

Livio Liechti

Contact information

Address Département de Mathématiques
 Université de Fribourg
 Chemin du Musée 23, 1700 Fribourg, Suisse

E-mail livio.liechti@unifr.ch

Professional experience

8/2020– Maître-Assistant, Université de Fribourg

2/2019–7/2020 Postdoctoral researcher, Université de Fribourg

10/2017–1/2019 Postdoctoral researcher, Institut de Mathématiques de Jussieu in Paris

5/2014–5/2017 Head Assistant at the Mathematical Institute, University of Bern

2/2011–9/2017 Teaching Assistant at the Mathematical Institute, University of Bern

Education

1/2014–6/2017 Ph.D. in Mathematics advised by S. Baader, University of Bern

8/2011–10/2013 M.Sc. in Mathematics, University of Bern

8/2008–7/2011 B.Sc. in Mathematics, University of Bern

9/2010–2/2011 Erasmus semester at the Universidad Autónoma de Madrid

Awards and fellowships

05/2018 Prix Schläfli 2018 in Mathematics by the Swiss Academy of Sciences

10/2017 SNSF *Early Postdoc.Mobility grant*, nr. 175260

5/2009–12/2017 Supported by the Swiss Study Foundation

Preprints

P. Dehornoy, L. Liechti: *Divide monodromies and antitwists on surfaces*
<https://arxiv.org/abs/1910.00851>

Publications

- E. Lanneau, L. Liechti: *Trace field degrees of Abelian differentials*
accepted for publication in *Comment. Math. Helv.* (2022).
- S. Baader, P. Dehornoy, L. Liechti: *Minor theory for quasipositive surfaces*
to appear in the *Festschrift for A'Campo's 80th birthday*.
- L. Liechti, J. Pankau: *The geometry of bi-Perron numbers with real or unimodular Galois conjugates*
Int. Math. Res. Not. (2022), no. 23, 18526–18540.
- R. Kellerhals, L. Liechti: *Salem numbers, spectral radii and growth rates of hyperbolic Coxeter groups*
Transform. Groups (2022), <https://doi.org/10.1007/s00031-022-09715-x>
- L. Liechti: *Divide knots of maximal genus defect*
accepted for publication in *Comm. Anal. Geom.* (2020)
- L. Liechti, J. Marché: *Overcommuting pairs in groups and 3-manifolds bounding them*
J. London Math. Soc. **102** (2020), no. 3, 1160–1177.
- L. Liechti: *On the arithmetic and the geometry of skew-reciprocal polynomials*
Proc. Amer. Math. Soc. **147** (2019), no. 12, 5131–5139.
- L. Liechti, B. Strenner: *Minimal Penner dilatations on nonorientable surfaces*
J. Topol. Anal. **13** (2021), no. 1, 187–218.
- L. Liechti, B. Strenner: *Minimal pseudo-Anosov stretch factors on nonoriented surfaces*
Algebr. Geom. Topol. **20** (2020), no. 1, 451–485.

- L. Liechti: *On the genus defect of positive braid knots*
Algebr. Geom. Topol. **20** (2020), no. 1, 403–428.
- L. Liechti, B. Strenner: *The Arnoux-Yoccoz mapping classes via Penner’s construction*
Bull. Soc. Math. France **148** (2020), no. 3, 383–397.
- S. Baader, L. Lewark, L. Liechti: *Checkerboard graph monodromies*
Enseign. Math. **64** (2018), no. 1–2, 65–88.
- R. Billet, L. Liechti: *Teichmüller polynomials of fibered alternating links*
Osaka J. Math. **56** (2019), no. 4, 787–806.
- S. Baader, P. Feller, L. Lewark, L. Liechti: *On the topological 4-genus of torus knots*
Trans. Amer. Math. Soc. **370** (2018), no. 4, 2639–2656.
- L. Liechti: *Minimal dilatation in Penner’s construction*
Proc. Amer. Math. Soc. **145** (2017), no. 9, 3941–3951.
- L. Liechti: *Positive braid knots of maximal topological 4-genus*
Math. Proc. Cambridge Philos. Soc. **161** (2016), no. 3, 559–568.
- E. Hironaka, L. Liechti: *On Coxeter mapping classes and fibered alternating links*
Michigan Math. J. **65** (2016), 799–812.
- S. Baader, P. Dehornoy, L. Liechti: *Signature and concordance of positive knots*
Bull. London Math. Soc. **50** (2018), no. 1, 166–173.
- L. Liechti: *Signature, positive Hopf plumbing and the Coxeter transformation*
with an appendix by P. Feller and L. Liechti
Osaka J. Math. **53** (2016), no. 1, 251–266.

Colloquia and conference talks (from 2017)

- 2022 *Arithmetic and orientation*, Colloquium in Neuchâtel
- 2020 *Arithmetik und Orientierung*, Colloquium at KIT
- 2019 *Overcommutation in groups and the Heegaard genus*, Knot concordance and low-dimensional manifolds in Le Croisic
The minimal spectral radius question for integer matrices, Colloquium in Fribourg
- 2018 *Minimal dilatations on nonoriented surfaces*, Teichmüller dynamics, mapping class groups and applications in Grenoble
A graph model for positive braid links, Winterbraids VIII in Luminy
- 2017 *Minimal dilatation in Penner’s construction*, Workshop on Grothendieck-Teichmüller Theories at the Chern institute of Mathematics in Tianjin

Seminar and workshop talks (from 2017)

- 2022 *Minimal spectral radii for nonnegative integer matrices*, Oberseminar Geometrie in Fribourg
Multicurve intersection degrees, Oberseminar Geometrie in Fribourg
- 2021 *Strata of translation surfaces and trace field degrees*, Quasiworld seminar (online)
- 2020 *Nombres bi-Perrons et dilatations des homéomorphismes pseudo-Anosovs*, Séminaire Géométrie Topologie Dynamique in Orsay (online)
Bi-Perron numbers and the Coxeter transformation, Oberseminar Geometrie in Fribourg
Bi-Perron numbers and the Alexander polynomial, K-OS seminar (online)
Divide knots of maximal genus defect, CIRGET Séminaire de géométrie et topologie (online)
- 2019 *Growth rates of Coxeter groups as spectral radii*, Oberseminar Geometrie in Fribourg
Surcommutation et genre de Heegaard, Séminaire de Topologie in Grenoble
The overcommutation length, SMS Doctoral Day in Bern
Overcommuting pairs in groups, Mini Swiss Knots in Bern
- 2018 *Minimal pseudo-Anosov stretch factors*, Participating Analysis seminar at UCLA

The arithmetic of orientation-reversing mapping classes, Geometry and Topology seminar at Georgia Tech

Minimal stretch factors in the extended mapping class groups, LKS-Seminar in Regensburg

Minimal pseudo-Anosov dilatations in the extended mapping class group, Geometry seminar at ETHZ

Le 4-genre topologique et caractérisations par mineurs exclus, Séminaire de Topologie in Lille

Forbidden minor characterisations and the topological 4-genus, Séminaire de Topologie at IMJ in Paris

2017 *The minimal dilatation question for surface mapping classes*, Séminaire Géométries et Topologie at IMJ in Paris

The signature function of positive knots, Topology seminar in Marseille

Teaching activities

Fall 2022 Complex Algebraic Curves, Mathematical Methods for Computer Science 1, Discrete Mathematics 1, Fribourg

Spring 2022 Low-dimensional Topology, Mathematical Methods for Computer Science 2, Discrete Mathematics 2, Fribourg

Fall 2021 Mathematical Methods for Computer Science 1, Discrete Mathematics 1, Fribourg

Spring 2021 Dynamical Systems, Mathematical Methods for Computer Science II, Discrete Mathematics II (Fribourg)

Fall 2020 Mathematical Methods for Computer Science I, Discrete Mathematics I (Fribourg)

Fall 2019 Student seminar on Complex Algebraic Curves (Fribourg)

Spring 2019 Student seminar on Surfaces (Fribourg)

2013-2017 Substitute lecturing in Linear Algebra 1, Analysis 2, Topology, Mathematics for Economists (Bern)

And as a teaching assistant in Bern:

Master: Exercise classes in Knots and 3-Manifolds, Topology. Seminar on Dynamical Systems

Bachelor: Exercise classes in Linear Algebra 1, Linear Algebra 2, Analysis 1, Analysis 2, Complex Analysis, Algebra: Groups and Fields, Differential Geometry, Mathematics for Sciences, Mathematics for Economists

Master students

Florine Pierroz (master student 2021–2022, thesis defended on 25 July 2022)

Valentin Granereau (master student 2021–2022, thesis defended on 29 September 2022)

Dylan Caballero (master student 2022–2023)

Outreach

2020 Co-organisation of a “Goûter scientifique” for children aged 8-12 in Fribourg

2019 Talk *Wo stecken die Primzahlen?* on high school day at the University of Fribourg

2017 L’HORIZON lecture *Zwischen Äther und DNA: Die mathematische Theorie der Knoten* at Gymnasium Kirchenfeld in Bern

Other activities and memberships

Referee for peer reviewed journals

Reviewer for *Zentralblatt MATH*

Member of the council of the Mathematical Department in Fribourg

Main organiser of Swiss Knots 2021

Co-organisation of the MatheFest Fribourg 2019

Co-organisation of the 15th Graduate Colloquium of the Swiss Doctoral Program in Mathematics

Co-organisation of a reading seminar on Teichmüller theory, Bern and Fribourg, Fall 2021

Member of the *Swiss Mathematical Society*

Member of *Suivi*, the alumni organisation of the Swiss Study Foundation

December 2022