

Steppan Konoplev

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EDUCATION

2022-Present Math PhD at University of Delaware (UD)

- Advised by Mokshay Madiman
- Completed all requirements except thesis, working on research to begin thesis

2022-2023 Masters of Science in Mathematics at UD

- Finished in 1st year of PhD by acing qualifying exams and satisfying credits requirement

2019-2022 University of Maryland College Park (UMD) math major

- B.S. in Mathematics with High Honors, also CS minor
- Science, Discovery, and the Universe Scholars Program

PUBLICATIONS AND PREPRINTS

- Konoplev, S., Medel, J., & Russell, V. (2025). Non-Kähler C-Y 3-Folds Arising from Singular K3 Surfaces. *Note Di Matematica*, 45(2).
- Konoplev, S., Medel, J., & Russell, V. (2022). Cohomology of K3 surfaces. Technical report for AMRPU 2022
- Konoplev, S. (2019). On Alphonse's Conjecture about Hamiltonian Paths in Hypercubes. arXiv. Retrieved from <https://arxiv.org/abs/2002.02285>
- Konoplev, S. (2019). Convergence of General Alternating Series. *CHS Math Journal*, 30–32.
 - drive.google.com/file/d/1dsfzjEEndlhoFnpD2aDSLmhU5w9qisb

PRESENTATIONS

- Talk Series, Operator Algebras Seminar, UD, November – December 2023, *Classification of von Neumann Algebras* (and prerequisite results)
- Talk, HGSS, UD, 20 September 2023, *Sieriation of Samples of Graphons*
- Talk, GTA Philadelphia Conference, Temple University, 28 May 2023, *Calculating Cohomology of singular K3 surfaces*
- Invited Talk, Graduate Student Intercollegiate Mathematics Seminar, Lehigh University, 25 April 2023, *Probabilistic Method for solving Discrete Math Problems*
- Poster, UD Winter Research Symposium, University of Delaware, 3 March 2023, *Cohomology of Singular K3 surfaces*
- Talk, HGSS, UD, 20 February 2023, *Induction on the Real Numbers*
- Talk, HGSS, UD, 19 October 2022, *Probabilistic Method*

ACADEMIC COMPETITIONS AND AWARDS

- 7th in 2024 Intercollegiate Programming Competition Mid-Atlantic Site Regionals
- 1st place in 2023, 2024, 2025 George Mason University Calculus Olympiad
- UD 2023 Winter Research Symposium Winning Poster
- 1st place in 2022 New Jersey Undergraduate Math Competition
- UMD comprehensive math honors exam all time high score
- 2021 IMC (International Math Competition) first prize, highest ranked U.S. student, 32nd/589
- Top 50 in 2020 Putnam Math Competition (based on score of 68/120 and 39 for top 100)
- 2020 IMC first prize
- 1st place in 2019 Virginia Tech Regional Mathematics Competition
- Top 200 in 2019, 2021 Putnam Math Competition

- Lockheed Martin Challenge Box: Won Voyager Golden Record replica for solving challenging computer science problems

RESEARCH AND PROJECTS

May 2024-ongoing Candidacy, Research, and Thesis with Mokshay Madiman

- Directions and project ideas planned for research work, thesis topic TBD
- Candidacy exam passed in December 2024
 - Covered *The Expected L_p Norm of Random Polynomials*, Borwein-Lockhart

January 2023-September 2023 Graph Limits with Mahya Ghandehari

- Read chapters 7-11 of Lovasz's textbook *Large Networks and Graph Limits* in spring 2023 and presented proofs of multiple major results in informal graphons seminar
- Collaborated with Mahya and Jeannette Janssen to generalize *A Spectral Algorithm for Seriation* (1998) to graphons
 - Routine parts of generalization published by collaborators
 - Original contributions to be gathered and appear in a solo paper in 2025

February 2023-April 2023 Projective geometry with Robert Coulter

- Worked on open problem: projective plane having linear planar ternary ring implies transitive elation or transitive homology group
- Positive answer implies significant simplification of Lenz-Barlotti classification
- Disproved claim by prominent projective geometers that Pickert's book *Projektive Ebenen* implies a proof, explained why problem still open and out of reach of coordinatization methods

May 2022-July 2022 Florida International University REU

- Researched complex algebraic geometry with Gueo Grantcharov and Anna Fino
- Completed commutative algebra worksheets, learned basic material on K3 surfaces, and read papers on weighted projective space
- Extended Iano-Fletcher's paper *Working with Weighted Complete Intersections* by calculating the cohomology of all K3 surfaces with A_n -type singularities

TEACHING AND RELATED JOBS

Aug 2022-December 2024 UD Math TA

- Run discussion section, hold office hours every week, grade quizzes & exams
- Classes taught: finite mathematics (MATH 230), all levels of Calculus (MATH 241, 242, 243)

Aug 2021-May 2022 Gossett Student Athletic Center Tutor

- Tutored student athletes in upper-level undergraduate math courses including linear algebra and introduction to real analysis

Nov 2020-Feb 2022 Office of Multi-ethnic Student Education Tutor

- Tutored OMSE students in any 100 or 200 level math or computer science course
- Managed GroupMe group for efficient sharing of information during tutoring sessions

Aug 2021-Dec 2021 UMD MATH 410 grader

- Graded assignments for a real analysis class and gave feedback on proof writing

Jan 2021-May 2021 UMD MATH 310 grader

- Graded assignments in an introduction to proofs class and gave feedback on proof writing

OTHER PROFESSIONAL ACTIVITIES

- Quora math writer (2017-2021): Volunteered hundreds of hours of time to answer math questions on Quora, with 263 answers and 570k views (including content collapsed by bots)
 - <https://www.quora.com/profile/Steppan-Konoplev-1>

- Student organizer at UD (2022-): President and founder of card games club, social events organizer for competitive programming club, Quizbowl club tournament director, recruited dozens of players to Hen Zone table tennis
- Competitive table tennis and pickleball player at UD
 - Awards include 1st in Spring 2025 UD men's pickleball intramurals, 2nd in 2024 UD mixed pickleball intramurals, 2024 UD table tennis intramural champion