Abhishek Saha

CONTACT INFORMATION

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PERSONAL

Born *December 1982* in Kolkata, India. British citizen.

EMPLOYMENT

- **Queen Mary University of London** (permanent position)
  Professor of Mathematics, *August 2021 – present.*
  Reader in Mathematics, *September 2019 – July 2021.*
  Lecturer in Number Theory, *August 2017 – September 2019.*
- **University of Bristol** (permanent position)
  Lecturer in Number Theory, *September 2012 – July 2017.*
- **ETH Zurich** (fixed-term position)
  Postdoc, *September 2009 – August 2012.*

EDUCATION

- **California Institute of Technology**
  Ph.D. in Mathematics, *June 2009.*
  Thesis title: *On critical values of L-functions for holomorphic forms on* $GSp(4) \times GL(2)$
  Thesis advisor: *Dinakar Ramakrishnan*
- **Indian Statistical Institute, Bangalore**
  Bachelor (B. Math. Hons. with distinction), *June 2004.*

GRANTS

- EPSRC Research Grant under the Small Grants Scheme, "Fourier coefficients, periods and L-functions", £73992, 2024-2025.
- LMS Scheme 3 Grant (Workshop), £3000, September 2023.
- EPSRC Research Grant under the Small Grants Scheme, "New bounds towards Fourier coefficients of Siegel modular forms", £80624, 2021-2022.
- EPSRC Research Grant, "Automorphic forms on higher rank groups: Fourier coefficients, L-functions, and arithmetic", £458475, 2020-2023.
- Leverhulme Trust Research Project Grant, "New investigations in automorphic forms: analytic and arithmetic interfaces", £293685, 2019-2023.
- LMS Scheme 4 Grant (Research in pairs), £1000, June 2019.
- EPSRC First Grant, "Arithmetic aspects of automorphic forms: Petersson norms and special values of L-functions", £91588, 2014-2016.
- ETH Fellowship, "Arithmetic study of the L-function product of Siegel cusp forms of genus 2 and classical modular forms", CHF 207900, 2009-2011.

HONORS AND AWARDS

- *Research Excellence Award*, presented by the Faculty of Science and Engineering at Queen Mary University of London, January 2022.
- Nominated for *Online Learning Champion* as part of the 2021 QMSU Education awards.
- Named as *Top Lecturer* by the School of Mathematical Sciences at QMUL in May 2019.
- *Scott Russell Johnson Graduate Dissertation Prize in Mathematics*, California Institute of Technology, 2009.

- ◇ *Scott Russell Johnson Prize for Excellence in Graduate Studies in Mathematics (research)*, California Institute of Technology, 2006.
- ◇ *Scott Russell Johnson Prize for Excellence in Graduate Studies in Mathematics (excellent first year student)*, California Institute of Technology, 2005.
- ◇ *Silver Medal at the 42nd International Mathematical Olympiad*, USA, 2001.
- ◇ *Silver Medal at the 41st International Mathematical Olympiad*, Korea, 2000.
- ◇ *Bronze Medal at the 40th International Mathematical Olympiad*, Romania, 1999.
- ◇ *Kishore Vaigyanik Protsahan Yojana fellowship*, awarded by the Government of India, 1999-2004.

Significant roles

- ◇ Member of QMUL Senate (September 2024 -)
- ◇ REF and Reputation Lead at the School of Mathematical Sciences, QMUL (June 2023 -).
- ◇ Member of the QMUL working group on freedom of speech policy (January 2023 -).
- ◇ Founder Member of the London Universities' Council for Academic Freedom.
- ◇ Co-founder and co-convenor of the QMUL branch for Academics for Academic Freedom.
- ◇ Head of the Algebra and Number Theory group at the School of Mathematical Sciences, QMUL (September 2020 - August 2023).
- ◇ Deputy Director of Research at the School of Mathematical Sciences, QMUL (September 2018 - August 2023).
- ◇ Visiting Adjunct Faculty, TIFR Mumbai, 2014-2016 (this is a prestigious visiting appointment granted as recognition of research excellence).

Research Interests

- ◇ Classical and higher rank modular forms, automorphic forms and representations, L-functions, analytic number theory, representations of p-adic groups.

Mathematical preprints and papers

1. **Bounds on Fourier coefficients and global sup-norms for Siegel cusp forms of degree 2** (with F. Comtat and J. Marzec-Ballesteros),
   preprint available at arXiv (2023).
2. **Simple supercuspidal representations of GSp_4 and test vectors** (with A. Pitale and R. Schmidt),
   preprint available at arXiv (2023).
3. **Mass equidistribution for Saito-Kurokawa lifts** (with J. Jaasaari and S. Lester),
   Geom. Funct. Anal. (GAFA) (2024).
4. **The Manin constant and the modular degree** (with K. Česnavičius and M. Neururer),
   J. Eur. Math. Soc. (JEMS) (2024), 2: 573-637.
5. **On Fourier coefficients and Hecke eigenvalues of Siegel cusp forms of degree** 2 (with B. Paul),
   Int. Math. Res. Not. IMRN (2023), 24: 21707-21760.
6. **The special values of the standard L-functions for $\mathrm{GSp}_{2n} \times \mathrm{GL}_1$** (with S. Horinaga, A. Pitale and R. Schmidt),
   Trans. Amer. Math. Soc. (2022), 375: 6947-6982.
7. **Integrality and cuspidality of pullbacks of nearly holomorphic Siegel Eisenstein series** (with A. Pitale and R. Schmidt),
   Publicacions Matematiques (2022), 66(1): 405-434.
8. **On fundamental Fourier coefficients of Siegel cusp forms of degree 2** (with J. Jaasaari and S. Lester),
   J. Inst. Math. Jussieu (2021), 22(4): 1819-1869.

9. **On the standard L-function for $\mathrm{GSp}_{2n} \times \mathrm{GL}_1$ and algebraicity of symmetric fourth L-values for GL_2** (with A. Pitale and R. Schmidt),
Annales mathématiques du Québec (2021), 45: 113-159.
10. **Lowest weight modules of $\mathrm{Sp}_4(\mathbb{R})$ and nearly holomorphic Siegel modular forms** (with A. Pitale and R. Schmidt),
Kyoto J. Math. (2021), 61(4): 745-814.
11. **Sup-norms of eigenfunctions in the level aspect for compact arithmetic surfaces, II: newforms and subconvexity** (with Y. Hu),
Compositio Math. (2020), 156(11): 2368-2398.
12. **Sup-norms of eigenfunctions in the level aspect for compact arithmetic surfaces**,
Math. Ann. (2020), 376(1): 609-644.
13. **Explicit refinements of Böcherer's conjecture for Siegel modular forms of square-free level** (with M. Dickson, A. Pitale and R. Schmidt),
J. Math. Soc. Japan (2020), 72(1): 251-301.
14. **Some analytic aspects of automorphic forms on GL(2) of minimal type** (with P. Nelson and Y. Hu),
Comm. Math. Helv. (2019), 94(4): 767-801.
15. **On the order of vanishing of newforms at cusps** (with A. Corbett),
Math. Res. Lett. (2018), 25(6):1771-1804.
16. **A note on the growth of nearly holomorphic vector-valued Siegel modular forms** (with A. Pitale and R. Schmidt),
L-functions and automorphic forms, *Contributions in Mathematical and Computational Sciences*, Springer (2018).
17. **Hybrid sup-norm bounds for Maass newforms of powerful level**,
Algebra and Number Theory (2017), 11(5):1009-1045.
18. **Local and global Maass relations** (with A. Pitale and R. Schmidt),
Math. Z. (2017), 287(1-2):655-677.
19. **On sup-norms of cusp forms of powerful level**,
J. Eur. Math. Soc. (JEMS) (2017), 19(11):3549-3573.
20. **Representations of $\mathrm{SL}_2(\mathbb{R})$ and nearly holomorphic modular forms** (with A. Pitale and R. Schmidt),
RIMS Kokyuroku (2016), 1973:141-153.
21. **Large values of newforms on $\mathrm{GL}(2)$ with highly ramified central character**,
Int. Math. Res. Not. IMRN (2016), 2016(13):4103-4131.
22. **On ratios of Petersson norms for Yoshida lifts**,
Forum Mathematicum (2015), 27(4):2361-2412.
23. **Transfer of Siegel cusp forms of degree 2** (with A. Pitale and R. Schmidt),
Mem. Amer. Math. Soc., (2014), 232(1090).
24. **Bounds for Rankin-Selberg integrals and quantum unique ergodicity for powerful levels** (with P. Nelson and A. Pitale),
J. Amer. Math. Soc., (2014), 27:147-191.
25. **A relation between multiplicity one and Böcherer's conjecture**,
Ramanujan J., (2014), 33(2):263-268.
26. **Determination of modular forms by fundamental Fourier coefficients**,
Proceedings of the International Colloquium on Automorphic Representations and L-functions, 2013.

27. **Yoshida lifts and simultaneous non-vanishing of dihedral twists of modular L-functions** (with R. Schmidt),
J. Lond. Math. Soc., (2013), 88 (1):251-270.
28. **Siegel cusp forms of degree 2 are determined by their fundamental Fourier coefficients**,
Math. Ann. (2013), 355(1):363–380.
29. **Local spectral equidistribution for Siegel modular forms and applications** (with E. Kowalski and J. Tsimerman),
Compositio Math. (2012), 148(2):335–384.
30. **Prime density results for Hecke eigenvalues of a Siegel cusp form**,
Int. J. Number Theory (2011), 7(4):971-979.
31. **A note on Fourier coefficients of Poincare series** (with E. Kowalski and J. Tsimerman),
Mathematika (2011), 57(1):31–40.
32. **Pullbacks of Eisenstein series from $GU(3,3)$ and critical L-values for $GSp(4)\times GL(2)$**,
Pacific J. Math. (2010), 246(2):435–486.
33. **L-functions for holomorphic forms on $GSp(4)\times GL(2)$ and their special values**,
Int. Math. Res. Not. IMRN (2009), 2009(10):1773–1837.
34. **Hilbert Modular forms of weight $1/2$ and Theta Functions** (with S. Achimescu),
J. Number Theory (2008), 128(12):3037–3062.

Articles for a broader audience

- ◇ Peer-reviewed journals
  1. **Equality, Diversity and Inclusion in the mathematics community: a perspective on data and policy**, *European Review* 2024:1-13. doi:10.1017/S106279872400015.
- ◇ Websites, blogs and magazines
  1. **The likely repeal of England's free speech act is a tragedy**, *Times Higher Education*, published online on 30 July 2024.
  2. **Academic freedom should not be restricted to supposed core expertise**, *Times Higher Education*, published online on 17 April 2024.
  3. **OfS should hold firm on 30-day limit for resolving free-speech complaints**, *Times Higher Education*, published online on 2 April 2024.
  4. **Protecting Free Speech in Universities: Insights from the UK**, *Heterodox Academy blog*, published online on 14 February 2024.

International conferences as invited speaker

- ◇ New Perspectives in the Analytic Theory of Automorphic Forms *Clay Mathematics Institute, Oxford*, September 2023.
- ◇ Analytic Number Theory and Automorphic Forms Conference, *University of Patras*, July 2023.
- ◇ Group Actions and Harmonic Analysis in Number Theory, *MFO, Oberwolfach*, June 2023.
- ◇ Automorphic Forms Conference, *Renyi Institute, Budapest*, September 2022.
- ◇ Automorphic Forms and Arithmetic, *MFO, Oberwolfach*, September 2020.
- ◇ Modular Forms on Higher Rank Groups, *TU Darmstadt*, September 2019.
- ◇ Geometric and analytic number theory, *University of Goettingen*, November 2018.
- ◇ Elementare und Analytische Zahlentheorie (ELAZ), *MPIM, Bonn*, September 2018.
- ◇ Analytic Number Theory and Quantum Chaos, *Queen Mary University of London*, July 2018.
- ◇ Building Bridges: 4th EU/US Workshop, *Alfred Renyi Institute of Mathematics, Budapest*, July 2018.
- ◇ 32nd Automorphic Forms Workshop, *Tufts University*, March 2018.

- ◇ Automorphic Forms and Arithmetic, *MFO, Oberwolfach*, September 2017.
- ◇ Spectral Theory, Automorphic Forms and Arithmetic, *University of Copenhagen*, November 2016.
- ◇ L-functions and Automorphic forms, *University of Heidelberg*, February 2016.
- ◇ Colloquium on Analytic Number Theory, *TIFR, India*, January 2015.
- ◇ Workshop on Siegel and Bianchi modular forms, *Sheffield University*, May 2014.
- ◇ 28th Automorphic Forms Workshop, *Moab, Utah*, May 2014.
- ◇ British Mathematical colloquium, *QMUL*, April 2014.
- ◇ Building Bridges: 2nd EU/US Workshop, *University of Bristol*, April 2014.
- ◇ Automorphic forms and arithmetic, *University of Goettingen*, January 2014.
- ◇ 27th Automorphic Forms Workshop, *University of Dublin*, March 2013.
- ◇ L-functions of automorphic forms and related problems, *Tokyo University*, March 2012.
- ◇ International Colloquium on Automorphic Representations, *TIFR, India*, January 2012.
- ◇ TORA Workshop, *University of North Texas*, May 2011.
- ◇ 25th Automorphic Forms Workshop, *University of Oregon*, March 2011.
- ◇ AMS special session on Automorphic forms, L-functions and applications, *New Jersey Institute of Technology, USA*, May 2010.

Research seminars and department colloquiums

- ◇ My presentations at research seminars around the world as invited speaker include at Caltech (twice), Oklahoma State University (twice), University of Oklahoma (four times), University of North Texas, Texas A&M, Ohio State University (twice), UC San Diego, IISER Pune (twice), TIFR (twice), IIT Mumbai, University of Montreal, ETH Zurich (thrice), EPF Lausanne (twice), Heidelberg University, University of Duisberg-Essen, University of Bielefeld, Mannheim University (twice), University of Zagreb, University College Dublin, Imperial College London (twice), Warwick University (twice), University of Sheffield (twice), University of Nottingham (twice), University of Oregon, University of Koln, Oxford University, Cambridge University, Queen Mary University of London, University of Exeter, University of East Anglia, University of Kent, and University of Bristol (twice).

Postdoctoral researchers supervised

- ◇ Félicien Comtat, *Queen Mary University of London*, September 2022 – July 2023.
- ◇ Biplab Paul, *Queen Mary University of London*, November 2021 – June 2022.
- ◇ Jesse Jaasaari, *Queen Mary University of London*, June 2020 – August 2023.
- ◇ Han Wu, *Queen Mary University of London*, October 2019 – October 2022.
- ◇ Martin Dickson, *University of Bristol*, May 2015 – Jan 2016.

Ph.D. students supervised

- ◇ Timothy Davis, *Queen Mary University of London*, September 2019 – September 2023.
- ◇ Félicien Comtat, *Queen Mary University of London*, September 2018 – August 2022 .
- ◇ Edgar Assing, *University of Bristol*, September 2015 – March 2019.
- ◇ Andrew Corbett, *University of Bristol*, September 2013 – April 2017.
- ◇ Jolanta Marzec, *University of Bristol*, September 2012 – May 2016.
- ◇ Martin Dickson, *University of Bristol*, September 2012 – April 2015.

Teaching Experience

- ◇ **Queen Mary University of London**

  Lecturer/Module organiser

  Third year projects, Autumn 2023.

  Vectors and Matrices, Spring 2021, 2022, 2023.

Coding Theory, Spring 2019.

Calculus III, Autumn 2017.

Tutorials

Numbers, sets and functions, 2017, 2018.

Complex variables, 2018.

◇ **University of Bristol**

Lecturer/Module organiser

Linear Algebra 2, Autumn 2016.

Galois theory, Autumn 2012, Autumn 2013.

Algebraic number theory, Spring 2013, Spring 2014, Spring 2015.

Number theory, Spring 2015.

Tutorials

Foundations and Proof, 2015-2016.

Group Theory, 2015-2016.

Analysis, 2012-2016.

Number theory and group theory, 2012-2014.

◇ **ETH Zurich**

Lecturer/Module organiser

An introduction to adeles and L-functions, Spring 2010/2011.

◇ **California Institute of Technology**

Instructor

Ma 17 How to Solve It, Autumn 2007.

Teaching Assistant (recitation sessions and grading)

Ma 1 Calculus of One and Several Variables and Linear Algebra, Autumn, Winter, Spring 2005/2006.

Ma 2 Probability and Statistics, Winter 2007.

Teaching Assistant (grading and office hours)

Ma 3 Number Theory for Beginners, Spring 2006/2007.

Ma 6 Introduction to Discrete Mathematics, Winter, Spring 2007/2008, Autumn, Winter 2008/2009.

Ma 120 Abstract Algebra, Autumn, Winter, Spring 2004/2005.

Ma 121 Combinatorial Analysis, Autumn, Winter 2008/2009.

Ma 130 Algebraic Geometry, Autumn, Winter 2006/2007.

Miscellaneous

◇ "Coffee and Cake Morning" founder and organiser at SMS, QMUL (September 2018 -).

◇ International exchange coordinator at SMS, QMUL (September 2017 to November 2018).

◇ Member of several recruitment/interview panels at QMUL and Bristol.

◇ Member of several departmental committees at QMUL.

◇ Organiser of the Algebra seminar at SMS, QMUL in Autumn 2017.

◇ Organiser of the Bristol Heilbronn number theory seminar from 2014 to 2016.

◇ Study Abroad Academic Director at the School of Mathematics at University of Bristol in 2016-2017.

◇ Fellow of the Higher Education Academy.

◇ Refereed over 60 papers and 2 books.

◇ Reviewed over 20 grant Applications.

References

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