

University of Neuchâtel, Mathematical Institute

<https://www.unine.ch/math/en/pfeller>**Professional Experience**

- 2025– Professor at the University of Neuchâtel.
- 2019–2025 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.
- 2008–2010 MSc in Mathematics at the University of Bern.
- 2005–2008 BSc in Mathematics at the University of Bern. Minors: Physics and Philosophy.

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.

Event organisation

- 2027 *Swiss Knots 2027*, conference on low-dimensional topology, University of Neuchâtel.
- 2026– The *Triangle-Seminar: Geometry and Topology in BeNeFri*.
- 2025 *SMS Fall Meeting 2025: Swiss Geometry Day*, University of Neuchâtel.
Swiss Knots 2025, University of Geneva.
- 2023 *Winter Braids XIII*, University of Montpellier. *Swiss Knots 2023*, University of Regensburg.
- 2021 *Swiss Knots 2021*, University of Fribourg.
- 2019 *Workshop on low-dimensional topology*, University of Regensburg.
Swiss Knots 2019, ETH Zürich.
- 2017 *Swiss Knots 2017*, University of Bern.
- 2016 *4-manifolds and knot concordance*, conference on topology, MPIM, Bonn.

Publications*Articles in peer-reviewed journals*

- 2025 with L. Lewark and M. Orbegoza Rodriguez. Homogeneous braids are visually prime.
J. Topol., 18 (2025), no. 3, Paper No. e70040.
DOI: 10.1112/topo.70040. ArXiv:2408.15730 [math.GT].
- with D. Hubbard and H. Turner. The Dehn twist coefficient for big and small mapping class groups. *J. London Math. Soc.*, 112 (2025), no. 2, Paper No. e70251.
DOI: 10.1112/jlms.70251. ArXiv:2308.06214 [math.GT].

- with S. Baader. Asymptotics of the smooth A_n -realization problem.
Ann. Henri Lebesgue, 8 (2025), 555-568.
 DOI: 10.5802/ahl.241. ArXiv:2303.15434 [math.GT].
- The slice-Bennequin inequality for the fractional Dehn twist coefficient.
J. Inst. Math. Jussieu, 24 (2025), no. 1, 273-289.
 DOI: 10.1017/S1474748024000276. ArXiv:2204.05288 [math.GT].
- with L. Lewark and A. Lobb. Squeezed knots.
Quantum Topol., 16 (2025), no. 4, 831-865.
 DOI: 10.4171/QT/187. ArXiv:2202.12289 [math.GT].
- with A. Sisto and G. Viaggi. Uniform models and short curves for random 3-manifolds.
Compos. Math., 161 (2025), no. 3, 447-502.
 DOI: 10.1112/S0010437X24007565. ArXiv:1910.09486 [math.GT].
- 2024 with L. Lewark and A. Lobb. On the values taken by slice torus invariants.
Math. Proc. Cambridge Philos. Soc., 176 (2024), no. 1, 55-63.
 DOI: 10.1017/S0305004123000403. ArXiv:2202.13818 [math.GT].
- with L. Lewark. Balanced algebraic unknotting, linking forms, and surfaces in three- and four-space. *J. Differential Geom.*, 127 (2024), no. 1, 213-275.
 DOI: 10.4310/jdg/1717356158. ArXiv:1905.08305 [math.GT].
- 2023 with J. Park and M. Powell. The $\mathbb{Z}$ -genus of boundary links.
Rev. Mat. Complut., 36 (2023), no. 1, 1-25.
 DOI: 10.1007/s13163-022-00424-3. ArXiv:2012.14367 [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: 10.1090/jag/793. ArXiv:2007.16164 [math.AG].
- with S. Baader and L. Ryffel. Bouquets of curves in surfaces.
Glasg. Math. J., 65 (2023), no. 1, 90-97.
 DOI: 10.1017/S001708952200012X. ArXiv:2007.10429 [math.GT].
- with M. Golla. Non-orientable slice surfaces and inscribed rectangles.
Ann. Sc. Norm. Super Pisa Cl. Sci., 24 (2023), no. 3, 1463-1485.
 DOI: 10.2422/2036-2145.202105_099. ArXiv:2003.01590 [math.GT].
- with L. Lewark and A. Lobb. Almost positive links are strongly quasipositive.
Math. Ann., 385 (2023), no. 1-2, 481-510.
 DOI: 10.1007/s00208-021-02328-x. ArXiv:1809.06692 [math.GT].
- 2022 with D. Hubbard. Examples of non-minimal open books with high fractional Dehn twist coefficient. *New York J. Math.*, 28 (2022), 917-926. 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 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].
- 2021 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.
 DOI: 10.1112/S0010437X21007508. ArXiv:2004.04204 [math.GT].
- with J. Park. Genus one cobordisms between torus knots.
Int. Math. Res. Not. 2021, no. 1, 523-550.
 DOI: 10.1093/imrn/rnaa027. ArXiv:1910.01672 [math.GT].
- 2019 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].

- 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].
- with S. Baader, L. Lewark, and R. Zentner. Khovanov width and dealternation number of positive braid links. *Math. Res. Lett.*, 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].
- 2018 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 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 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 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].
- A sharp signature bound for positive four-braids. *Q. J. Math.*, 69 (2018), no. 1, 271–283.
DOI: 10.1093/qmath/hax036. ArXiv:1508.00418 [math.GT].
- 2017 with D. Krcatovich. 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].
- 2016 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].
- 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].
- 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].
- 2015 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].
- 2014 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].

Preprints

- 2025 with L. Lewark and M. Orbegozo Rodriguez. Monodromies of surfaces in 3-manifolds, right-veeringness, and primeness of links. *ArXiv e-print*. ArXiv:2509.09615 [math.GT].

- 2024 with A. Sisto and G. Viaggi. Effective hyperbolization and length bounds for Heegaard splittings. *ArXiv e-print*. ArXiv:2408.06998 [math.GT].
with V. Brejevs. The twisting number of a ribbon knot is bounded below by its doubly slice genus. *ArXiv e-print*. ArXiv:2404.07619 [math.GT].
- 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][math.NT].
with A. Sisto and G. Viaggi. Hyperbolic Heegaard splittings and Dehn twists. *ArXiv e-print*. ArXiv:2304.05990 [math.GT].
- 2014 with I. van Santen né Stampfli. Holomorphically equivalent algebraic embeddings. *ArXiv e-print*. ArXiv:1409.7319 [math.AG][math.CV].

Book chapters and conference proceedings

- 2023 Quasimorphisms, knot invariants, and slice-Bennequin inequalities.
Oberwolfach Rep., 20 (2023), no. 1, 226–228.
DOI: 10.4171/OWR/2023/4.
- 2021 with M. Powell and A. Ray. Grope Height Raising and 1-storey Capped Towers.
The Disc Embedding Theorem, Chapter 17, 239–252, Oxford University Press, 2021.
DOI: 10.1093/oso/9780198841319.003.0017.
Recent highlights in low-dimensional topology.
Oberwolfach Rep., 18 (2021), no. 3, 2340–2342.
DOI: 10.4171/OWR/2021/42.
- 2018 with I. van Santen. Uniqueness of embeddings of the affine line into affine spaces.
Oberwolfach Rep., 15 (2018), no. 3, 1881–1882.
DOI: 10.4171/OWR/2018/31.
with A. Sisto, P. Mathieu, and S. Taylor. What does a generic 3-manifold look like?
Oberwolfach Rep., 15 (2018), no. 3, 1899–1901.
DOI: 10.4171/OWR/2018/31.

Invited talks at conferences, seminars, and colloquia

- 2025 Mathematical Colloquium, University of Bern. Geometry Seminar, ETH Zürich.
- 2024 Colloquium, University of Neuchâtel. Oberseminar Topologie, MPIM. Topology Seminar, Columbia University, New York. Geometry and Topology Seminar, Boston College.
- 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 Neuchâtel. 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.

August 2026, Neuchâtel.