Guillaume Tahar

Contact Information

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Research Interests

- Geometry and Dynamics on surfaces
- Moduli spaces of differential forms on Riemann surfaces

Academic positions

Beijing Institute of Mathematical Sciences and Applications, China
- Assistant Professor — 2022-present

Weizmann Institute of Science, Rehovot, Israel
- Senior Research Fellow — 2021-2022
- Research Fellow — 2019-2020

Education

Université Paris Diderot, France

Ph.D., Mathematics — 2013-2017
- Thesis Title: *Saddle Connections of Flat Surfaces with Poles*
- Advisor: Prof. Anton Zorich

M.S., Mathematics — 2012-2013
- Dissertation Title: *Rigidity in translation surfaces*
- Advisor: Prof. Anton Zorich

Ecole Normale Supérieure Paris-Saclay, France

Normalien, agrégé in Mathematics — 2011-2012

Sorbonne Université, Paris, France

Licence, Mathematics — June 2010

Refereed Journal Publications

1. **Tahar, G.** "Counting saddle connections in flat surfaces with poles." *Geometriae Dedicata*, Vol 196, Issue 1, pp 145-186, 2018.
2. **Tahar, G.** "Chamber structure of modular curves $X_1(N)$." *Arnold Mathematical Journal*, Vol 4, Issue 3-4, pp 459-481, 2018.
3. **Tahar, G.** "Geometric Triangulations and Flips." *Comptes Rendus de l'Académie des sciences*, Vol 357, Issue 7, pp 620-623, 2019.
4. **Tahar, G.** "Veech groups of flat surfaces with poles." *Annales de la Faculté des Sciences de Toulouse*, Vol 29, Issue 1, pp 57-78, 2020.
5. **Tahar, G.** "Horizon saddle connections, quasi-Hopf surfaces and Veech groups of dilation surfaces." *Geometriae Dedicata*, Vol 212, Issue 1, pp 1-16, 2021.
6. **Tahar, G.** "A topological bound on the Cantor-Bendixson rank of meromorphic differentials." *Arnold Mathematical Journal*, Vol 7, Issue 2, pp 213-223, 2021.
7. Gendron, Q., **Tahar, G.** "Abelian differentials with prescribed singularities." *Journal de l'Ecole Polytechnique*, Vol 8, pp 1397-1428, 2021.
8. Shapiro, B., **Tahar, G.** "On existence of quasi-Strebel structures for meromorphic k-differentials." *L'Enseignement Mathématique*, Vol 67, Issue 2, pp 187-207, 2021.

9. **Tahar, G.** "Geometric decompositions of surfaces with spherical metric and conical singularities." *Quarterly Journal of Mathematics*, Vol 73, Issue 2, pp 657-678, 2021.
10. Gendron, Q., **Tahar, G.** "Isoresidual fibration and resonance arrangements." *Letters in Mathematical Physics*, Vol 112, 33, 2022.
11. Novikov, D., Shapiro, B., **Tahar, G.** "On limit sets for geodesics of meromorphic connections." *Journal of Dynamical and Control Systems*, Vol 29, pp 55-70, 2023.
12. **Tahar, G.** "Horizon saddle connections and Morse-Smale dynamics of dilation surfaces." *Journal of Modern Dynamics*, Vol 19, pp 417-431, 2023.
13. Gendron, Q., **Tahar, G.** "Dihedral monodromy of cone spherical metrics." *Illinois Journal of Mathematics*, Vol 67, Issue 3, pp 457-483, 2023.
14. Alexandersson, P., Hemingsson, N., Novikov D., Shapiro, B., **Tahar, G.** "Linear first order differential operators and their Hutchinson invariant sets." *Journal of Differential Equations*, Vol 391, pp 265-320, 2024.
15. Gendron, Q., **Tahar, G.** "Quadratic differentials with prescribed singularities." *Canadian Journal of Mathematics*, to appear.
16. Boulanger, A., Ghazouani S., **Tahar, G.** "Closed geodesics in dilation surfaces." *Geometry & Topology*, to appear.

Submitted Journal Publications

1. Gendron, Q., **Tahar, G.** "k-differentials with prescribed singularities."
2. Chéritat, A., **Tahar, G.** "Similarity surfaces, connections and the measurable Riemann mapping theorem."
3. Chéritat, A., **Tahar, G.** "Stiff connections in pseudo-Euclidean manifolds."
4. Faraco, G., **Tahar, G.**, Zhang, Y. "Isoperiodic foliation of the stratum $\mathcal{H}(1,1,-2)$."
5. Fu, K., **Tahar, G.** "Bounds on saddle connections for flat spheres."
6. Lee, M., **Tahar, G.** "One-dimensional strata of residueless meromorphic differentials."
7. Kohli, B. M., **Tahar, G.** "A lower bound for the genus of a knot using the Links-Gould invariant."
8. Alexandersson, P., Hemingsson, N., Novikov D., Shapiro, B., **Tahar, G.** "On boundary points of minimal continuously Hutchinson invariant sets."

Papers in Preparation

1. Kohli, B. M., Shapiro, B., **Tahar, G.**, "Combinatorics of point configurations in the complex projective line."
2. Bøgvad, R., Shapiro, B., **Tahar, G.**, Warakkagun, S. "The translation geometry of Pólya's shires."
3. Faraco, G., **Tahar, G.** "On integral holonomy representations of quadratic differentials."
4. Chen, D., Gendron, Q., Prado Godoy, M., **Tahar, G.** "On the topology of isoresidual fibers."
5. Panov, D., **Tahar, G.** "On simplicial arrangements with few double points."
6. **Tahar, G.** "Dichotomy in the counting of saddle connections of meromorphic differentials."

Other preprints

1. **Tahar, G.** "Algebraic ordered structures and classification of semifields.", 2017.

Miscellaneous

1. Lerner, F., **Tahar, G.**, Bar, A., Koren O., Flash, T. "VR setup to assess peripersonal space audio-tactile 3D boundaries." *Frontiers in Virtual Reality*, Volume 2, 2021.

Presentations

- Member Seminar, BIMSA — April 2024
- Modern Dynamics Seminar, Tsinghua University, Beijing — March 2024
- Geometry and Dynamics Seminar, BIMSA — March 2024
- Minicourse on spherical metrics, USTC, Hefei — August 2023
- Affine surfaces and germs (workshop), University of Toulouse — July 2023
- Seminar in Differential Geometry, BIMSA / BIT — May 2023
- Seminar in Topology, Yau Mathematical Sciences Center, Beijing — May 2023
- Algebraic Geometry Seminar, Tsinghua University, Beijing — January 2023
- Modern Dynamics Seminar, Tsinghua University, Beijing — December 2022
- Spherical surfaces and related topics (workshop), INdAM, Cortona — June 2022
- KCL Geometry Seminar, King's College, London — June 2022
- Groups and Dynamics Seminar, Tel Aviv University — March 2022
- Complex Analysis and Differential Equations Seminar, University of Lille — Feb 2022
- Geometry and Topology Seminar, Indian Institute of Science, Bangalore — Feb 2022
- Seminar in Geometry and Topology, Weizmann Institute, Rehovot — Dec 2021
- Seminar in Geometry and Topology, Technion, Haifa — June 2021
- Seminar in Algebraic Geometry, Ben-Gurion University — December 2020
- Seminar in Real and Complex Geometry, Tel Aviv University — March 2020
- Seminar in Algebra and Geometry, Stockholm University — February 2020
- Seminar in Dynamical Systems, University of Toulouse — February 2020
- Seminar in Geometry and Topology of Weizmann Institute, Rehovot — Oct 2019
- Seminar in Geometry and Topology of Weizmann Institute, Rehovot — March 2019
- Seminar in Geometry and Dynamics in Moduli spaces, IHP, Paris — Oct 2016
- Seminar in Geometry, University of Toulouse — May 2016
- Doctoral seminar, University of Dijon — Nov 2013

Teaching Experience

- Classical constructions in geometric topology - Graduate Course in BIMSA — 2023-2024
- Introduction to geometry of surfaces - Graduate Course in BIMSA — 2023-2024
- Geometric structures - Graduate Course in BIMSA — 2022-2023
- Riemann surfaces - Master Course in Weizmann Institute of Science — 2021-2022
- Undergraduate Analysis and Algebra - Teaching Assistant in Université Paris Diderot) — 2013-2016

Awards and Grants

- Participant to TIGerS: Tangent to the Identity Germs and affine Surfaces (Agence Nationale de la Recherche - 374 321 euros grant) — 2024-2027
- China Foreign Talent Program — 2024
- Beijing Natural Science Foundation - International Scientists Grant — 2023
- Senior postdoctoral fellowship in Weizmann Institute of Science (supervised by Prof. Dmitry Novikov) — 2021-2022

Language skills

- French: Native Speaker
- English: Professional
- Spanish: Basic skills
- German: Beginner
- Hebrew: Beginner