

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

✉ paulagtruoel@gmail.com 🌐 <https://guests.mpim-bonn.mpg.de/truoel/>

RESEARCH INTERESTS

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

EMPLOYMENT

- 12/2025 – 11/2027 **Postdoctoral fellow** at the [University of Glasgow](#), Glasgow, UK.
Supported by SNSF Postdoc.Mobility fellowship 230329.
- 10/2023 – 11/2025 **Postdoctoral fellow** at the [Max Planck Institute for Mathematics \(MPIM\)](#), Bonn, Germany. Mentor: Arunima Ray.
- 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 [UZR](#) (Scientific Computing Centre Ulm) in Ulm, Germany. Project work on fluid dynamics using numerical methods.

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.

RESEARCH SEMESTER

Participant in the **AIM Online Research Community** *4-Dimensional Topology* organized by Miriam Kuzbary, Maggie Miller, Juanita Pinzón-Cañedo 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 upsilon 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 (SUBMITTED)

4. **Non-complex cobordisms between quasipositive knots**, with M. Borodzik. [ArXiv:2504.04894](#).
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. [ArXiv:2411.08775](#).
2. **Minimal cobordisms between thin and thick torus knots**, with S. Baader, L. Lewark, F. Misev. [ArXiv:2405.13719](#).
1. **Strongly quasipositive links are concordant to infinitely many strongly quasipositive links**. [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.* 21 (2024), no. 3, pp. 2511–2550.
4. **Obstructing ribbon clasp number one**, with D. Celoria, A. Di Prisa, J. Howie, J. Licata, F. Misev, L. Schambeck, L. Wakelin. *Oberwolfach Rep.* 21 (2024), no. 3, pp. 2511–2550.
3. **Notions of braid positivity and knot concordance**. *Oberwolfach Rep.* 21 (2024), no. 3, pp. 2511–2550.
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

12/2025 – 11/2027	Swiss National Science Foundation Postdoc.Mobility fellowship. Project 230329: Concordance of braid positive knots.
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 <i>Knot theory and low dimensional manifolds</i> , 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 <i>Algebra and Low-Dimensional Topology</i> , DMV Annual Meeting 2022 , Berlin.
06/2022	Surfaces in 4-manifolds , Le Croisic.

INVITED TALKS IN SEMINARS

07/2025 (planned)	Oberseminar Global Analysis and Geometry , Regensburg.
06/2025 (planned)	Séminaire Géométrie des Espaces Singuliers , Lille.
05/2025 (planned)	Geometry seminar , ETH Zurich.
12/2024	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	
Winter 2024/25	Lecturer for Topics in 3-manifold topology (Module V5D2 <i>Selected Topics in Topology</i> , 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 Topology (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 – Summer 2019	Student teaching assistant for Analysis I-III and Linear Algebra I-II .

SUPERVISION

	University of Bonn/MPIM Bonn
02/2025 – 09/2025	Supervision of Master thesis by Chiara Donatone.
06/2024 – 06/2025	Supervision of Master thesis on <i>Linking number obstructions to satellite homomorphisms</i> by Frieda Kern (co-supervision with Peter Teichner).

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: <i>How to teach writing proofs—classroom assessment techniques in mathematics classes</i> .

OUTREACH ACTIVITIES

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

2024 – present Reviewer for *zbMATH Open*.

MPIM Bonn

09/2024 Member of the Postdoc Representative Selection 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.

REFERENCES

Peter Feller, University of Neuchâtel

Matthew Hedden, Michigan State University

Lukas Lewark, ETH Zurich

Viktoriya Ozornova, MPIM Bonn (Teaching)

Arunima Ray, University of Melbourne

peter.feller@unine.ch.

mhedden@math.msu.edu.

lukas.lewark@math.ethz.ch.

viktoriya.ozornova@mpim-bonn.mpg.de.

aru.ray@unimelb.edu.au.