Aditya Chandrashekhar Karnataki

Contact Information

A-18 Shanti Sagar Apartment
Nehru Road
Dombivli (East)
District: Thane, Maharashtra-421201
India

+91 7738124802
Karnatakiaditya@gmail.com

Research Interests

Arithmetic Geometry and Number Theory, Cohomology of Shimura varieties, p-adic automorphic forms, p-adic Hodge theory, Galois representations, Artin L-functions, Counting arithmetic objects.

Employment

2021 - – **Beijing International Center for Mathematical Research**, Beijing, Visitor (Host: Ruochuan Liu).

2017 - 2021 **Beijing International Center for Mathematical Research**, Beijing, Post-doctoral researcher.

2016 - 2017 **Tata Institute of Fundamental Research**, Mumbai, Post-doctoral fellow.

Education

Boston University

Ph.D., Mathematics (May 2016)

- Dissertation Topic: Two theorems on Shimura varieties and Galois representations.
- Advisor: David Rohrlich

M.A. in Mathematics, September 2012

Chennai Mathematical Institute

B.Sc. in Mathematics and Computer Science with honors, July 2010

- Highest honors in mathematics, highest distinction in general scholarship
- Minor in Computer Science

Publications

Debargha Banerjee, Aditya Karnataki, *Spectral p-adic Jacquet-Langlands correspondence for* GSp_4*,* in preparation.

Aditya Karnataki, Ruochuan Liu, *Families of Galois representations,* Preprint available upon request.

Aditya Karnataki, Leo Poyéton, *Families of Galois representations and* (φ, τ)*-modules,* available at https://arxiv.org/abs/2111.08432, *submitted.*

Aditya Karnataki, *Level-raising for automorphic forms on* GL_n*,* Trans. Amer. Math. Soc. **374** (2021), $8547 - 8572$.

Aditya Karnataki, *Self-dual Artin representations of dimension three (with an appendix by David E. Rohrlich),* J. Number Theory(2017), Vol. 173, $425 - 447$.

Invited Talks

Families of (φ, τ)*-modules and Galois representations*, Tata Institute of Fundamental Research, Mumbai. (December 2021)

Families of (φ, τ)*-modules and Galois representations*, Indian Institute of Science, Bangalore. (October 2021)

Families of (φ, τ)-modules and Galois representations, Boston University, Boston. (September 2021)

Families of Galois representations on the eigencurve, Chennai Mathematical Institute, Chennai. (February 2020)

p-adic automorphic forms in the sense of Scholze (minicourse), International Centre for Theoretical Sciences, Bangalore. (September 2019)

Almost Galois descent (minicourse), Morningside Center of Mathematics, Beijing. (September 2019)

Local deformation rings at $\ell \neq p$ (minicourse), Morningside Center of Mathematics, Beijing. (August 2019)

Level-raising for automorphic forms on GL_n, Yau Mathematical Sciences Center, Tsinghua University, Beijing. (May 2019)

Finiteness of Cohomology of Arithmetic families of (φ, Γ)-modules, Tata Institute of Fundamental Research, Mumbai, India. (February 2019)

Level-raising for automorphic forms on GL_n, Korean Institute of Advanced Studies, Seoul, Korea. (October 2018)

Level-raising for automorphic forms on GL_n, 2018 Young Mathematician Forum, Beijing International Center for Mathematical Reseach, Beijing. (July 2018)

p-adic uniformization of locally symmetric spaces, Indian Institute of Science Education and Research, Pune. (January 2017)

p-adic uniformization of locally symmetric spaces, Conference on Theoretical and Computational Aspects of the Birch and Swinnerton-Dyer Conjecture, International Centre for Theoretical Sciences, Bangalore. (December 2016)

p-adic uniformization of locally symmetric spaces, Tata Institute of Fundamental Research, Mumbai. (September 2016)

Canonical models of certain locally symmetric spaces, AMS graduate student math conference, Brown University. (April 2016)

Self-dual Artin representations of dimension three, University of Connecticut. (September 2015)

Density of self-dual Artin representations of dimension three, Tata Institute of Fundamental Research, Mumbai. (June 2015)

Self-dual Artin representations of dimension three, Boston-Keio summer workshop, Boston University. (September 2015)

Self-dual Artin representations of dimension three, Boston University. (March 2015)

On the density of primes modulo 2π, École Normale Supérieure, Paris. (June 2010)

Other Talks (Including contributed talks)

Simplicial rings and derived de Rham complex, Beijing International Center for Math-

ematical Research, Beijing. (Spring 2019)

Diamonds and p-adic Hodge theory (4 talks), Tata Institute of Fundamental Research, Mumbai. (Spring 2017)

Moduli of p-divisible groups (6 talks), Tata Institute of Fundamental Research, Mumbai. (Fall 2016)

Self-dual Artin representations of dimension three, Midwest number theory conference for graduate students, University of Illinois at Chicago. (October 2015)

Select Conferences Attended

Perfectoid Spaces, International Center for Theoretical Sciences, Bangalore. (September 2019)

Conference in Arithmetic geometry on the occasion of Rapoport's Birthday , Universitat Bonn, Bonn. (October 2018)

Mathematics is a long conversation: a celebration of Barry Mazur, Harvard University, Boston. (June 2018)

p-adic Hodge theory and automorphic forms, Beijing International Center for Mathematical Research, Beijing. (June 2017)

Oberwolfach Seminar on Perfectoid Spaces, Mathematische Foschunginstitut Oberwolfach. (October 2016)

Automorphic forms, Shimura varieties, Galois representations, L-functions (dedicated to Michael Harris), MSRI Berkeley. (December 2014)

p-adic variations in number theory (Glennfest), Boston University. (June 2014)

Hot Topics Workshop : Perfectoid spaces and their applications, MSRI Berkeley. (February 2014)

International Colloquium on Automorphic forms and Galois representations, Tata Institute of Fundamental Research, Mumbai. (January 2012)

Honors and Awards

Kishore Vaigyanik Protsahan Yojana Fellow, Indian Institute of Science, Bangalore.

National Talent Search Fellow, National Council of Educational Research and Training, Delhi.

Activities and Visiting

Spring	2017	Organizer of Diamonds seminar, TIFR Mumbai.
Fall	2016	Organizer of Perfectoid seminar, TIFR Mumbai.
Fall	2015	Organizer of Seminar on congruences of modular forms, Boston University.
Fall	2014	Co-organizer of Seminar on p-adic Hodge theory, Boston University.
Spring	2014	Co-organizer of Local Langlands Seminar, Boston University.
Spring	2011	Co-organizer of Seminar on etale cohomology, Boston University.
Summer	2010	Exchange student at École Normale Supérieure, Paris.

Teaching

Beijing International Center for Mathematical Research - Taught in minicourses and seminars aimed at graduate students and faculty.

- Minicourse on Almost Galois descent.
- Minicourse on local deformation rings.
- Reading Seminar on Simplicial rings and derived de Rham complex.

Boston University - Served as teaching assistant and faculty on a variety of courses.

- Teaching assistant for 12 semesters from Fall 2010 to Spring 2016 for a variety of courses including Calculus I, II, III.
- Faculty for Maths 341 Number Theory in Summer 2014.

Community Outreach

PROMYS - Program in Mathematics for Young Scientists. An immersive high-school Summer program focused on teaching number theory and methods of mathematical research.

- Assistant Director, PROMYS India. (Launch of physical program postponed to 2023 due to Covid Pandemic.)
- Faculty, PROMYS. (2021)
- Counsellor for Teachers, PROMYS. (2011 and 2012)

Yau Tsinghua Mathcamp - An intense high-school Summer program at Tsinghua University focused on enabling students to learn about modern mathematics and research in it.

- Faculty, Summer 2019.

Nationality

Indian

Relevant Skills

Languages: English, French, Chinese(rudimentary).

References

David Rohrlich,
Boston University, rohrlich@math.bu.edu

Ruochuan Liu,
Beijing International Center for Mathematical Research, liuruochuan@math.pku.edu.cn

Jack Thorne,
DPMMS, University of Cambridge, thorne@dpmms.cam.ac.uk

Liang Xiao,
Beijing International Center for Mathematical Research, lxiao@bicmr.pku.edu.cn

Kiran Kedlaya,
University of California San Diego, kedlaya@ucsd.edu

Jared Weinstein,
Boston University, jsweinst@math.bu.edu