

Arnaud Maret

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Curriculum vitæ

November 25, 2024

Employment

- **Université de Strasbourg**, Nov 2024 - present
Postdoctoral researcher at the Institut de Recherche Mathématique Avancée,
Mentor: Prof. Nalini Anantharaman.
- **Sorbonne Université**, Nov 2022 - Oct 2024
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 and character varieties, (higher) Teichmüller Theory, symplectic geometry, (complex) hyperbolic geometry, and dynamics on character varieties.

Papers and preprints

5. *Mapping class group orbit closures for Derooin-Tholozan representations*
with Y. Bouilly and G. Faraco. [arXiv:2411.10269 \[math.DS\]](#), 2024. (39 pages)
4. *Tykhyy's Conjecture on finite mapping class group orbits*
with S. Bronstein. [arXiv:2409.04379 \[math.DS\]](#), 2024. (70 pages)
3. *The geometry of Derooin-Tholozan representations*
with A. Fenyes. [arXiv:2312.09199 \[math.GT\]](#), 2023. (33 pages)
2. *Action-angle coordinates for surface group representations in genus zero*
J. Symplectic Geom. **22** (2024). [arXiv:2110.13896 \[math.GT\]](#). (38 pages)
1. *Ergodicity of the mapping class group action on Derooin-Tholozan representations*
Groups Geom. Dyn. **16** (2022). [arXiv:2012.05775 \[math.DS\]](#). (22 pages)

Editorial work

1. *Proceedings of the Young Researchers Workshop on Positivity in Lie Groups*
with X. Flamm. [arXiv:2212.04339 \[math.DG\]](#), 2022.

Research stays

- **Seoul National University**, May 2024
Visiting Prof. Gye-Seon Lee.
- **Gakushuin University, Tokyo**, Jul 2023
Visiting Prof. Ken'ichi Ohshika.
- **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

- **BSc lecture** Multiple, line, and surface integrals Spring 2025
Université de Strasbourg, 6h/week, 80+ attendees.
- **Elective course** Character varieties with a symplectic perspective Spring 2022
KIT Karlsruhe/Universität Heidelberg, 6h total, 20+ attendees.
- **Student seminar** Hyperbolic geometry Spring 2020
Universität Heidelberg, 2h/week, 14 attendees.
- **Student seminar** Differential geometry Fall 2018
Universität Heidelberg, 2h/week, 14 attendees.
- **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

20. **Séminaire de géométrie et dynamique, Cergy-Pontoise.** Jan 2025
TBD
19. **Séminaire de Théorie ergodique, Université de Rennes.** Dec 2024
Tykhyy's conjecture on finite mapping class group orbits on character varieties
18. **Geometry Seminar, MPI Leipzig.** Oct 2024
Finite mapping class group orbits on character varieties.
17. **Séminaire Géométrie, Algèbre, Dynamique et Topologie, Université de Bourgogne.** Sep 2024
Finite orbits on character varieties.
16. **Séminaire Géométrie et applications, Université de Strasbourg.** Mar 2024
Discrete totally elliptic surface group representations.
15. **Symplectic Zoominar, IAS Princeton (online).** Dec 2023
Complex projective spaces and surface group representations.
14. **Séminaire de théorie spectrale et géométrie, Institut Fourier.** Nov 2023
Totally elliptic surface group representations.
13. **Séminaire de Géométrie, Université Claude Bernard Lyon 1.** Oct 2023
Complex projective spaces and surface group representations.
12. **Workshop on metrics on higher Teichmüller spaces, Fréjus.** Aug 2023
Shear coordinates for the Weil-Petersson symplectic form.

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| 11. Tuesday Seminar on Topology, University of Tokyo.
<i>Moduli spaces of triangle chains.</i> | Jul 2023 |
| 10. Symplectix, Institut Henri Poincaré.
<i>Action-angle coordinates for character varieties à la Kapovich–Millson.</i> | Apr 2023 |
| 9. Séminaire Géométrie et Topologie, Sorbonne Université.
<i>Representations of surface groups away from Teichmüller space.</i> | Feb 2023 |
| 8. Geometry and Topology Seminar, University of Iowa.
<i>The two natures of connected components of character varieties.</i> | Jan 2023 |
| 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 Symplectische 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 |

Short presentations

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| 2. Ventotene International Workshops: Counting problems,
<i>Lightening talk on Deroin-Tholozan representations.</i> | Sep 2021 |
| 1. 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 |

Mentoring and Outreach

- **Mathematical Olympiad,** Fall 2023 - present
Training of Math Olympiad coaches in Bhutan and in Africa,
Co-organizer: Paul Vaderlind.

- **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 dif-**
ferentials, 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

- (Oct 2024) Conference “20 years of Anosov representations”, Leipzig, Germany.
- (Aug 2024) Workshop on Components of character varieties, Aussois, France.
- (Apr 2024) Workshop on Submanifolds of locally symmetric spaces: geometric, analytic and dynamical aspects, Autrans, France.
- (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-Jun 2024.
- 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, 2023, and 2025.

Languages

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