

Joseph MULLER

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Born: August 12, 1996—Strasbourg, France.
Nationality: French.

Current position

JSPS fellow, standard postdoctoral program.

Under the supervision of Naoki Imai (the University of Tokyo).

Areas of interest

Number theory, arithmetic geometry, cohomology of Shimura varieties.

Education

- 2023 PhD in Mathematics, Université Sorbonne Paris Nord, France. Under the supervision of Pascal Boyer and Naoki Imai.
- 2020 Master Degree in Mathematics, ENS Lyon, France.
- 2020 Exchange student in the Graduate School of Mathematical Sciences, University of Tokyo.
- 2019 Higher education teacher training in mathematics (Agrégation de mathématiques). Passed, rank 8.
- 2017 Bachelor Degree, ENS Lyon, France.

Publications & talks

PUBLISHED PAPERS

- 2023 J. Muller: “Cohomology of the Bruhat-Tits strata in the unramified unitary Rapoport-Zink space of signature $(1, n-1)$ ”, Nagoya Math. J. **250** 470–497 [doi:10.1017/nmj.2022.39](https://doi.org/10.1017/nmj.2022.39).

PREPRINTS

- 2025 J. Muller. “Nearby cycles on the local model for the $\mathrm{GU}(n-1, 1)$ PEL Shimura variety over a ramified prime”. [arXiv:2502.17851](https://arxiv.org/abs/2502.17851), submitted.
- 2024 J. Muller. “Cohomology of the Bruhat-Tits strata in the supersingular locus of the $\mathrm{GU}(1, n-1)$ Shimura variety at a ramified prime”. [arXiv:2407.14012](https://arxiv.org/abs/2407.14012), submitted.

- 2022 J. Muller. “Cohomology of the basic unramified PEL unitary Rapoport-Zink space of signature $(1, n-1)$ ”. [arXiv:2201.10229](https://arxiv.org/abs/2201.10229), submitted.

TALKS

- 2025 The nearby cycles of the PEL $GU(n-1, 1)$ Shimura variety over a ramified prime.
Waseda University Number Theory Symposium 2025, Tokyo.
- 2025 The nearby cycles of the PEL $GU(n-1, 1)$ Shimura variety over a ramified prime.
Aichi Number Theory Seminar (ANTS), Nagoya.
- 2024 Cohomology of supersingular loci of Shimura varieties of Coxeter type.
One day workshop on Shimura varieties and related moduli stacks, Kyoto.
- 2023 Cohomology of the supersingular locus of certain PEL Shimura varieties of Coxeter type.
NTU x UTokyo joint conference 2023, Number Theory Session, Taipei.
- 2022 On the cohomology of the unramified PEL unitary Rapoport-Zink space of signature $(1, n-1)$.
RIMS Conference, Algebraic Number Theory and Related Topics 2022, Kyoto.
- 2022 On the cohomology of the unramified PEL unitary Rapoport-Zink space of signature $(1, n-1)$.
MS Seminar, Kavli IPMU, the University of Tokyo.
- 2022 On the cohomology of the unramified PEL unitary Rapoport-Zink space of signature $(1, n-1)$.
Number theory seminar, Department of Mathematics, Kyoto University.
- 2022 On the cohomology of the unramified PEL unitary Rapoport-Zink space of signature $(1, n-1)$.
21st Sendai-Hiroshima Number Theory Workshop, Tohoku University.
- 2022 Cohomology of the unramified PEL unitary Rapoport-Zink space of signature $(1, n-1)$.
Number theory seminar, Graduate School of Mathematical Sciences, the University of Tokyo.
- 2021 Cohomologie des espaces de Rapoport-Zink PEL unitaires non ramifiés de signature $(1, n-1)$ en niveau maximal.
Séminaire de Géométrie Arithmétique et Motivative, Institut Galilée, Université Sorbonne Paris Nord.

Teaching

- 2022 Teaching assistant for the lectures Analyse 1, Algèbre 1 et 6, Intégration et Probabilités, Université Sorbonne Paris Nord.
- 2021 Teaching assistant for the lectures Analyse 1, Algèbre 1, Outils Mathématiques 1, Université Sorbonne Paris Nord.
- 2020 Teaching assistant for the lectures Analyse 3, Algèbre 3, Mathématiques for the Economics and Business Science department, Université Sorbonne Paris Nord.

Miscellaneous

- 2018 Informal talk on Ramsey theory for undergraduate students as part of an event to promote the diffusion of mathematics, in Lycée du Parc, Lyon.

Last updated: February 27, 2025