

# João LOURENÇO

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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. In preparation.
- 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](#).

## Talks

- 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

- 10.23 “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

- WS 23 Vorlesung “Geometrische Lineare Algebra”, with 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