

📍 Max Planck Institute for Mathematics, Vivatsgasse 7, 53111 Bonn, Germany

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RESEARCH INTERESTS

Low-dimensional topology, in particular braids, knots and links, surfaces, knot concordance and four-ball genus, Khovanov and Heegaard Floer homology, braid groups and Garside structures, 3- and 4-manifolds.

EDUCATION

- 07/2019 – 06/2023 **Doctor of Science** in Mathematics at [ETH Zurich](#), Zurich, Switzerland.
Thesis: *On notions of braid positivity and knot concordance*. Advisor: Peter Feller.
- 08/2016 – 02/2019 **Master of Science** in Mathematics at [Ulm University](#) (1.0, with distinction), Ulm, Germany. Minor: Computer Science.
Thesis: *Massey products and linking numbers*. Supervisor: Stefan Wewers.
- 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 [Ulm University](#), Ulm, Germany. Minor: Physics.
Thesis: *Das Existenzproblem von Hurwitz*. Supervisor: Stefan Wewers.
- 09/2014 – 02/2015 **Visiting semester** at [ETH Zurich](#), Zurich, Switzerland.
- 07/2012 **Abitur** (1.0) at Bertha-von-Suttner-Gymnasium, Neu-Ulm, Germany.

EMPLOYMENT

- 10/2023 – 09/2025 **Postdoctoral fellow** at the [Max Planck Institute for Mathematics \(MPIM\)](#), Bonn, Germany.
- 07/2019 – 07/2023 **Scientific assistant** at the Department of Mathematics, [ETH Zurich](#), Zurich, Switzerland.
- 10/2013 – 04/2019 **Teaching assistant** at the Department of Mathematics and Economics, [Ulm University](#), 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.

RESEARCH SEMESTER

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

PUBLISHED AND ACCEPTED PAPERS

3. **On the nonorientable four-ball genus of torus knots**, with F. Binns, S. Kang, and J. Simone. *Algebr. Geom. Topol.* (in press). [ArXiv:2108.03674](#).
2. **3-braid knots with maximal 4-genus**, with S. Baader, L. Lewark, F. Misev. *Trans. Amer. Math. Soc. Ser. B* 11 (2024), pp. 600–621.
1. **The epsilon invariant at 1 of 3-braid knots**. *Algebr. Geom. Topol.* 23.8 (2023), pp. 3763–3804.

Preprint versions of these articles are available on [arXiv](#).

PREPRINTS

3. **Algorithms in 4-manifold topology**, with S. Bastl*, R. Burke, R. Chatterjee, S. Dey, A. Durst*, S. Friedl, D. Galvin, A. García Rivas*, T. Hirsch*, C. Hobohm*, C.-S. Hsueh, M. Kegel, F. Kern*, S. M. S. Lee*, C. Löh, N. Manikandan, L. Mousseau*, L. Munser, M. Pencovitch, P. Perras*, M. Powell, J. P. Quintanilha, L. Schambeck*, D. Suchodoll, M. Tancer, A. Thiele*, M. Uschold, S. Veselá, M. Weiß*, M. von Wunsch-Rolshoven*, where (*) denotes student co-authorship. Submitted. [ArXiv:2411.08775](#).
2. **Minimal cobordisms between thin and thick torus knots**, with S. Baader, L. Lewark, F. Misev. Submitted. [ArXiv:2405.13719](#).
1. **Strongly quasipositive links are concordant to infinitely many strongly quasipositive links**. Submitted. [ArXiv:2210.06612](#).

CONFERENCE PROCEEDINGS (NOT PEER-REVIEWED)

5. **MATRIX-MFO Tandem Workshop: Invariants in Low-Dimensional Topology. Combinatorics, Geometry, and Computation**, with S. Friedl, J. Licata, S. Tillmann. *Oberwolfach Rep.* (in press).
4. **Obstructing ribbon clasp number one**, with D. Celoria, A. Di Prisa, J. Howie, J. Licata, F. Misev, L. Schambeck, L. Wakelin. *Oberwolfach Rep.* (in press).
3. **Notions of braid positivity and knot concordance**. *Oberwolfach Rep.* (in press).
2. **Strongly quasipositive knots are concordant to infinitely many strongly quasipositive knots**. *Oberwolfach Rep.* 20 (2023), no. 1, pp. 172–174.
1. **Concordance of positive braid knots**. *Oberwolfach Rep.* 18 (2021), no. 3, pp. 2360–2362.



SELECTED 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.

INVITED TALKS AT CONFERENCES AND WORKSHOPS

- 11/2024 [IberoSing International Workshop 2024: Low-dimensional Topology & Singularity Theory](#), Madrid.
- 07/2024 [Mini-symposium *Knot theory and low dimensional manifolds*](#), [European Congress of Mathematics](#), Seville.
- 04/2024 [NRW Topology Meeting](#), Wuppertal.
- 04/2024 [Manifolds and groups in Bologna II](#), Bologna.
- 09/2023 [Leaning into Topology Workshop](#), Pisa.
- 09/2023 [Swiss Knots](#), Regensburg.
- 06/2023 [Mini Workshop](#), Bern.
- 03/2023 [The low dimensional workshop](#), Budapest, .
- 11/2022 [Paroles aux jeunes chercheuses et chercheurs en géométrie et dynamique](#), Orsay.
- 09/2022 [Minisymposium *Algebra and Low-Dimensional Topology*](#), [DMV Annual Meeting 2022](#), Berlin.
- 06/2022 [Surfaces in 4-manifolds](#), Le Croisic.

INVITED TALKS IN SEMINARS

- 12/2024 (planned) [Oberseminar Topologie](#), University of Bonn.
- 09/2024 [Séminaire de Géométrie, Algèbre, Dynamique et Topologie](#), Dijon.
- 05/2024 [Séminaire de Géométrie et Topologie de Marseille](#), Marseille.
- 05/2024 [Oberseminar Topologie](#), Münster.
- 04/2024 [Glasgow Geometry & Topology Seminar](#), Glasgow.
- 03/2024 [MPIM Oberseminar](#), MPIM Bonn.
- 11/2023 [MPIM Topology Seminar](#), MPIM Bonn, short talk.
- 05/2023 [Low-dimensional topology seminar](#), MPIM Bonn.
- 12/2022 [Geometry and Topology Seminar](#), CIRGET, Montréal, online, .
- 06/2022 [LKS-Seminar](#), Regensburg.
- 05/2022 [Caltech GT Seminar](#), Caltech, online.
- 05/2022 [Oberseminar Geometrie](#), Fribourg.
- 02/2022 [Knot Online Seminar \(K-OS\)](#), online, .
- 04/2021 [AIM Online Research Community 4-Dimensional Topology](#), lightning talk.

INVITED TALKS AT GRADUATE COLLOQUIA

- 12/2023 [Pitt AWM Student Seminar](#), Pittsburgh, online.
- 10/2023 [Geometry Graduate Colloquium](#), ETH Zurich.
- 10/2022 [Bern–Fribourg Graduate Seminar](#), Bern.
- 05/2022 [Baby Geometri Seminar](#), Pisa.
- 04/2022 [Bernoullis Tafelrunde](#), Basel.
- 11/2021 [Zurich Graduate Colloquium](#), Zurich.
- 04/2021 [Geometric Topology Grad and Postdoc Seminar \(GT GAPS\)](#), online.

CONTRIBUTED TALKS AT CONFERENCES AND WORKSHOPS

- 02/2024 BTW4: Knot Floer Homology, Besse.
02/2023 Winter Braids XII, Tours.
01/2023 Low dimensional topology, MFO Oberwolfach.
05/2022 Swiss-Mathematical-Society Doctoral Day 2022, Fribourg.
04/2022 BTW2: Sliceness, exotic pairs, and quantum invariants, Aussois.
09/2021 MATRIX-MFO Tandem Workshop: Invariants and Structures in Low-Dimensional Topology, MFO Oberwolfach, short talk.

TEACHING EXPERIENCE

- University of Bonn/MPIM Bonn**
- 06/2024 – 06/2025 Supervision of **Master thesis** on *Linking number obstructions to satellite homomorphisms* by Frieda Kern (co-supervision with Peter Teichner).
Winter 2024/25 Lecturer for **Topics in 3-manifold topology** (Module V5D2 *Selected Topics in Topology*, Master in Mathematics).
- ETH Zurich**
- Spring 2022 Course organizer for **Analysis II** (Bachelor in Civil, Geospatial, or Environmental Engineering).
Fall 2021 Course organizer for **Analysis I** (Bachelor in Civil, Geospatial, or Environmental Engineering).
Spring 2021 Course organizer for **Topologie** (Bachelor in Mathematics).
Fall 2020 Course organizer for **Lineare Algebra I** (Bachelor in Mathematics, Physics, or Interdisciplinary Sciences).
Spring 2020 Course organizer for **Algebraic Topology II** (Bachelor or Master in Mathematics).
Fall 2019 Teaching assistant for **Complex Analysis** (Bachelor in Mathematics, Physics, or Interdisciplinary Sciences).
- Syracuse University**
- Spring 2018 Teaching assistant for **Calculus III**.
Fall 2017 Teaching assistant for **Calculus III**.
- Ulm University**
- Summer 2019 Instructor for **Linear Algebra Review Course** (Computer Science and Engineering Bachelor).
Winter 2013/14 – Student teaching assistant for **Analysis I-III** and **Linear Algebra I-II**
Summer 2019

TEACHER TRAINING

- Winter 2024/25 Participation in the **Teaching Mentoring Program** at the Hausdorff School for Mathematics in Bonn.
Mentors: Viktoriya Ozornova and Arunima Ray (both MPIM Bonn).
09/2021 Certificate **Learning to Teach**.
Program for doctoral teaching assistants at ETH Zurich. Teaching project: *How to teach writing proofs—classroom assessment techniques in mathematics classes*.

OUTREACH ACTIVITIES

- 03/2025 (planned) Invited panelist for panel discussion on “*What is mathematics research like?*” at **Graduate Research Opportunities for Women at Frankfurt 2025** (GROW@Frankfurt 2025).
- 12/2024 Invited speaker at **Tea Time with Women in Mathematics** (networking event for women in mathematics in Bonn).
- 04/2024 Volunteer at the mentoring lunch of **Graduate Research Opportunities for Women at Bonn 2024** (GROW@Bonn 2024).
- 03/2023 *Work as a PhD Student*, short talk at the **MindPhair 2023** at ETH Zurich (job-fair for mathematicians, physicists and computational scientists).
- 03/2022 *Work as a PhD Student*, short talk at the **MindPhair 2022** at ETH Zurich.

CONFERENCE AND SEMINAR ORGANIZATION

- 10/2023 – present Co-organizer of the **Low-dimensional topology seminar** at MPIM Bonn.
- 09/2024 Co-organizer of the **MATRIX-MFO Tandem Workshop: Invariants in Low-Dimensional Topology. Combinatorics, Geometry, and Computation** at Mathematisches Forschungsinstitut Oberwolfach, Sept 22–27, 2024 (joint with Stefan Friedl, Joan Licata and Stephan Tillmann).
- 09/2020 – 07/2023 Co-organizer of the **Geometry Graduate Colloquium** at ETH Zurich (funded by the Zurich Graduate School in Mathematics)

OTHER ACADEMIC SERVICE AND ACTIVITIES

- 2024 – present Reviewer for *zbMATH Open*.
- 2024 Referee for *Pacific Journal of Mathematics*.
- MPIM Bonn**
- 09/2024 Member of the Postdoc Election Committee.
- ETH Zurich**
- 09/2021 – 07/2023 Co-organizer of get-togethers for women in math at ETH Zurich and the University of Zurich (funded by the Zurich Graduate School in Mathematics).
- 08/2021 – 07/2023 Elected member of the Nachdiplom Lectures Committee at the Department of Mathematics.
- 05/2020 – 05/2023 Member of the Board of the Association of the Mid-level Academic Faculty at the Department of Mathematics (VMM).
- 10/2022 Co-organizer of the first D-MATH (Post)Doctoral Welcome Day.
- 05/2021 – 05/2022 Mid-level faculty representative in the Department Conference of the Department of Mathematics.
- Ulm University**
- 10/2016 – 07/2017 Member of the Mathematics Student Council (Fachschaft Mathematik) at the Department of Mathematics and Economics.