

Arnaud Maret

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Curriculum vitæ

September 5, 2023

Employment

- **Sorbonne Université**, Nov 2022 - present
FSMP Postdoctoral researcher at the Institut de Mathématiques de Jussieu,
Mentor: Prof. Julien Marché.

Education

- PhD in Mathematics (cum laude), **Universität Heidelberg**, Sep 2018 - Jul 2022
Thesis title: *The symplectic geometry of surface group representations in genus zero*,
Mentors: Prof. Peter Albers & Prof. Anna Wienhard.
- MSc in Mathematics (with distinction), **ETH Zürich**, Sep 2016 - Jun 2018
Thesis title: *Forcing relations for periodic orbits of surface homeomorphisms*,
Mentor: Prof. Will J. Merry.
- Exchange program, **University of Waterloo**, Sep 2015 - Jun 2016
- BSc in Mathematics, **EPFL Lausanne**, Sep 2013 - Jun 2016
Thesis title: *The Hardy-Littlewood Circle Method and the Waring Problem*,
Mentor: Prof. Yu-Ru Liu (University of Waterloo, Canada).

Research interest

Representations of surface groups, (higher) Teichmüller Theory, symplectic geometry, (complex) hyperbolic geometry, and dynamics on character varieties.

Papers and preprint

3. *Proceedings of the Young Researchers Workshop on Positivity in Lie Groups* with X. Flamm, 2022. Submitted. arXiv:2212.04339.
2. *Action-angle coordinates for surface group representations in genus zero*. Submitted, 32 pages. arXiv:2110.13896.
1. *Ergodicity of the mapping class group action on Deroin-Tholozan representations*. Groups Geom. Dyn. 16 (2022), 1341–1368.

Invited research stays

- **University of Maryland,** Sep 2022 - Oct 2022
Visiting Prof. William M. Goldman,
Funding awarded by SFB/TR 191 “Symplectic structures in Geometry, Algebra and Dynamics”.
- **Sorbonne Université,** Sep 2021 - Dec 2021
Visiting Prof. Julien Marché,
Funding awarded by RTG 2229 “Asymptotic Invariants and Limits of Groups and Spaces”.
- **Mathematical Sciences Research Institute (MSRI),** Aug 2019
Semester program on *Holomorphic Differentials in Mathematics and Physics*,
Funding awarded by MSRI.

Teaching

- **RTG Lecture** Character varieties – A symplectic perspective, Spring 2022
KIT Karlsruhe/Universität Heidelberg.
- Blockseminar Hyperbolische Geometrie, Universität Heidelberg. Spring 2020
- Proseminar Differentialgeometrie, Universität Heidelberg. Fall 2018
- **401-0614-00L** Probability and Statistics (TA), ETH Zürich. Spring 2018
- **MATH-106** Analyse 2 (TA), EPFL Lausanne. Spring 2015
- **MATH-101** Analyse 1 (TA), EPFL Lausanne. Fall 2014

Invited talks

12. **Workshop on metrics on higher Teichmüller spaces, Fréjus.** Aug 2023
Shear coordinates for the Weil-Petersson symplectic form.
11. **Tuesday Seminar on Topology, University of Tokyo.** Jul 2023
Moduli spaces of triangle chains.
10. **Symplectix, Institut Henri Poincaré.** Apr 2023
Action-angle coordinates for character varieties à la Kapovich–Millson.
9. **Séminaire Géométrie et Topologie, IMJ-PRG, Sorbonne Université.** Feb 2023
Representations of surface groups away from Teichmüller space.
8. **Geometry and Topology Seminar, University of Iowa.** Jan 2023
The two natures of connected components of character varieties.

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| 7. Geometry-Topology Seminar, University of Maryland.
<i>Compact spaces of surface group representations in genus zero.</i> | Sep 2022 |
| 6. Geometry Graduate Colloquium, ETH Zürich.
<i>Character varieties, mapping class group action and ergodicity.</i> | Oct 2021 |
| 5. Geometry Seminar, ETH Zürich.
<i>Remarkable surface group representations in genus zero.</i> | Oct 2021 |
| 4. Geometry and Topology Seminar, University of Bristol.
<i>Remarkable surface group representations in genus zero.</i> | Oct 2021 |
| 3. Hauptseminar Symplektische Geometrie, Universität Heidelberg.
<i>Forcing relations for periodic orbits of surface homeomorphisms.</i> | Jun 2018 |
| 2. Symplectic Geometry Seminar, JLU Giessen.
<i>Forcing relations for periodic orbits of surface homeomorphisms.</i> | Mar 2018 |
| 1. Oberseminar Dynamische Systeme, Ruhr-Universität Bochum.
<i>Forcing relations for periodic orbits of surface homeomorphisms.</i> | Mar 2018 |

Presentations

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| 6. Ventotene International Workshops: Counting problems,
<i>Lightening talk on Derooin-Tholozan representations.</i> | Sep 2021 |
| 5. CMI-HIMR Dynamics and Geometry Online Summer School, University of Bristol,
<i>Lightening talk on character varieties and mapping class group action.</i> | Jun 2021 |
| 4. Reading Seminar on Anosov representations, University of Virginia,
<i>Characterization of Anosov representations in terms of singular and eigenvalues.</i> | Apr 2021 |
| 3. RTG Seminar on Topological K-Theory, KIT Karlsruhe,
<i>K-Theory and stable homotopy groups of spheres.</i> | Oct 2020 |
| 2. Seminar Topological methods in data analysis, Universität Heidelberg,
<i>Differential calculus on persistence barcodes.</i> | Nov 2019 |
| 1. RTG Seminar on Rational Homotopy Theory, KIT Karlsruhe,
<i>Formality of Kähler manifolds.</i> | Mar 2019 |

Mentoring and Outreach

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| • Mathematical Olympiad,
Training of Olympiad coaches in East Africa,
<i>Organizer: Paul Vaderlind.</i> | Fall 2023 |
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- **Heidelberg Experimental Geometry Lab,** Spring 2022
Project: Modelization of triangle chains in the hyperbolic plane,
Mentee: Frederik Kolb.

Organizing

- **Interplay between symplectic geometry and cluster theory,** Spring 2023
 IWH Heidelberg,
Co-organizers: Maria Bertozzi, Alexandre Jannaud.
- **Workshop on Positivity in Lie Groups,** Spring 2022
 IWH Heidelberg,
Co-organizer: Xenia Flamm.
- **RTG Seminar on Dynamics in one complex variable,** Fall 2021
 KIT Karlsruhe/Universität Heidelberg
- **Reading seminar on infinite dimensional symplectic reduction,** Spring 2021
 Universität Heidelberg.
- **Reading seminar on Bridgeland's stability conditions for meromorphic differentials,** Fall 2020
 Universität Heidelberg,
Co-organizer: Beatrice Pozzetti.
- **RTG Seminar on Topological K-Theory,** Spring 2020
 KIT Karlsruhe/Universität Heidelberg.
- **Reading seminar on Dynamics of Teichmüller space,** Spring 2019
 Universität Heidelberg,
Co-organizers: Peter Albers, Anna Wienhard.
- **RTG Seminar on Rational Homotopy Theory,** Spring 2019
 KIT Karlsruhe/Universität Heidelberg,
Co-organizers: Urs Fuchs, Anna-Maria Vocke.

Conferences and workshops attended

- (Aug 2023) Summer workshop on Metrics on higher Teichmüller spaces, Fréjus, France.
- (Aug 2023) Workshop on Teichmüller Theory: Classical, Higher, Super and Quantum, Oberwolfach, Germany.
- (Feb 2023) Summer school on Topics on the Geometry of Locally Symmetric Spaces, Montevideo, Uruguay.
- (Jan 2023) Workshop on Interplay between symplectic geometry and cluster theory, IWH Heidelberg.

- (Jul 2022) Marc Burger's Prime, Zürich, Switzerland.
- (Jun 2022) Groups, Geometry and Dynamics, A conference in honor of François Labourie, Cargèse, France.
- (Mai 2022) Weak KAM theory - XXV years later, Avignon, France.
- (Jan 2022) Workshop on Positivity in Lie Groups, IWH Heidelberg.
- (Nov 2021) Young researchers meeting of the GDR Platon, CIRM Marseille.
- (Sep 2021) Ventotene International Workshops: Counting problems, Ventotene, Italy.
- (Aug 2021) Workshop on Anosov representations, Aussois, France.
- (Jun 2021) CMI-HIMR Dynamics and Geometry Online Summer School (online), University of Bristol.
- (Jan 2021) Topics at the Interface of Low Dimensional Group Actions and Geometric Structures (online), National University of Singapore.
- (Nov 2020) 15th International Young Researchers Workshop on Geometry, Mechanics and Control (online), Universiteit Utrecht.
- (Oct 2020) Symposium: Mathematics in Sciences, Engineering and Economics (online), KIT Karlsruhe.
- (Oct 2020) Teichmüller Theory: Classical, Higher, Super and Quantum (online), CIRM Marseille.
- (Jun 2020) Nearly Carbon Neutral Geometric Topology Conference (online).
- (Feb 2020) Winter School on Invariant Function Theorems, JLU Giessen.
- (Feb 2020) CAST 2020: XIV Workshop on Symplectic Geometry, Contact Geometry, and Interactions, Universiteit Antwerpen.
- (Nov 2019) Geometric Dynamics Days, RWTH Aachen University.
- (Aug 2019) Workshop on bounded cohomology, Universität Heidelberg.
- (May 2019) Workshop on Geometry, Topology and Computation, Universität Heidelberg.
- (Apr 2019) Graduate school on Geometry of Teichmüller spaces, Simons Center, Stony Brook University, NY.
- (Mar 2019) CAST 2019: XIII Workshop on Symplectic Geometry, Contact Geometry, and Interactions, Humboldt University, Berlin.
- (Mar 2019) Symposium: Geometry, Topology, Analysis and Dynamical systems, Universität Heidelberg.

- (Feb 2019) Geometric Analysis meets Geometric Topology, Universität Heidelberg.
- (Nov 2018) Geometric Dynamics Days, JLU Giessen.
- (Nov 2018) Workshop on Computational Topology and Topological Data Analysis, Heidelberg Institute for Theoretical Studies.
- (Aug 2018) Summer School on Equivariant Symplectic Homology, JLU Giessen.

Mathematical Olympiad activities

- Board member of the Swiss Science Olympiad, Jun 2022-present.
- Academic director of the Swiss Mathematical Olympiad, Dec 2017-Dec 2022.
- Team leader for Switzerland at the International Mathematical Olympiad (IMO), 2016-2018 and 2020.
- Member of the problem selection committee at the IMO 2022 and 2023.

Languages

- French (mother tongue)
- English (fluent)
- German (fluent)