Trevor K. Karn

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Interests   Combinatorics, applied topology and geometry

Education   **University of Minnesota**, Minneapolis, Minnesota USA
   Ph.D. student in Mathematics

   Advisor: Vic Reiner

U.S. Naval Academy, Annapolis, Maryland USA
   BS with Distinction in Mathematics (Honors)

   Thesis: *Matroid Kazhdan-Lusztig polynomials and Structures of Flags*
   Advisor: Max D. Wakefield

Publications   In reverse chronology

   2. Modeling of a Hidden Dynamical System Using Energy Minimization and Kernel
      Density Estimates (with S. Petrone and C. Griffin), *Physical Review E* Volume
      100, October 2019.

   1. Stirling Numbers in braid matroid Kazhdan-Lusztig polynomials (with M. Wake-
      field), *Advances in Applied Mathematics* Volume 103, February 2019.

Experience   In reverse chronology

   5. SageMath, Google Summer of Code 2021, *G-invariants of Orlik-Solomon and
      Orlik-Terao algebras*

   4. Pennsylvania State University Applied Research Laboratory, Communication,
      Navigation, and Information Office, Research Assistant, 2019-2021

   3. National Security Agency, selected to interview for Graduate Mathematics Pro-
      gram (cancelled due to COVID-19), 2020

   2. Pennsylvania State University Applied Research Laboratory, Communications,
      Navigation, and Information Office, Research and Development Engineer, 2018-
      2019

   1. Johns Hopkins University Applied Physics Laboratory *National Security Analysis
      Department*, Internship, 2017

Awards   **Team Winner,** Applied Research Laboratory Award for Engineering Excellence, 2021
Professor Henry M. Robert, Jr. Prize, Department of Mathematics, U.S. Naval
Academy, 2018
1st Place Student Paper, Undergraduate Research Conference Awards, MAA Maryland-
District of Columbia-Virginia, 2017, Awarded for talk [2]
Team Winner, Syn Bio Academies Challenge, Defense Threat Reduction Agency, 2016

SUMMER SCHOOLS   Awarded funding for Algebraic Combinatorics in Kraków 2020, Krakow, Poland, canceled due to COVID-19

Institute for Advanced Study, Park City Math Institute Undergraduate Summer School 2017, Park City, Utah USA

SELECTED TALKS   In reverse chronology

8. *Equivariant Kazhdan-Lusztig polynomials and their combinatorics*, University of Minnesota Student Representation Theory Seminar, July 2021

7. *Introduction to SageMath*, University of Minnesota Student Combinatorics Seminar, February 2021

6. *Stirling Numbers in braid matroid Kazhdan-Lusztig polynomials*, Graduate Online Combinatorics Colloquium, May 2020

5. *Stirling Numbers in braid matroid Kazhdan-Lusztig polynomials*, Joint Mathematics Meetings, MAA General Session on Other Topics, January 2019

4. *Persistent Homology for Data Scientists*, Pennsylvania State University Applied Research Laboratory Idea Share, December 2018

3. *Stirling numbers of the first kind in braid matroid Kazhdan-Lusztig polynomials*, USNA CAT (Combinatorics, Algebra, and Topology) seminar, March 2018

2. *The flag counting problem for partition lattices*, MAA MD-DC-VA Section Meeting, April, 2017.

1. *Editing the human microbiome: proactively preventing aerosolized conotoxins*, Office of the Assistant Undersecretary of Defense for Research and Engineering, the Pentagon, Washington, D.C., USA, September 2016.

TEACHING

University of Minnesota Teaching Assistant

MATH 1272 Calculus II	**Spring 2020**
	Fall 2021
Research Experience for Undergraduates	**Summer 2021**
MATH 2243 Linear Algebra and Differential Equations	**Spring 2021**
	Fall 2020
MATH 1271 Calculus I	**Fall 2019**

Summer Heros Youth Program Annapolis, Maryland, USA

Math Coordinator	**Summer 2016**

U.S. Naval Academy Midshipman Group Study Leader

Fundamentals of Mathematics	**Spring 2017, 2018**
Probability and Statistics I	**Fall 2016, 2017**
Calculus II	**Fall 2015**

PROFESSIONAL SERVICE	• Session Chair and Recorder, Grad. Student Combinatorics Conference **April 2021**
	• Organizer, UMN Student Combinatorics and Algebra Seminar **2020-2021**
	• Organizer, UMN Combinatorics Working Groups workshop **Spring 2020**
	• Member, UMN Directed Reading Program organizing committee **2019-2020**

STUDENTS MENTORED	• Elise Catania (University of Minnesota Graduate Student) **2021-2022**
	Graduate Student Peer Mentor
	• Angel Chavez (University of Minnesota Graduate Student) **2021-2022**
	Graduate Student Peer Mentor
	• Ethan Partida (University of Minnesota Undergraduate Student) **2020-2021**
	Directed Reading Program in applied category theory, independent readings in combinatorial commutative algebra and computational topology
	• LTJG Meghan McDonough (Naval Postgrad. Sch. M.S. Student) **2019-2020**
	Tutoring in data science and applied mathematics coursework

SOFTWARE CONTRIBUTIONS	• Enhancements to representation theory of $\mathfrak{S}_n$ in SageMath
	• Implementation of invariant submodules in SageMath