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### Professional Experience

- 2019– Assistant Professor at the Swiss Federal Institute of Technology in Zürich.  
PI of the SNSF *Eccellenza Professorial Fellowship* project 181199.
- 2017–2019 Postdoctoral Fellow at the Swiss Federal Institute of Technology in Zürich.
- 2016–2017 Postdoctoral Fellow at the Max Planck Institute for Mathematics in Bonn (MPIM).
- 2014–2016 Postdoctoral Fellow at Boston College, supported by the SNSF Project 155477.
- 2010–2014 Teaching Assistant Coordinator at the Mathematical Institute of the University of Bern.
- 2007–2014 Teaching Assistant at the Mathematical Institute of the University of Bern.

### Education

- 2010–2014 PhD in Mathematics at the University of Bern advised by Prof. Dr. Sebastian Baader.
- 2008–2010 MSc in Mathematics at the University of Bern.
- 2005–2008 BSc in Mathematics at the University of Bern. Minors: Physics and Philosophy.

### Awards and Grants

- 2018 Swiss National Science Foundation *Eccellenza Professorial Fellowship*. Project 181199.
- 2015 Research grant and invitation as a research fellow to the Max Planck Institute for Mathematics in Bonn for the academical year 2016/2017.
- 2014 Swiss National Science Foundation *Early Postdoc.Mobility-Grant*. Project 155477.
- 2011 Faculty prize for the Master Thesis *Konstruktion von Elementen in Homotopiegruppen von Sphären* awarded by the Faculty of Natural Sciences of the University of Bern.

### Activities

- Reviewer for *MathSciNet* and for *Zentralblatt MATH*.
- Referee for peer reviewed journals.
- Conference organizer: *Winter Braids XIII* in Montpellier in 2023, *Swiss Knots 2023* in Regensburg, *Swiss Knots 2021* in Fribourg. *Workshop on low-dimensional topology* in Regensburg in 2019, *Swiss Knots 2019* at ETHZ, *Swiss Knots 2017* at the University of Bern, and *4-manifolds and knot concordance* at the MPIM in Bonn in 2016.

### Invited talks at conferences, seminars, and colloquia

- 2023 Algebra and Geometry Seminar, University of Basel. Colloquium, University of Neuchâtel. Geometry and Topology Seminar, Bristol University. SMS Fall Meeting: Swiss Geometry Day, UniDistance, Brig. Leaning into topology workshop, University of Pisa. Group actions and low-dimensional topology, Ian Agol Laboratory - Instituto de Ciencias Matemáticas. Interactions of Low-dimensional Topology and Quantum Field Theory, SwissMAP Research Station. Mathematics Colloquium, UniDistance, Brig. Topology and Geometry Seminar, University of Geneva. Singularities and Low Dimensional Topology, Erdős Center research semester, Budapest.
- 2022 Floer Homotopical Methods in Low Dimensional and Symplectic Topology Workshop, MSRI. Geometric Topology Seminar, Columbia University, New York. Symplectic Geometry, Gauge Theory, and Low-Dimensional Topology Seminar, Stony Brook University. Low-dimensional topology seminar, MPIM. Conference on surfaces in 4-manifolds, Le Croisic. Georgia Topology Conference, University of Georgia in Athens. Braids in Low-Dimensional Topology, conference of the ICERM semester BRAIDS, Brown University. Geometry/Topology Seminar, Brown University. Geometry and Topology Seminar, Boston College. Colloquium of the ICERM Semester BRAIDS, Brown University. Geometry Seminar, University of Coimbra.

- 2021 Topology Seminar, University of Grenoble. Geometry and Topology seminar, University of Quebec in Montreal. Invariants and Structures in Low-Dimensional Topology, Mathematisches Forschungsinstitut Oberwolfach. Mini-Symposium: Low-Dimensional Topology, 8th European Congress of Mathematics. Topology Seminar, University of Iowa. Geometry and Topology Seminar, Georgia Institute of Technology. Knot Online Seminar, University of Geneva.
- 2020 Geometry Seminar, University of Virginia. Knot theory seminar, University of Warsaw. Mini-Symposium: Knot Theory on Okinawa, Okinawa Institute of Science and Technology. Geometry and Topology Seminar, Paris 6 at Jussieu.
- 2019 Colloquium, University of Fribourg. Oberseminar Topologie, Max Planck Institute for Mathematics, Bonn. Oberseminar Globale Analysis, University of Regensburg. Geometry and Topology Seminar, Boston College. Topology Seminar, University of Texas, Austin. Topology Seminar, UCLA. Topology Seminar, Rice University. Symplectic Geometry, Gauge Theory, and Categorification Seminar, Columbia University. Topology Seminar, University of Quebec in Montreal. Spring Trisectors Meeting, conference merged with Geometry and Topology Seminar, University of Georgia. Geometry and Topology Seminar, Georgia Institute of Technology.
- 2018 Topology, Geometry and Algebra Seminar, University of Nantes. Geometry and Topology Seminar, Technion. Topologie, Mathematisches Forschungsinstitut Oberwolfach. Algebraic Geometry Seminar, University of Basel. Oberseminar Topologie, Max Planck Institute for Mathematics, Bonn. Ergodic and Geometric Group Theory Seminar, EPF Lausanne. Geometry and Topology Seminar, Boston College. Topology and Geometry Seminar, University of Neuchatel. Knotted embeddings in dimensions 3 and 4, conference of the thematic month on low dimensional topology and related topics, CIRM, Luminy. Winter Braids VIII, CIRM, Luminy.
- 2017 Geometry and Topology Seminar, University of Geneva. Knot Theory Seminar, University of Warsaw. Geometry and Topology Seminar, Durham University. Seminar of SFB1085: Higher Invariants—Interactions between arithmetic geometry and global analysis, University of Regensburg. Mathematical Colloquium, University of Hamburg. Number Theory and Algebraic Geometry Seminar, Boston College. Topology Seminar, UQAM, Montreal. Topology Seminar, Indiana University. Topology Seminar, Princeton University. Geometry, Dynamics, and Topology Seminar, Aix-Marseille University. Oberseminar Geometrie, LMU München. Oberseminar, Max Planck Institute for Mathematics, Bonn.
- 2016 Algebra and Geometry Seminar, University of Basel. Topology Seminar, Max Planck Institute for Mathematics, Bonn. 12th William Rowan Hamilton Geometry and Topology Workshop, Trinity College, Dublin. Geometry and Topology Seminar, University of California, Davis. Topology Seminar, University of Georgia, Athens. Synchronizing Smooth and Topological 4-Manifolds, BIRS workshop. Geometry and Topology Seminar, Boston College. Topology Seminar, Princeton University.
- 2015 Mathematical Colloquium, University of Bern. Knots in Washington XLI, George Washington University. Topology Seminar, Rice University, Houston. American Mathematical Society Central Fall Sectional Meeting, Rutgers University. Caltech Geometry and Topology Seminar, Pasadena. American Mathematical Society Central Fall Sectional Meeting, Loyola University, Chicago. 11th William Rowan Hamilton Geometry and Topology Workshop, Trinity College, Dublin. Swiss Knots 2015, University of Geneva. Mathematics Seminar of the Montana State University, Bozeman. Topology Seminar, Syracuse University. Topology Seminar, Brandeis University, Waltham.
- 2014 Topology Seminar, University of Texas, Austin. Geometry and Topology Seminar, Boston College. Winter Braids IV, University of Burgundy, Dijon.
- 2013 Dynamical Systems and Geometry Seminar, Warsaw University. Low-dimensional Topology and Geometry in Toulouse, University of Toulouse.
- 2012 Algebra and Geometry—Workshop of the Swiss Doctoral Program in Mathematics, University of Bern.

2011 Knot Theory Seminar, University of Geneva. 8th Graduate Colloquium of the Swiss Doctoral Program in Mathematics, University of Basel.

### Publications and Preprints

- 2023 with M. Aka, A. B. Miller, and A. Wieser. Seifert surfaces in the four-ball and composition of binary quadratic forms. *ArXiv e-print*. ArXiv:2311.17746 [math.GT].  
with D. Hubbard and H. Turner. The Dehn twist coefficient for big and small mapping class groups. *ArXiv e-print*. ArXiv:2308.06214 [math.GT].  
with A. Sisto and G. Viaggi. Hyperbolic Heegaard splittings and Dehn twists. *ArXiv e-print*. ArXiv:2304.05990 [math.GT].  
with S. Baader. Asymptotics of the smooth  $A_n$ -realization problem. *ArXiv e-print*. ArXiv:2303.15434 [math.GT].
- 2022 The slice-Bennequin inequality for the fractional Dehn twist coefficient. *ArXiv e-print*. ArXiv:2204.05288 [math.GT].  
with L. Lewark and A. Lobb. On the values taken by slice torus invariants. *Math. Proc. Cambridge Philos. Soc.*, accepted for publication. ArXiv:2202.13818 [math.GT].  
with L. Lewark and A. Lobb. Squeezed knots. *Quantum Topol.*, accepted for publication. ArXiv:2202.12289 [math.GT].
- 2020 with J. Park and M. Powell. The  $\mathbb{Z}$ -genus of boundary links. *Rev. Mat. Complut.*, 36 (2023), no. 1, 1-25. ArXiv:2012.14367 [math.GT].  
with D. Hubbard. Examples of non-minimal open books with high fractional Dehn twist coefficient. *New York J. Math.*, accepted for publication. ArXiv:2010.07869 [math.GT].  
with J. Park. A note on the four-dimensional clasp number of knots. *Math. Proc. Cambridge Philos. Soc.*, 173 (2022), no. 1, 213–226. DOI: 10.1017/S0305004121000529. ArXiv:2009.01815 [math.GT].  
with I. van Santen. Existence of Embeddings of Smooth Varieties into Linear Algebraic Groups. *J. Algebraic Geom.*, 32 (2023), no. 4, 729-786. DOI: <https://doi.org/10.1090/jag/793>. ArXiv:2007.16164 [math.AG].  
with S. Baader and L. Ryffel. Bouquets of curves in surfaces. *Glasg. Math. J.*, published online. DOI: <https://doi.org/10.1017/S001708952200012X>. ArXiv:2007.10429 [math.GT].  
with A. Sisto and G. Viaggi. Uniform models and short curves for random 3-manifolds. *ArXiv e-print*. ArXiv:1910.09486 [math.GT].  
with A. N. Miller, M. Nagel, P. Orson, M. Powell, and A. Ray. Embedding spheres in knot traces. *Compos. Math.*, 157 (2021), no. 10, 2242-2279, 2021 DOI: 10.1112/S0010437X21007508. ArXiv:2004.04204 [math.GT].  
with M. Golla. Non-orientable slice surfaces and inscribed rectangles. *Ann. Sc. Norm. Super. Pisa Cl.*, accepted for publication. ArXiv:2003.01590 [math.GT].
- 2019 with J. Park. Genus one cobordisms between torus knots. *Int. Math. Res. Not.* 2021, no. 1, 523–550. DOI: 10.1093/imrn/rnaa027/5766447. ArXiv:1910.01672 [math.GT].  
with A. N. Miller and J. Pinzon-Caicedo. A note on the topological slice genus of satellite knots. *Algebr. Geom. Topol.*, 22 (2022), no. 2, 709-738. DOI: 10.2140/agt.2022.22.709. ArXiv:1908.03760 [math.GT].  
with L. Lewark. Balanced algebraic unknotting, linking forms, and surfaces in three- and four-space. *J. Differential Geometry*, accepted for publication. ArXiv:1905.08305 [math.GT].
- 2018 with L. Lewark and A. Lobb. Almost positive links are strongly quasipositive. *Math. Ann.*, published online. DOI: 10.1007/s00208-021-02328-x. ArXiv:1809.06692 [math.GT].  
with M. Borodzik. Up to topological concordance links are strongly quasipositive. *J. Math. Pures Appl.*, 132 (2019), 273-279.

- DOI: 10.1016/j.matpur.2019.03.001. ArXiv:1802.02493 [math.GT].
- 2017 with M. Klug, T. Schirmer, and D. Zemke. Calculating the homology and intersection form of a 4-manifold from a trisection diagram.  
*Proc. Natl. Acad. Sci. USA*, 115 (2018), no. 43, 10869–10874.  
 DOI: 10.1073/pnas.1717176115. ArXiv:1711.04762 [math.GT].
- with D. Hubbard. Braids with as many full twists as strands realize the braid index.  
*J. Topol.*, 12 (2019), no. 4, 1069–1092.  
 DOI: 10.1112/topo.12112. ArXiv:1708.04998 [math.GT].
- 2016 with L. Lewark. On classical upper bounds for slice genera.  
*Selecta Math.*, 24 (2018), no. 5, 4885–4916.  
 DOI: 10.1007/s00029-018-0435-x. ArXiv:1611.02679 [math.GT].
- with S. Baader, L. Lewark, and R. Zentner. Khovanov width and dealternation number of positive braid links. *Math. Res. Lett.*, Volume 26 (2019), no. 3, 627–641.  
 DOI: 10.4310/MRL.2019.v26.n3.a1 ArXiv:1610.04534 [math.GT].
- with I. van Santen né Stampfli. Uniqueness of embeddings of the affine line into algebraic groups. *J. Algebraic Geom.*, 28 (2019), no. 4, 649–698.  
 DOI: 10.1090/jag/725. ArXiv:1609.02113 [math.AG].
- with J. Park and A. Ray. On the Upsilon invariant and satellite knots.  
*Math. Z.*, 292 (2018), no. 3–4, 1431–1452.  
 DOI: 10.1007/s00209-018-2145-7. ArXiv:1604.04901 [math.GT].
- with D. Kratovich. On cobordisms between knots, braid index, and the Upsilon-invariant.  
*Math. Ann.*, 369 (2017), no. 1–2, 301–329.  
 DOI: 10.1007/s00208-017-1519-1. ArXiv:1602.02637 [math.GT].
- 2015 with S. Baader, L. Lewark, and L. Liechti. On the topological 4-genus of torus knots.  
*Trans. Amer. Math. Soc.*, 370 (2018), no. 4, 2639–2656.  
 DOI: 10.1090/tran/7051. ArXiv:1509.07634 [math.GT].
- with S. Pohlman and R. Zentner. Alternation numbers of torus knots with small braid index.  
*Indiana Univ. Math. J.*, 67 (2018), no. 2, 645–655.  
 DOI: 10.1512/iumj.2018.67.7302. ArXiv:1508.05825 [math.GT].
- with D. McCoy. On 2-bridge knots with differing smooth and topological slice genera.  
*Proc. Amer. Math. Soc.* 144 (2016), 5435–5442.  
 DOI: 10.1090/proc/13147. ArXiv:1508.01431 [math.GT].
- A sharp signature bound for positive four-braids. *Q. J. Math.*, 69 (2018), no. 1, 271–283.  
 DOI: 10.1093/qmath/hax036/4097999. ArXiv:1508.00418 [math.GT].
- The degree of the Alexander polynomial is an upper bound for the topological slice genus.  
*Geom. Topol.* 20 (2016), no. 3, 1763–1771.  
 DOI: 10.2140/gt.2016.20.1763. ArXiv:1504.01064 [math.GT].
- Optimal cobordisms between torus knots. *Comm. Anal. Geom.* 24 (2016), no. 5, 993–1025.  
 DOI: 10.4310/CAG.2016.v24.n5.a4. ArXiv:1501.00483 [math.GT].
- 2014 with I. van Santen né Stampfli. Holomorphically equivalent algebraic embeddings.  
*ArXiv e-print*. ArXiv:1409.7319 [math.AG].
- with L. Liechti. Signature and the Alexander polynomial. Appendix to L. Liechti’s Signature, positive Hopf plumbing and the Coxeter transformation.  
*Osaka J. Math.* 53 (2016), no. 1, 251–266. ArXiv:1401.5336 [math.GT].
- 2013 The signature of positive braids is linearly bounded by their first Betti number.  
*Internat. J. Math.* 26 (2015), no. 10, 1550081.  
 DOI: 10.1142/S0129167X15500810. ArXiv:1311.1242 [math.GT].
- Gordian adjacency for torus knots. *Algebr. Geom. Topol.* 14 (2014), no. 2, 769–793.  
 DOI: 10.2140/agt.2014.14.769. ArXiv:1301.5248 [math.GT].