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Research

Mathematics ; Algebraic geometry, Number theory, Representation theory.

Employment

- 2023–26 *Akademischer Rat auf Zeit*, Universität Münster.
- 2022–23 *Wissenschaftlicher Mitarbeiter*, Universität Münster.
- 2022 *Gast*, Max-Planck-Institut für Mathematik, Bonn.
- 2020–21 *Research associate*, Imperial College London.
- 2017–20 *Wissenschaftlicher Mitarbeiter*, Rheinische Friedrich-Wilhelms-Universität Bonn.

Education

- 2020 PhD in Mathematics, Rheinische Friedrich-Wilhelms-Universität Bonn.
- 2017 MSc in Mathematics, Rheinische Friedrich-Wilhelms-Universität Bonn.
- 2015 BSc in Mathematics, Faculdade de Ciências da Universidade do Porto.

Papers

- 2024 13. “A modular ramified Satake equivalence”, with P. Achar, T. Richarz, and S. Riche, [arXiv:2403.10651](#).
- 2023 12. “Distributions and normality theorems”, [arXiv:2312.17121](#).
- 2023 11. “Gaitsgory’s central functor and the Arkhipov–Bezrukavnikov equivalence in mixed characteristic”, with J. Anschütz, Z. Wu, and J. Yu, [arXiv:2311.04043](#).
- 2022 10. “Fixed points under pinning-preserving automorphisms of reductive group schemes”, with P. Achar, T. Richarz, and S. Riche, [arXiv:2212.10182](#).
- 2022 9. “On the connectedness of p-adic period domains”, with I. Gleason, [arXiv:2210.08625](#), submitted.
- 2022 8. “Singularities of local models”, with N. Fakhruddin, T. Haines, and T. Richarz, [arXiv:2208.12072](#), submitted.
- 2022 7. “Tubular neighborhoods of local models”, with I. Gleason, [arXiv:2204.05526](#), to appear in *Duke Mathematical Journal*.

- 2022 6. “On the p-adic theory of local models”, with J. Anschütz, I. Gleason, and T. Richarz, [arXiv:2201.01234](#), submitted.
- 2020 5. “On the normality of Schubert varieties: remaining cases in positive characteristic”, with T. Haines and T. Richarz, [arXiv:1806.11001](#), to appear in *Annales Scientifiques de l’École Normale Supérieure*.
- 2020 4. “Théorie de Bruhat–Tits, grassmanniennes affines et modèles locaux”, Dissertation. *Landesbibliothek Uni Bonn*, [bonndoc](#).
- 2020 3. “Théorie de Bruhat–Tits pour les groupes quasi-réductifs”, [arXiv:2001.05362](#), *Journal de l’Institut de Mathématiques de Jussieu* **21/4** (2022), 1331 - 1362.
- 2019 2. “Grassmanniennes affines tordues sur les entiers”, [arXiv:1912.11918](#), *Forum of Mathematics Sigma* **11** (2023), Paper n° e12, 65.
- 2017 1. “The Riemannian Hebbbarkeitssätze for pseudo-rigid spaces”, [arXiv:1711.06903](#).

Funding

- 2025–29 Cluster of Excellence “Mathematics Münster: Dynamics – Geometry – Structure”, funded by the Deutsche Forschungsgemeinschaft. Principal investigator in topics 1 and 4.
- 2024–28 Collaborative Research Centre 1442 “Geometry: Deformations and Rigidity”, funded by the Deutsche Forschungsgemeinschaft. Principal Investigator in projects A1 and A5.

Talks

- 07.10.24 “TBD”, Tokyo.
- 22.04.24 “Arkhipov–Bezrukavnikov pour les groupes p-adiques”, Jussieu.
- 18.04.24 “Modular ramified Satake”, Münster.
- 23.10.23 “Arkhipov–Bezrukavnikov for p-adic groups”, Geometric and categorical representation theory, Clermont-Ferrand.
- 02.10.23 “Local models revisited”, 75th anniversary of M. Rapoport, Münster.
- 26.07.23 “Teoria geométrica das representações e geometria p-ádica”, Coimbra.
- 26.06.23 “Variétés des drapeaux et +-régularité globale”, Théorie des représentations à Lyon.
- 12.6.23 “Towards Bezrukavnikov via p-adic central sheaves”, Local Langlands and p-adic methods, Bonn.
- 03.02.23 “Towards Bezrukavnikov via p-adic local models”, Oberwolfach.
- 25.10.22 “p-adic local models II”, Münster.
- 18.10.22 “p-adic local models I”, Münster.
- 08.06.22 “Modèles locaux p-adiques : géométrie”, Paris-Nord.
- 01.06.22 “Modèles locaux p-adiques : cohomologie”, Paris-Nord.
- 26.05.22 “Mini-cours sur la théorie p-adique des modèles locaux”, Caen.
- 06.05.22 “Tubular neighborhoods of local models II”, Bonn.
- 28.04.22 “Local models for p-adic shtukas”, MPIM-Oberseminar, Bonn.
- 15.03.22 “On the p-adic theory of local models”, Hong Kong.
- 09.02.22 “On the p-adic theory of local models II”, Rampage.
- 12.01.22 “On the p-adic theory of local models”, München.

- 07.12.21 “Sur la théorie p-adique des modèles locaux”, Orsay.
- 29.11.21 “Sur la théorie p-adique des modèles locaux”, Paris Rive Gauche.
- 26.10.21 “On the p-adic theory of local models”, Fields Medal Symposium, Toronto.
- 11.11.20 “Towards the Scholze–Weinstein conjecture on local models”, London.
- 09.10.20 “Vers la conjecture de Scholze–Weinstein sur les modèles locaux”, Paris Nord.
- 24.07.20 “On the geometry of mixed characteristic affine Grassmannians”, Oberwolfach.
- 28.11.19 “Twisted affine Grassmannians in wildly ramified cases”, Bonn.
- 21.11.19 “Bruhat–Tits theory for pseudoreductive groups”, Bonn.
- 21.10.19 “Twisted affine Grassmannians over \mathbf{Z} ”, Modularity and Moduli Spaces, Oaxaca.
- 11.10.19 “Twisted affine Grassmannians and local models of Shimura varieties”, London.
- 30.08.19 “Twisted Kac-Moody groups over the integers”, Luminy.
- 20.12.18 “Local models for some wildly ramified groups”, Bonn.
- 27.04.17 “The Riemannian Hebbbarkeitssatz for pseudo-rigid spaces II”, Bonn.
- 20.04.17 “The Riemannian Hebbbarkeitssatz for pseudo-rigid spaces I”, Bonn.

Conferences

- 10.24 “Workshop on Shimura varieties, representation theory and related topics” Tokyo, Japan (speaker).
- 10.23 “Geometric and categorical representation theory” Clermont-Ferrand, France (speaker).
- 10.23 “Michael Rapoport’s 75th birthday” Münster, Germany (speaker).
- 07.23 “Matemáticos portugueses pelo mundo” Coimbra, Portugal (speaker).
- 06.23 “Théorie des représentations à Lyon” Lyon, France (speaker).
- 06.23 “Local Langlands and p-adic methods” Bonn, Germany (speaker).
- 02.23 “Arithmetic of Shimura varieties”, Oberwolfach, Germany (speaker).
- 07.22 “Summer School on The Langlands Programme”, Paris, France.
- 05.22 “30e Rencontres arithmétiques de Caen”, Caen, France (speaker).
- 11.21 “2021 Fields Medal Symposium: Peter Scholze”, Toronto, Canada (speaker).
- 07.21 “Oberwolfach Arithmetic Geometry”, Oberwolfach, Germany (speaker).
- 10.19 “Modularity and moduli spaces”, Oaxaca, Mexico (speaker).
- 08.19 “Hausdorff School on the Emerton-Gee stack and related topics”, Bonn, Germany.
- 09.19 “Immeubles et grassmanniennes affines”, Luminy, France (speaker).
- 06.19 “Arithmetic Geometry in Carthage”, Cartaghe, Tunisia.
- 05.19 “The p-adic Langlands programme and related topics”, London, England.
- 06.18 “Groupes algébriques et géométrisation du programme de Langlands”, Lyon, France.
- 04.17 “Leçons Hadamard par P. Scholze”, Paris, France.
- 03.17 “Arizona Winter School 2017: Perfectoid Spaces”, Tucson, USA.
- 10.16 “Oberwolfach Seminar on Perfectoid Spaces”, Oberwolfach, Germany.

Teaching

- Vorlesung “Lineare Algebra I”, teaching assistant of E. Viehmann.
- SS 24 Vorlesung “Algebraic Geometry II”.

- WS 23 Vorlesung “Geometrische Lineare Algebra”, teaching assistant of U. Hartl.
- SS 23 Seminar “Homological and Frobenius methods in commutative algebra”.
- WS 22 Arbeitsgemeinschaft “Bezrukavnikov”, with K. Zou.
- WS 22 Seminar “Darstellungstheorie endlicher Gruppen”, with E. Viehmann.
- WS 20 London NT study group “Geometrization of the Langlands program”, with M. Tamiozzo.

Visits

- July 22 Grenoble, with P. Achar and S. Riche.
- June 22 Paris-Nord, with S. Morra and A.-C. Le Bras.
- Fall 21 Paris-Saclay, with K. Česnavičius.
- Feb 20 Imperial College London, with A. Caraiani.
- Dec 18 Jussieu, with J. Anschütz and T. Richarz.

Referee

Annals of Mathematics, Forum of Mathematics Pi, Annales scientifiques de l’École Normale Supérieure, Mathematische Annalen, Representation theory, Canadian Journal of Mathematics, Épijournal de Géométrie Algébrique

Languages

Portuguese (native), French (C1), English (C1), German (C1), Spanish (C1), Italian (B2).

References

Thomas Haines, Timo Richarz, Simon Riche, Peter Scholze, Eva Viehmann