Engineering Math 1: single-variable calculus (F14)
 - Introduction to Undergraduate Research (S13)
 - Mathematics for the Biological Sciences (F12)
 - Math Tutorial Lab: college algebra through linear algebra (F12-S18)
- Math and Physics Teacher**, Potts Camp High School August 2009-May 2012
Potts Camp, MS
- Taught geometry, algebra 2, and trigonometry/precalculus each year
 - Also taught calculus first year, physics second year, and both third year
 - Volunteered as assistant baseball coach each spring
 - Certified through the Mississippi Teacher Corps
- Math Teacher**, The Charles School November 2008-May 2009
Columbus, OH
- Taught remedial pre-algebra and fundamentals of math to 9th-graders
- Teaching Assistant and Grader**, Williams College September 2004-May 2007
Williamstown, MA
- Graded homework and held office hours for discrete math and real analysis

SELECTED HONORS & AWARDS

MAA Project NExT Fellow	2019
Parents' Recognition Award for Contribution to Students	2019
University of Iowa Thank-A-Teacher letter recipient	2016
Catherine Wegner Outstanding Teaching Assistant Award Winner	2015

INVITED TALKS

<i>Symmetries of alternating link exteriors, spatial graphs, and branched surfaces</i> Joint math meetings	Virtual January 2021
<i>The geometric content of Tait's conjectures</i> Ohio State CKVK* seminar	Virtual November 2020
<i>Spanning surfaces: essence, plumbing, and flypes</i> University of Virginia Geometry Seminar	Virtual October 2020
<i>A geometric proof of the flyping theorem</i> Oklahoma State Topology Seminar	Virtual September 2020
<i>Symmetric, efficient multisections of odd-dimensional tori</i> Virtual Trisectors Seminar	Virtual August 2020
<i>Splice-unknotting and crosscap numbers</i> Nearly Carbon Neutral Geometry and Topology Conference	Virtual June 2020
<i>Efficient multisections of odd-dimensional tori</i> University of Iowa Topology Seminar	Virtual April 2020
<i>Checkerboards & crosscaps</i> University of Nebraska-Lincoln Seminar on Groups, Semigroups, & Topology	Lincoln, NE March 2018
<i>Checkerboards & crosscaps</i> Boston College Geometry-Topology Seminar	Boston, MA March 2018
<i>Checkerboard plumbings</i> Williams College Faculty Seminar	Williamstown, MA October 2017
<i>Plumbings of checkerboards</i> AMS Sectional Meetings	Buffalo, NY September 2017
<i>Plumbing is a natural operation</i> GEAR Junior Retreat	Stanford, CA August 2017
<i>Alternating links have representativity 2</i> AMS Sectional Meetings	New York, NY May 2017
<i>Plumbing in Khovanov homology</i> AMS Sectional Meetings	Minneapolis, MN October 2016
<i>Khovanov homology detects adequate homogeneous states</i> MAA Mathfest	Columbus, OH August 2016
<i>What is an alternating link?</i> Advances in Quantum Topology	Iowa City, IA April 2016

SELECTED SEMINAR TALKS AT THE UNIVERSITY OF NEBRASKA-LINCOLN

<i>Essence of a spanning surface</i>	GST seminar	October 2020
<i>A geometric proof of the flyping theorem</i>	GST seminar	October 2020
<i>Orderability, surgery, and double-branched covers</i>	GST seminar	October 2019
<i>Orderability of knot groups of fibered knots</i>	GST seminar	October 2019

<i>Heegaard-Kirby diagrams</i>	4-manifolds reading seminar	October 2019
<i>Heegaard splittings and trisections</i>	4-manifolds reading seminar	September 2019
<i>Diagrams of knotted surfaces in 4-space</i>	4-manifolds reading seminar	June 2019
<i>Crosscap numbers of alternating knots via unknotting splices</i>	GST seminar	April 2019
<i>Plumbings of 4-manifolds (2-part talk)</i>	4-manifolds reading seminar	March 2019
<i>Carving, framing, and canceling</i>	4-manifolds reading seminar	January 2019
<i>Essential slopes of a knot (2-part talk)</i>	GST seminar	September 2018

SELECTED SEMINAR TALKS AT THE UNIVERSITY OF IOWA

<i>Checkerboard plumbings</i>	Three minute thesis competition	October 2017
<i>Checkerboard plumbings</i>	GAUSS	October 2017
<i>Quadratic differentials & measured foliations</i>	Topology reading seminar	March 2017
<i>The metric on Teichmuller space</i>	Topology reading seminar	March 2017
<i>Alternating links have representativity 2</i>	Topology seminar	February 2017
<i>Inscribed rectangles & rhombi via Mobius bands</i>	GAUSS	February 2017
<i>Introduction to Teichmuller space</i>	Topology reading seminar	January 2017
<i>Why study hyperbolic geometry?</i>	Student topology seminar	November 2016
<i>Thin triangles imply exponential explosion.</i>	Student topology seminar	November 2016
<i>Surface bundles & the Meyer signature cocycle</i>	Topology reading seminar	October 2016
<i>Plumbing in Khovanov homology</i>	Graduate student seminar	September 2016
<i>Origins and rudiments of hyperbolic geometry</i>	Student topology seminar	September 2016
<i>Geometric structures via gluing of Platonic solids</i>	Topology reading seminar	April 2016
<i>Geometry and topology of 3-manifolds</i>	Topology reading seminar	January 2016
<i>Rational surgery coefficients & the slam dunk move</i>	Topology reading seminar	December 2015
<i>Examples of Dehn surgery on knots</i>	Topology reading seminar	November 2015
<i>Classification of torus bundles and semi-bundles</i>	Topology reading seminar	October 2015
<i>Prime decompositions of 3-manifolds</i>	Topology reading seminar	September 2015
<i>Geometry of alternating links</i>	Topology seminar	March 2015
<i>Invitation to Spivak's <u>Calculus on Manifolds</u>.</i>	Student topology seminar	January 2015
<i>State surfaces in Khovanov homology</i>	Topology seminar	October 2014
<i>The Temperley-Lieb algebra & Jones polynomials</i>	Student topology seminar	April 2014
<i>Geometric & algebraic caps for spanning surfaces</i>	Topology seminar	March 2014
<i>Gromov hyperbolicity</i>	Topology reading seminar	October 2013
<i>Introduction to spanning surfaces</i>	Student topology seminar	September 2012

SERVICE

- **Referee or reviewer** for Alg. Geom. Topology, Illinois Math. J., Internat. J. Math., J. Knot Theory Ramifications, New York J. Math., Osaka J. Math.
- **Putnam exam co-coordinator** (F18, F19, present)
- **Great Plains Alliance co-coordinator**, arranging regional talks by UNL grad students (F18-present)
- **Evaluator** of UNL undergraduate research proposals (S19, S20)
- **Organizer** or co-chair for the following seminars:
 - Nebraska GST seminar: Groups, Semigroups and Topology (F19)
 - Nebraska 4-manifold reading seminar (F19)
 - Iowa GAUSS: Graduate And Undergraduate Student Seminar (S17-S18)
 - Iowa student topology seminar (S15, F16)
 - Iowa topology reading seminar (F15-S16)
- **Mentor** for younger students and the surrounding community:
 - Volunteered for Math Day at Lucas Elementary School (2017, 2018)
 - Volunteered for Sonia Kovalevsky Day, to encourage high school girls interested in math (2016)
 - Welcomed incoming graduate students in the University of Iowa's Buddy Program (2014-2016)
 - Served as a Williams College Junior Advisor (F05-S06)
- **Advocate** for students, teachers, and colleagues:
 - Alternate math delegate to the University of Iowa Graduate Student Senate (2016-2018)
 - Member of the University of Iowa Affordable Housing Task Force (2016)
 - Williams College Olmsted Prize Committee to recognize excellent high school teaching (S06)
 - Student representative on the Williams College Committee on Priorities and Resources (S05-F06)

References available upon request