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RESEARCH INTERESTS

Low-dimensional topology, in particular braids, notions of positivity for them, and knot concordance.

EDUCATION

07/2019 – present	PhD student in Mathematics at Eidgenössische Technische Hochschule Zürich (ETH Zürich), Zurich, Switzerland. Advisor: Peter Feller.
08/2016 – 02/2019	Master of Science in Mathematics at Universität Ulm (with distinction, 1.0), Ulm, Germany. Thesis: <i>Massey products and linking numbers</i> .
08/2017 – 05/2018	Master of Science in Mathematics (GPA 4.0) at Syracuse University, Syracuse, NY, USA.
10/2012 – 08/2016	Bachelor of Science in Mathematics (1.5) at Universität Ulm, Ulm, Germany. Thesis: <i>Das Existenzproblem von Hurwitz</i> .
09/2014 – 02/2015	Exchange semester at ETH Zürich, Zurich, Switzerland.
07/2012	Abitur (1.0) at Bertha-von-Suttner-Gymnasium, Neu-Ulm, Germany.

EMPLOYMENT

07/2019 – present	Teaching assistant at the Department of Mathematics, ETH Zürich, Zurich, Switzerland.
10/2013 – 04/2019	Teaching assistant at the Department of Mathematics and Economics, Universität Ulm, Ulm, Germany.
08/2017 – 05/2018	Teaching assistant at the Department of Mathematics, Syracuse University, Syracuse, NY, USA.
02/2015 – 04/2015	Internship at UZWR (Scientific Computing Centre Ulm) in Ulm, Germany. Project work on fluid dynamics using numerical methods.

PUBLICATIONS AND PREPRINTS

4. **3-braid knots with maximal 4-genus** (2023), with Sebastian Baader, Lukas Lewark, Filip Misev. Submitted. [ArXiv:2303.11918](https://arxiv.org/abs/2303.11918).
3. **Strongly quasipositive links are concordant to infinitely many strongly quasipositive links** (2022). Submitted. [ArXiv:2210.06612](https://arxiv.org/abs/2210.06612).
2. **On the nonorientable four-ball genus of torus knots** (2021), with Fraser Binns, Sungkyung Kang, and Jonathan Simone. Submitted. [ArXiv:2108.03674](https://arxiv.org/abs/2108.03674).
1. **The upsilon invariant at 1 of 3-braid knots** (2021). Accepted for publication in *Algebraic & Geometric Topology*. [ArXiv:2109.09187](https://arxiv.org/abs/2109.09187).

TALKS

- 09/2023 (planned) *TBA*, Swiss Knots, Universität Regensburg.
- 03/2023 *Strongly quasipositive knots are concordant to infinitely many strongly quasipositive knots*, The low dimensional workshop, Erdős Center, Alfréd Rényi Institute of Mathematics, Budapest.
- 02/2023 *Strongly quasipositive knots are concordant to infinitely many strongly quasipositive knots*, Winter Braids XII, Tours.
- 01/2023 *Strongly quasipositive knots are concordant to infinitely many strongly quasipositive knots*, Low dimensional topology, Mathematisches Forschungsinstitut Oberwolfach.
- 12/2022 *Strongly quasipositive knots are concordant to infinitely many strongly quasipositive knots*, Geometry and Topology Seminar, CIRGET, Université du Québec à Montréal, online.
- 11/2022 *Strongly quasipositive knots are concordant to infinitely many strongly quasipositive knots*, Paroles aux jeunes chercheuses et chercheurs en géométrie et dynamique, Orsay Mathematical Institute, Université Paris-Saclay.
- 10/2022 *Slice knots - knot theory in dimension 4*, Bern-Fribourg Graduate Seminar, Universität Bern.
- 09/2022 *Strongly quasipositive knots are concordant to infinitely many strongly quasipositive knots*, Minisymposium Algebra and Low-Dimensional Topology, DMV Annual Meeting 2022, Freie Universität Berlin.
- 06/2022 *Strongly quasipositive knots are concordant to infinitely many strongly quasipositive knots*, Surfaces in 4-manifolds, Le Croisic.
- 06/2022 *Concordance and alternation numbers of positive 3-braid knots (and a knot homology invariant)*, LKS-Seminar, Universität Regensburg.
- 05/2022 *Slice knots - knot theory in dimension 4*, Baby Geometri Seminar, Università di Pisa and Scuola Normale Superiore, Pisa.
- 05/2022 *The alternation number and the Upsilon-invariant at 1 of positive 3-braid knots*, Caltech GT Seminar, Caltech, online.
- 05/2022 *Concordance of positive 3-braid knots and a knot homology invariant*, Oberseminar Geometrie, Université de Fribourg.
- 05/2022 *The alternation number of positive 3-braid knots*, Swiss-Mathematical-Society Doctoral Day 2022, Université de Fribourg.
- 04/2022 *Slice knots - knot theory in dimension 4*, Bernoullis Tafelrunde, Universität Basel.
- 02/2022 *The alternation number and the Upsilon-invariant at 1 of positive 3-braid knots*, Knot Online Seminar (K-OS), online.
- 11/2021 *What is... a slice knot?*, Zurich Graduate Colloquium, ETH Zürich and Universität Zürich, Zurich.
- 09/2021 *Concordance of positive braid knots*, MATRIX-MFO Tandem Workshop: Invariants and Structures in Low-Dimensional Topology (hybrid meeting), Oberwolfach, short talk.
- 04/2021 *The upsilon invariants and alternation numbers of positive 3-braid knots*, AIM Research Community “4-Dimensional Topology”, online, lightning talk.
- 04/2021 *Positive 3-braid knots, their upsilon invariants and alternation numbers*, Geometric Topology Grad and Postdoc Seminar (GT GAPS), online.

AWARDS

2017	Fulbright Travel Grant.
2014 – 2017	Talanx Scholarship.
2013 – 2014	Deutschlandstipendium: Ulm University and Ernst & Young Foundation Scholarship.
2012 – 2013	Deutschlandstipendium: Ulm University and Rotary Club Ulm Scholarship.

TEACHING EXPERIENCE

	ETH Zürich
Spring 2022	Course organizer for <i>Analysis II</i> (Civil/Geospatial/Environmental Engineering Bachelor).
Fall 2021	Course organizer for <i>Analysis I</i> (Civil/Geospatial/Environmental Engineering Bachelor).
09/2021	Certificate <i>Learning to Teach</i> . Programme for Doctoral Teaching Assistants at ETH Zürich. Course leader: Julia Kuark. Duration: 3 classroom days + 12 hours of independent study.
Spring 2021	Course organizer for <i>Topology</i> .
Fall 2020	Course organizer for <i>Linear Algebra I</i> .
Spring 2020	Course organizer for <i>Algebraic Topology II</i> .
Fall 2019	Teaching assistant for <i>Complex Analysis</i> .
	Syracuse University
Spring 2018	Teaching assistant for <i>Calculus III</i> .
Fall 2017	Teaching assistant for <i>Calculus III</i> .
	Universität Ulm
Fall 2013 - Spring 2019	Student teaching assistant for <i>Analysis I-III</i> , <i>Linear Algebra I-II</i> . Correcor, tutor in Matlab and exercise group leader.

PROFESSIONAL SERVICE AND OUTREACH

08/2021 – present	Elected member of the Nachdiplom Lectures Committee at the Department of Mathematics of ETH Zürich.
09/2020 – present	Co-organizer of the Geometry Graduate Colloquium at ETH Zürich (funded by the Zurich Graduate School in Mathematics).
05/2020 – present	Board member of the Association of the Mid-level Academic Faculty at the Department of Mathematics (VMM) of ETH Zürich.
03/2023	<i>Work as a PhD Student</i> , short talk at the MindPhair 2023 at ETH Zürich (yearly job-fair for mathematicians, physicists and computational scientists at ETH Zürich).
10/2022	Co-organizer of the D-MATH (Post)Doctoral Welcome Day at ETH Zürich.
05/2021 – 05/2022	Representative of the Mid-level Academic Faculty in the Department Conference of the Department of Mathematics of ETH Zürich.
03/2022	<i>Work as a PhD Student</i> , short talk at the MindPhair 2022 at ETH Zürich.

RESEARCH SEMESTER

Participant in the “4-Dimensional Topology” AIM Online Research Community organized by Miriam Kuzbary, Maggie Miller, Juanita Pinzón-Caicedo and Hannah Schwartz in Spring 2021.