

Tommaso Scognamiglio

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Research interests

My research interests revolve around the interactions between representation theory, combinatorics and the computation of the cohomology of moduli spaces such as, for instance, quiver varieties, character varieties and moduli spaces of Higgs bundles.

Key words

Quiver representations, quiver varieties, representations of finite reductive groups, character varieties for Riemann surfaces, moduli spaces of Higgs bundles, non-abelian Hodge theory

Education

- June 2025-2026 **Postdoc**, *Research fellow IndAm, hosted by University of Bologna*, working with Luca Migliorini
- October 2024-May 2025 **Postdoc**, *University of Heidelberg*, working with Florent Schaffhauser
- 2020-2024 **PhD in Mathematics**, *Université Paris Cité-IMJ PRG*, under the supervision of Emmanuel Letellier
- 2017–2019 **Master in Mathematics**, *Università di Pisa- Scuola Normale Superiore, Pisa, Italy.*
- 2015-2017 **Bachelor in Mathematics**, *Università di Pisa- Scuola Normale Superiore, Pisa, Italy.*

Preprints and publications

- 2022 **T. Scognamiglio**, *On the cohomology of character stacks for non-orientable surfaces*, *Geometriae Dedicata*, **218**, 13 (2024) .
- 2023 **T. Scognamiglio**, *A generalization of Kac polynomials and tensor product of representation of $GL_n(\mathbb{F}_q)$* , *Transformation groups*, (2024.)
- 2024 **T. Scognamiglio**, *Cohomology of non-generic character stacks*, *Journal de l'École Polytechnique*, **11**, (2024).
- 2024 **E. Letellier and T. Scognamiglio**, *$PGL_n(\mathbb{C})$ -character stacks and Langlands duality over finite fields*, arXiv :2412/03234, submitted.
- 2025 **F. Schaffhauser and T. Scognamiglio**, *Real Bialynicki-Birula flows in moduli spaces of Higgs bundles*, arxiv :2507.18613, submitted.

Talks

- 11/2021 **Lie Theory seminar**, *Università di Pisa*, Proof of the Kac's conjecture
- 02/2023 **Geometry Seminar**, *Università di Firenze*, Character varieties for non-orientable surfaces.

- 04/2023 **Differential Geometry Seminar**, *Heidelberg University*, Character varieties for non-orientable surfaces.
- 01/2024 **Algebra and Geometry seminar**, *University of Bologna*, Character stacks and varieties for Riemann surfaces.
- 01/2024 **Groups, Representations and Geometry seminar**, *IMJ-PRG*, Character stacks and varieties for Riemann surfaces.
- 01/2024 **PhD preprint seminar**, *Université Paris Cité*, Representations of quivers and finite general linear groups.
- 05/2024 **Algebraic Geometry seminar**, *EPFL*, Character stacks and varieties for punctured Riemann surfaces.
- 05/2024 **Algebra and Geometry seminar**, *ICMAT*, Character stacks and varieties for punctured Riemann surfaces.
- 07/2024 **Algebra seminar**, *Kaiserlautern University*, Multiplicities for tensor product of representations of $\mathrm{GL}_n(\mathbb{F}_q)$.
- 11/2024 **Conference "Algebraic geometry and complex geometry"**, *CIRM*, Character stacks and varieties for Riemann surfaces.
- 01/2025 **Combinatorics, Lie theory and topology**, *University of Pisa*, PGL_2 -character varieties and Langlands duality over finite fields
- 01/2025 **Algebraic geometry and number theory seminar**, *ISTA*, PGL_2 -Character varieties and Langlands duality over finite fields
- 02/2025 **Group, Representation and Geometry seminar**, *Université Paris Cité*, PGL_2 -Character stacks and Langlands duality over finite fields
- 03/2025 **Conference "Colloquium of French algebra researchers"**, *Clermont Ferrand University*, Multiplicities for tensor product of representations of $\mathrm{GL}_n(\mathbb{F}_q)$ and quiver representations.
- 04/2025 **Algebra and representation theory seminar**, *University of Roma, Tor Vergata*, PGL_2 -character varieties and Langlands duality over finite fields
- Spring 2025 **Local systems on Riemann surfaces and character varieties**, Cycle of five lectures at the RTG Geometry seminar, Heidelberg University.
- 05/2025 **Conference "Stratifications of Higgs bundle moduli spaces and related topics"**, *Santiago de Compostela University*, Non-generic character varieties for Riemann surfaces, 20min talk.
- 06/2025 **Algebra and geometry seminar**, *University of Bologna*, Character varieties for Riemann surfaces and representations of finite reductive groups
- 09/2025 **Local systems on Riemann surfaces, character varieties and vector bundles**, Mini-course, Bogotà, Universidad Los Andes
- 10/25 **Conference "CARE"**, *Lyon University*, Multiplicities for finite reductive groups, quiver representations and quiver moduli, 45 min talk.
- 11/2025 **Conference "Darstellungstheoretage – Representation Theory Days 2025"**, *Düsseldorf University*, Multiplicities for finite reductive groups and character varieties for Riemann surfaces, 30 min talk.
- 12/2025 **One-day workshop "Enumerative geometry and geometric representation theory"**, *University of Pisa*, Cohomology of singular moduli spaces in the non-abelian Hodge theory of a curve, 30 min talk.

- 02/2026 **Conference "Indo-European Conference in Mathematics"**, *Pune University*, 30 min talk in the Symposium of Differential and Complex Geometry, Moduli spaces of Higgs bundles and antiholomorphic involutions.
- 03/2026 **Groups, Algebra and topology seminar**, *Amiens University*, Character varieties for Riemann surfaces and representations of finite reductive groups

Research visits

- 04/2023 **Heidelberg University**, Invited by Florent Schaffhauser.
- 02/2025 **Université Paris Cité**, Invited by Emmanuel Letellier
- 05/2025 **Université Paris Cité**, Invited by Emmanuel Letellier.
- 06/2025 **University of Heidelberg**, Invited by Florent Schaffhauser.

Teaching experience

- 2025-2026 **Linear Algebra tutor**, for first year students in Mathematics, University of Bologna.
- 2023-2024 **Groups and Arithmetics**, for second year students in Informatics, Université Paris Cité.
- 2023-2024 **Elementary analysis and algebra**, for first year students in Physics, Université Paris Cité.
- 2023-2024 **Algebra**, for third year students in Mathematics, Université Paris Cité.
- 2023-2024 **Analysis**, for second year students in Mathematics, Université Paris Cité.
- 2022-2023 **Analysis**, for second year students in Mathematics, Université Paris Cité.
- 2021-2022 **Analysis**, for third year students in Engineering, Université Paris Cité.