

ANNA PARLAK

Krener Assistant Professor
University of California, Davis

✉ abparlak@ucdavis.edu
🔗 <https://annaparlak.github.io>

EMPLOYMENT

University of California Davis, United States *July 2022 - now*
Krener Assistant Professor

University of Oxford, United Kingdom *May 2021 - July 2022*
Postdoctoral Research Associate in Pure Mathematics

EDUCATION

University of Warwick, United Kingdom *October 2017 - August 2021*
Mathematics, PhD ▶ Advisor: Saul Schleimer
Thesis: *Veering triangulations and polynomial invariants of three-manifolds*

University of Gdańsk, Poland *October 2015 - July 2017*
Mathematics, MSc ▶ Advisor: Michał Stukow
Thesis: *Roots in the mapping class group of a nonorientable surface*

University of Gdańsk, Poland *October 2012 - July 2015*
Mathematics, BSc ▶ Advisor: Witold Rosicki
Thesis: *Relations between knots and planar graphs: Tait's constructions, Fox colourings and quandles*

University of Gdańsk & Medical University of Gdańsk, Poland *October 2010 - July 2013*
Biotechnology, BSc ▶ Advisor: Stanisław Oldziej
Final project: *Phosphorylation-induced conformational changes of tau protein*

AWARDS FOR RESEARCH

- Craig A. Tracy Research Prize 2024 (University of California, Davis)
- Warwick Mathematics Institute 2022 Thesis Prize (University of Warwick)
- The Minister of Science and Higher Education Scholarship 2016/2017 (national, Poland)

RESEARCH INTERESTS

low-dimensional topology • dynamics on 3-manifolds • polynomial invariants of 3-manifolds • pseudo-Anosov flows • veering triangulations • mapping class groups

SOFTWARE

I regularly contribute to **Veering**, a Python package for working with transverse taut and veering ideal triangulations. For instance, I am the sole author of the `carried_surface` and `mutation` modules, and have collaborated with Saul Schleimer and Henry Segerman on a handful of other modules, including `flow_cycles`, `taut_polynomial`, and `veering_polynomial`.

Veering can be used to conduct computational experiments, test hypotheses, find examples of veering triangulations with specific properties, and formulate new conjectures based on generated data. Since it is freely available as a Python package, it is a useful resource for the wider mathematics community.

PAPERS AND PREPRINTS

1. *Arbitrarily large veering triangulations with a vanishing taut polynomial*
(26 pages) To appear in **Groups, Geometry, and Dynamics**. arXiv:2309.01752 [math.GT].
2. *Mutations and faces of the Thurston norm ball dynamically represented by multiple distinct flows*
(60 pages) To appear in **Geometry & Topology**. arXiv:2303.17665 [math.GT].
3. *The taut polynomial and the Alexander polynomial*
Journal of Topology, 16: 720-756 (2023). arXiv:2101.12162 [math.GT].
4. *Computation of the taut, the veering and the Teichmüller polynomials*
Experimental Mathematics, 33:1, 1-26 (2024). arXiv:2009.13558 [math.GT].
5. *Roots of Dehn twists on nonorientable surfaces* (with Michał Stukow)
Journal of Knot Theory and Its Ramifications, Vol. 28, No. 12, 1950077 (2019).
arXiv:1701.00531 [math.GT].
6. *Roots of crosscap slides and crosscap transpositions* (with Michał Stukow)
Periodica Mathematica Hungarica, Vol. 75, Issue 2, pp. 413 – 419 (2017).
arXiv:1601.06096 [math.GT].

TEACHING

University of California, Davis

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|-----------|---|
| 2024/2025 | Instructor, MAT21B Integral Calculus (2 × Fall, 1 × Spring)
Instructor, MAT21C Partial Derivatives and Series (1 × Spring) |
| 2023/2024 | Instructor, MAT21B Integral Calculus (1 × Fall, 1 × Spring)
Instructor, MAT108 Introduction to Abstract Mathematics (1 × Fall, 1 × Spring) |
| 2022/2023 | Instructor, MAT21A Differential Calculus (2 × Fall, 1 × Spring)
Instructor, MAT21B Integral Calculus (1 × Spring) |

University of Warwick

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|-----------|---|
| 2020/2021 | Teaching assistant, MA131 Analysis I (term 1) |
| 2019/2020 | Supervisor for 10 first year Maths undergraduates (2 groups, terms 1 & 2)
Teaching assistant, MA131 Analysis I (term 1)
Teaching assistant, MA131 Analysis II (term 2) |
| 2018/2019 | Supervisor for 10 first year Maths+Physics undergraduates (2 groups, terms 1 & 2)
Teaching assistant, MA3H6 Algebraic Topology (term 2) |

SERVICE

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| 2023/2024 | Mentor in the UC Davis Directed Reading Program (UC Davis, Fall and Winter) |
| 2021/2022 | Early Career Researcher Committee (Oxford)
Whitehead Library Committee (Oxford) |
| Dec 2021 | Undergraduate Admissions interviewer (Keble College, Oxford) |
| 2018/2019 | Organizer of the Topology Reading Seminar (Warwick) |

Additionally, I have refereed for multiple mathematical journals (either general or specializing in topology or dynamical systems) and for Mathematical Reviews.

TALKS

- 2024** Oct: Geometry/Topology seminar, UC Davis
Sep: Department Colloquium, Queen's University
Sep: Special seminars on Sep 9th and Sep 11th ($2 \times 1.5h$), Queen's University
Sep: Geometry and Topology Seminar, CIRGET, Université du Québec à Montréal
May: *St. Louis Topology Conference: Flows and Foliations in 3-manifolds*, WashU
Jan: Algebra and Number Theory Seminar, Oregon State University (virtual)
- 2023** Nov: *66th Texas Geometry and Topology Conference*, Rice University
Nov: Highway CA-17 Groups, Geometry, and Topology Seminar, SJSU&UC Santa Cruz
Sep: Topology Seminar, Oklahoma State University (virtual)
Sep: Geometric Topology Seminar, Columbia University
Sep: Geometry and Topology Seminar, Temple University
Sep: Topology/Geometry Seminar, Rutgers – New Brunswick
Jun: *Knots, Surfaces, and 3-Manifolds*, Casa Matemática Oaxaca
Apr: Australian Geometric Topology Webinar (virtual)
Apr: *Computational Problems in Low-dimensional Topology III*, Rutgers–Newark (short talk)
Mar: Topology seminar, UC Berkeley
Jan: *Oberwolfach: Low-dimensional topology* (short talk)
- 2022** Nov: Geometry/Topology seminar, UC Davis
Jul: *AMS-EMS-SMF International Meeting*, Grenoble
May: Geometry and Topology Seminar, University of Bristol
May: Junior Topology and Group Theory Seminar, University of Oxford
Apr: *Mapping class group and $Out(F_n)$* , Institut Henri Poincaré (short talk)
Mar: Geometry and Topology Seminar, Washington University in St. Louis (virtual)
- 2021** Nov: North Meets South Colloquium, University of Oxford
Jun: *Nearly Carbon Neutral Geometric Topology Conference* (virtual)
Apr: Topology and Geometric Group Theory Seminar, Cornell University (virtual)
Mar: Topology Seminar, University of Texas at Austin (virtual)
Feb: Topology Seminar, University of Oxford
Jan: Algebra/Topology Seminar, University of Copenhagen (virtual)
- 2020** Nov: Junior Topology and Group Theory Seminar, University of Oxford (virtual)
Nov: Topology Seminar, University of California Riverside (virtual)
Nov: Topology Seminar, Oklahoma State University (virtual)
- 2019** Oct: Bristol Junior Geometry Seminar, University of Bristol
May: Junior Geometry and Topology Seminar, University of Warwick
Feb: Mathematics Postgraduate Seminar, University of Warwick
- 2018** Jan: Junior Geometry and Topology Seminar, University of Warwick
- 2017** Jul: *Young Topologists Meeting*, Stockholm
- 2016** Sep: *The 19th International Workshop for Young Mathematicians*, Jagiellonian University
May: *18th Andrzej Jankowski Memorial Lecture Mini Conference*, University of Gdańsk
- 2015** Sep: *The 18th International Workshop for Young Mathematicians*, Jagiellonian University