# James Newton

*Updated December 2023*

## Employment

2023– **Professor**, Mathematical Institute, University of Oxford

2021– **Tutorial Fellow**, Merton College, University of Oxford

2021–2023 **Associate Professor**, Mathematical Institute, University of Oxford

2016–2021 **Lecturer/Senior Lecturer**, Department of Mathematics, King's College London

2014 – 2016 **Research associate**, Department of Mathematics, Imperial College London

2011 – 2014 **Research fellow**, DPMMS, University of Cambridge

2011 – 2014 **Junior research fellow**, Trinity College, Cambridge

Jan–Apr 2011 **Member**, Institute for Advanced Study, Princeton

## Education

2007 – 2011 **PhD**, Imperial College London
(advisor: Kevin Buzzard)

2006 – 2007 **Certificate of Advanced Study in Mathematics (Part III)**, University of Cambridge

2003 – 2006 **BA (Hons) Mathematics**, University of Cambridge

## Grants

2021 – 2025 **UKRI Future Leaders Fellowship**, £990,077
Reciprocity, functoriality and the $p$-adic Langlands programme

2011 – 2014 **EPSRC postdoctoral fellowship**, £247,241
The arithmetic of $p$-adic automorphic forms and Galois representations

## Prizes

2023 **AMS Cole Prize in Number Theory**, *awarded jointly with Jack Thorne.*

## Doctoral students

2022 – present Zachary Feng

2022 – present Håvard Damm–Jonsen (co-supervised with Jan Vonk)

2020 – 2023 Lambert A'Campo

2020 – 2021 Abigail Burton (secondary supervisor, primary supervisor Ana Caraiani)

2019 – 2022 Mafalda Santos (secondary supervisor, primary supervisor Ana Caraiani)

*Mathematical Insitute, University of Oxford*
*newton@maths.ox.ac.uk*

2018 – 2021 Ashwin Iyengar

2018 – 2021 Pol van Hoften

2018 – 2021 Hanneke Wiersema (secondary supervisor, primary supervisor Fred Diamond)

## Postdocs mentored

2022 – present Aleksander Horawa

## Conferences organised

2024 $p$-adic families of automorphic forms: theories and applications, ICMS Edinburgh

2019 The $p$-adic Langlands programme and related topics, King's College London

2018 UK–Japan Winter School, Galois Representations and Automorphic Forms, King's College London

2016 Automorphic forms: theory and computation, King's College London

## Service and other professional activities

2023 – Chair, Joint Consultative Committee with Undergraduates
Mathematical Institute, University of Oxford

2022 – Organiser, Great Western Number Theory Seminar

2018 – 2021 Postgraduate Research Tutor, Department of Mathematics, King's College London

2017 – 2019 Programme Director for Year 3 BSc/MSci Mathematics, King's College London

2016 – 2021 Member, Equality & Diversity Committee and Athena SWAN Self-Assessment Team, Department of Mathematics, King's College London

2019 – 2021 Admissions committee member, LSGNT Centre for Doctoral Training

2016 – 2021 Organiser, London Number Theory Seminar

2012 – 2014 Organiser, Number Theory Seminar, University of Cambridge

2011 – present Referee for journals including J. Amer. Math. Soc., Invent. Math., Math. Ann., Compos. Math., Duke Math. J., Algebra & Number Theory.

2021 – External examiner for Part III Mathematics, University of Cambridge
External examiner for PhDs at Cambridge, Concordia, Paris–Saclay and Warwick
Peer reviewer for EPSRC (UK), Irish Research Council and ANR (France)

## Teaching

- Masters course, 'Elliptic Curves', University of Oxford (2024)
- Undergraduate tutorials at Merton College, Oxford (2021 – present)
- Undergraduate course for first years, 'Linear Algebra & Geometry II', King's College London (2020/21)
- Undergraduate course for second and third years, 'Introduction to Number Theory', King's College London (2016 – 2020)
- Undergraduate course for third and fourth years, 'Group Representation Theory', Imperial College London (2016)

- Masters course, 'Modular Forms', University of Cambridge (2014)
- Graduate course, 'Mod $p$ and $p$-adic modular forms', University of Cambridge (2012).
- Supervisions (small group tutorials) for third year undergraduate courses in mathematics, Trinity College, Cambridge (2011 – 2014)
- Assistant for a course given by Frank Calegari at the Arizona Winter School (2013).

## Invited talks (2016 – present)

- Conference in Memory of Jan Nekovář, IHES Paris, 10/2023
- Heilbronn Conference, Bristol, 09/2023
- QuINGS (Queer In Number Theory and Geometry) workshop, 08/2023
- Conference on Global Langlands, Bonn, 08/2023
- Summer School, Bonn, 05/2023
- Spring School, Heidelberg, 03/2023
- Cambridge, Number theory seminar, 02/2023
- COGENT Online Seminar, 11/2022
- Young Researchers in Algebraic Number Theory, Glasgow, 08/2022
- Community-building in the Langlands Program, Bonn, Germany, 08/2022
- Journal of Number Theory Conference, Cetraro, Italy, 07/2022
- British Mathematical Colloquium, Number theory workshop, 06/2022
- Warwick, Number theory seminar, 05/2022
- ETH Zürich, Number theory seminar, 05/2022
- QMUL, Algebra & Number theory seminar, 05/2022
- Durham, Pure Maths Colloquium, 02/2022
- Canadian Mathematical Sociey Winter Meeting, Galois representations and $L$-functions, 12/2021
- Purdue Number Theory seminar, 11/2021
- Paris–Orsay Séminaire Arithmétique et Géométrie Algébrique, 04/2021
- Recent Advances in Modern p-Adic Geometry (RAMpAGe) Seminar, 12/2020
- UCD Algebra & Number Theory Seminar, Dublin, 11/2020
- Columbia–CUNY–NYU Number Theory Seminar, 10/2020
- Berkeley–Caltech–Stanford Number Theory Seminar, 10/2020
- Global Langlands, Shimura varieties, and shtukas, Bonn, 08/2020 (*cancelled due to COVID-19*)
- PIMS–Germany Summer School on Eigenvarieties, Vancouver, 08/2020 (*cancelled due to COVID-19*)
- Summer School on the Arithmetic of the Langlands Program, Bonn, 05/2020 (*cancelled due to COVID-19*)
- HUJI–BGU Algebraic Geometry & Number Theory Seminar, 05/2020
- Peking Online International Number Theory Seminar, 05/2020
- Harvard Number Theory Seminar, 05/2020
- Journées arithmétiques de LAGA, Paris, 03/2020
- Oxford Number Theory Seminar, 02/2020
- London Number Theory Seminar, 2019
- Hausdorff School on the Emerton-Gee stack and related topics, summer school, Bonn, 2019
- $p$-adic modular forms and Galois representations, conference, Sheffield, UK, 2019
- $p$-adic methods in arithmetic Cardedeu, Spain, 2019
- $p$-adic Langlands correspondence and Iwasawa theory, conference, Lille, France, 2019

- University of Gothenburg/Chalmers Number Theory Seminar, 2019
- Workshop on Galois Representations, Heidelberg, Germany, 2018
- Number Theory Seminar, University of Warwick, UK, 2018
- Summer School on Modular Forms, workshop, Padova, Italy, 2017
- London Number Theory Seminar, 2016
- Deformation theory, completed cohomology, Leopoldt conjecture and $K$-theory, workshop, CIRM, Luminy, France, 2016
- London–Paris Number Theory Seminar, UPMC, Paris, France, 2016
- Number Theory Seminar, University of Sheffield, UK, 2016
- Number Theory Seminar, University of Cambridge, UK, 2016
- The $p$-adic Langlands program and related topics, conference, Indiana University, USA, 2016

## Publications

1. *Geometric level raising for $p$-adic automorphic forms.*
   Compos. Math., 147(2):335–354, 2011.
2. *Level raising and completed cohomology.*
   IMRN, (11):2565–2576, 2011.
3. *Completed cohomology of Shimura curves and a $p$-adic Jacquet-Langlands correspondence.*
   Math. Ann., 355(2):729–763, 2013.
4. *Serre weights and Shimura curves.*
   Proc. LMS, 108(6):1471–1500, 2014.
5. *Towards local-global compatibility for Hilbert modular forms of low weight.*
   Algebra & Number Theory, 9(4):957–980, 2015.
6. *Level raising for $p$-adic Hilbert modular forms.*
   J. Théor. Nombres Bordeaux, 28(3):621–653, 2016.
7. *Torsion Galois representations over CM fields and Hecke algebras in the derived category.*
   Forum Math. Sigma, 4:e21, 88, 2016. (Joint with J. Thorne)
8. *The dimension of irreducible components*, an appendix to *Universal eigenvarieties, trianguline Galois representations, and $p$-adic Langlands functoriality* by D. Hansen
   J. Reine Angew. Math., 730:60–62, 2017.
9. *Extended eigenvarieties for overconvergent cohomology.*
   Algebra & Number Theory, 13(1):93–158, 2019. (Joint with C. Johansson)
10. *Irreducible components of extended eigenvarieties and interpolating Langlands functoriality.*
    Math. Res. Lett., 26(1):159–201, 2019. (Joint with C. Johansson)
11. *Irreducible components of the eigencurve of finite degree are finite over the weight space.*
    J. Reine Angew. Math., 763:251–269, 2020. (Joint with S. Hattori)
12. *Parallel weight 2 points on Hilbert modular eigenvarieties and the parity conjecture.*
    Forum Math. Sigma, 7:e27, 2019. (Joint with C. Johansson)
13. *Local Langlands correspondence in rigid families.*
    Pacific J. Math., 304(1):65–102, 2020. (Joint with C. Johansson and C. Sorensen)
14. *Patching and the completed homology of locally symmetric spaces.*
    J. Inst. Math. Jussieu, 21(2):395–458, 2022. (Joint with T. Gee)
15. *Adjoint Selmer groups of automorphic Galois representations of unitary type*

J. Eur. Math. Soc., 25(5):1919–1967, 2023. (Joint with J. Thorne)

16. *Automorphy lifting for residually reducible $l$-adic Galois representations, II*
    Compos. Math., 156(11):2399–2422, 2020 (Joint with P. Allen and J. Thorne)
17. *Monodromy for some rank two Galois representations over CM fields.*
    Doc. Math., 25:2487–2506, 2020 (Joint with P. Allen)
18. *Symmetric power functoriality for holomorphic modular forms.*
    Publ. Math. IHÉS, 134:1-116, 2021. (Joint with J. Thorne)
19. *Symmetric power functoriality for holomorphic modular forms, II.*
    Publ. Math. IHÉS, 134:117-152, 2021. (Joint with J. Thorne)
20. *Modularity of Galois representations and Langlands functoriality.* (Expository article.)
    J. Indian Inst. Sci., 102:861–884, 2022.
21. *Potential automorphy over CM fields.*
    Ann. of Math., 197(3):897–1113, 2023. (Joint with P. Allen, F. Calegari, A. Caraiani, T. Gee, D. Helm, B. V. Le Hung, P. Scholze, R. Taylor and J. Thorne)

## Preprints

1. *Symmetric power functoriality for Hilbert modular forms.*
   Preprint, `https://arxiv.org/abs/2212.03595`. (Joint with J. Thorne)
2. *On the modularity of elliptic curves over imaginary quadratic fields.*
   Preprint, `https://arxiv.org/abs/2301.10509`. (Joint with A. Caraiani)
3. *The Ramanujan and Sato-Tate Conjectures for Bianchi modular forms.*
   Preprint, `https://arxiv.org/abs/2309.15880`. (Joint with G. Boxer, F. Calegari, T. Gee and J. Thorne)
4. *Non-abelian base change for symmetric power liftings of holomorphic modular forms.*
   Preprint, `https://arxiv.org/abs/2312.01774`. (Joint with L. Clozel and J. Thorne)