Sierra A Knavel

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CONTACT INFORMATION	Mathematics Departmentsknavel3@gatech.eduGeorgia Institute of TechnologyAtlanta, Georgia, 30318Skiles Classroom Building, Office 252Skiles Classroom Building, Office 252
RESEARCH INTERESTS	Low-dimensional topology, contact geometry, Lagrangian cobordisms, Legendrian curvature Symplectic structures on 4-manifolds, Lefschetz fibrations and pencils, symplectic divisors
EDUCATION	Georgia Institute of TechnologyPh.D. Candidate, expected date of completion: May 2026Advisor: John EtnyreRTG Fellowship (Aug 2020-Aug 2023)2024-2025 O'Hara FellowPresident's Fellowship (Aug 2020 - Current)Goizueta Fellowship (Aug 2022 - Current)Pathbreakers Fellowship (previously UCEM-PhD Fellowship) (Aug 2023 - Current)Ohio UniversityB.S. Mathematics, Honors Tutorial College (May 2020)John Newton Templeton Scholar, Summa Cum LaudeEdwin L. Kennedy Leadership Award for Outstanding Community Service
PUBLICATIONS	 Alternate proofs of Matsumoto's construction of Lefschetz fibrations. S. Knavel. in preparation. 2025 New bounds on Betti numbers of Lefschetz fibrations. S. Knavel, in preparation. 2025 Symplectic divisors in Lefschetz fibrations. S. Knavel, R. Van Why. in preparation. 2025 Invertible Lagrangian cobordisms of Legendrian knots. S. Knavel, T. Rodewald. in preparation. 2025 Legendrian knots in the 3-sphere with small curvature. S. Eli, S. Knavel, T. Rodewald. in preparation. 2025 Embedded totally geodesic surfaces in fully augmented links. S. Knavel, R Trapp. Communications in Analysis and Geometry Volume 23, Number 4, 797-826, 2021 Inspiring Mathematics: Lessons from the Navajo Nation Math Circles. R. Bycofski, B. Klein, and S Knavel. (2020, Release Jan 2.). The Pancake Problem. In, D. Auckly, B. Klein, A. Serenevy, and T. Shubin (Eds.) Jointly published by the American Mathematical Society (AMS) and the Mathematical Sciences Research Institute (MSRI) as Volume 24 of the Math Circles Library. https://bookstore.ams.org/mcl-24/ A Mathematical Model of Solid-State Dewetting of Barium Thin Films on W(112). S. A. Knavel, T. V. Savin, M. V. Mroz, M. E. Kordesch, C. N. Eads, J. T. Sadowski, and S. A. Tenney. Mathematical Modelling of Natural Phenomena. EDP Sciences, 2019.

INVITED TALKS	★ Future: Title TBD,
	May 2025, Women and Gender Minorities in Symplectic and Contact Geometry and
	Topology (WISCons) at AWM Symposium, Madison WI
	★ Future: Title TBD
	May 2025, Spring Western AMS Sectional, California Polytechnic State University, San
	Luis Obispo CA
	★ "Betti Numbers and Indecomposability of Genus-2 Lefschetz fibrations,"
	Apr 2025, The Claremont Colleges Topology Seminar, Claremont Center for
	Mathematical Sciences, Claremont CA
	★ "Genus-2 Lefschetz fibrations,"
	Mar 2025, Spring Southeastern AMS Sectional, Clemson SC
	★ "Genus-2 Lefschetz fibrations,"
	Oct 2024, Vanderbilt Topology Seminar, Nashville TN
	★ Cancelled : "Lefschetz fibrations with Abelian fundamental groups,"
	Oct 2024, Fall Southeastern AMS Sectional, Georgia Southern University, Savannah GA
	★ "Lefschetz fibrations with Abelian fundamental groups,"
	Mar 2024, Spring Southeastern AMS Sectional, Florida State University, Tallahassee FL
	★ "Lefschetz fibrations with fixed finitely presented fundamental groups,"
	Jan 2024, JMM , San Francisco CA
	★ "Fundamental Groups of genus-2 Lefschetz fibrations,"
	Dec 2023, Tech Topology Winter School, Atlanta GA
	★ "A Lefschetz fibration construction with arbitrary finitely presented fundamental group,"
	July 2023, Lightning talk at Tech Topology Summer School , Georgia Tech
AWARDS AND	Outstanding Student Evaluations Georgia Tech School of Mathematics
HONORS	Academic year 2021-2022 Awarded to Graduate Student TAs in the SoM
	Thank-a-Teacher Program Center for Teaching and Learning, GATech
	Fall 2021, Spring 2022
	Phi Beta Kappa
	May 2020
	Edwin L. Kennedy Leadership Award for Outstanding Community Service, Ohio U
	May 2020
PROFESSIONAL	Organizer, Directed Reading Program GT School of Mathematics
SERVICE &	Co-organizer, 2023-2024, 2024-2025, 2025-2026
MATH	Conference Organization
OUTREACH	WISCons at AWM Biannual Symposium in Madison, WI, co-organizer
	WISCons at JMM in Washington, DC, co-organizer
	Problem Session Leader
	PUMA: Practicum for Undergraduate MAthematicians in Topology at IPAM: Institute for
	Pure and Applied Mathematics, UCLA, Apr 2025
	GT Student Topology Seminar
	Co-organizer, 2023-2025
	Councilmember, Graduate Student Council GT School of Mathematics
	2022-2024

	Organizations
	AWM Chapter at Georgia Tech, Secretary 2023-2024
	AMS Chapter at Georgia Tech, Member
	Volunteering
	High School Math Competition, GT, April 2023
	Studypalooza, Office of Tutoring & Academic Support, Fall 2022, Spring 2023
	Allegiance of Indigenous Math Circles Math Camp Dine Preparatory School
	Farmington, New México Summer 2017
	Peer mentor to over 30 students from Navajo (Dine), Apache, or Hopi tribe and assistant to Dr. Robert Klein
INTERNAL	★ "Two-fold branched covers of hyperelliptic Lefschetz fibrations,"
TALKS	Feb 2024, Georgia Tech Student Topology Seminar
	★ "Genus-2 Lefschetz fibration,"
	Oct 2023, Georgia Tech Student Topology Seminar
	★ "An introduction to 4-manifolds,"
	Sep 2023, Georgia Tech Student Topology Seminar
	★ "An exotic contractible 4-manifold,"
	Sep 2022, Georgia Tech Student Topology Seminar
	★ "Constructing Exotic 4-manifolds via cork twists, Gluck twists, and log transforms,"
	Dec 2021, Georgia Tech Student Topology Seminar
TEACHING	Teaching Assistantships
EXPERIENCES	Head TA, Linear Algebra (Spring 2025)
	Linear Algebra (Fall 2023)
	Multivariable Calculus (Fall 2021, Spring 2022, Summer 2022)
	Substitute Instructor
	Multivariate Calculus, 2 Lectures, Fall 2021
	Multivariate Calculus, 2 Lectures, Spring 2023
	Pre-Calculus, 5 Lectures, Summer 2023
	Directed Reading Program
	The DRP at Georgia Tech pairs undergraduate students with graduate students to undertake
	independent study projects or explore advanced topics in mathematics.
	(Spring 2025) Math Visualization and Knot Theory
	Nathaniel Wicker and Yao Xiao
	(Fall 2023) Introduction to Riemann Surfaces
	With Arya Karthik
	(Fall 2022) Introduction to Topology and Algebraic Topology
	with Maya Mims
	(Spring 2022) Chaos Theory
	with Mark Rodriguez & Matthew Walloch
	(Fall 2021) Math and Physics Simulations in Python
	with Cara Bennett
	(Spring 2021) Introduction to Knot Theory
	with Ethan Botelho

	(Fall 2020) Self-Similar Fractals, Hausdorff Dimension & Geometry
	with Avery Williams
	Assistant to the Director of Teaching Assistants
	Observing and training all incoming undergraduate Teaching Assistants for Fall 2023
	under Klara Grodzinsky
PROFESSIONAL	Fall 2022 GTx MGT1000 MOOC
DEVELOPMENT	Innovation Leadership
	Certification completion
	Summer 2021 CornellX CIRTL Network MOOC
	An Introduction to Evidence-Based Undergraduate STEM Teaching
	Certification completion with distinction
OTHER	Upcoming: (International) Georgia Topology Conference at University of Georgia
CONFERENCE	May 19-30, 2025 Athens, Georgia, US
ATTENDANCES	IPAM PUMA at IPAM UCLA
	Apr 12-13, 2025 Los Angeles, California, US
	Joint Mathematics Meeting (JMM)
	Jan, 2025 Seattle, Washington, US
	Moab Topology Conference at Utah State University Moab
	May 1-3, 2023 Moab, Utah, US
	BIRS Workshop, Interactions between Symplectic and Holomorphic Convexity in 4-dimensions
	at Banff Centre for Arts and Creativity
	April 9-14, 2023 Banff, Alberta, Canada
	Singularities and Low Dimensional Topology Winter School at Renyi Institute
	January 20-27, 2023 Budapest, Hungary
	Tech Topology Conference at Georgia Tech
	December 9-11, 2022 Atlanta, Georgia, US
	Frontiers in Geometry and Topology Summer School
	The Abdus Salam International Centre for Theoretical Physics
	August 1-5, 2022 Trieste, Italy
	Graduate Student Topology and Geometry Conference (GSTGC) at Georgia Tech
	Co-organizer
	April 1-3, 2022 Atlanta, Georgia, US
	Tech Topology Summer School at Georgia Tech
	July 26-30, 2021 Atlanta, Georgia, US
	Mathematics Teacher-Scholar Symposium (MaTSS) at Reed College
	May 22-23, 2021 Portland, Oregon, US
UNDER-	California State University San Bernardino REU
GRADUATE	Summer 2019 Funded by NSF Grant 175 8020 Advised by Rollie Trapp
RESEARCH	Paper: Totally embedded geodesic surfaces in fully augmented link complements.
	Valparaiso University REU (VERUM)
	Summer 2018 Funded by NSF Grant DMS-155 9912 Advised by Jon Begley
	Paper: On copoint graphs of convex geometries.