Rahul Krishna

Contact Information

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Research interests

- Algebraic number theory.
- Automorphic forms and related geometry.
- Cryptography and applications of number theory.
- Machine learning and neural networks.

Education

Columbia University, New York, NY

Ph.D. in Mathematics, 2016
Advisor: Wei Zhang

Princeton University, Princeton, NJ

A.B. in Mathematics, *magna cum laude*, 2010
Advisor: Peter Sarnak

Employment

Brandeis University

Instructor, Sept. 2019 - June 2023

Northwestern University

Boas Assistant Professor, Sept. 2016 - August 2019

Papers

1. *A new proof of the Waldspurger formula I.*, Algebra and Number Theory, March 2019.
2. *On the global Gross-Prasad conjecture for orthogonal groups*, in preparation.
3. *Relative trace formula and the Gan-Gross-Prasad conjecture for Fourier-Jacobi periods*, in progress.
4. *A new proof of the Waldspurger formula II.*, in progress.

For work that is listed as in preparation or in progress, please contact me for more information.

Selected Invited Talks

- The automorphic seminar	Mar. 30, 2021
- University of Arizona	Feb. 4, 2020
- University of Wisconsin-Madison number theory seminar	Jan. 23, 2020
- Clay Research Conference, Oxford	Oct. 4, 2019
- AMS special session, University of Wisconsin-Madison	Sep. 19, 2019
- AMS special session, University of Hawaii	Mar. 22, 2019
- MIT number theory seminar	Oct. 30, 2018
- AMS special session, Ann Arbor	Oct. 20, 2018
- University of Minnesota automorphic forms seminar	Mar. 2, 2018
- UC Berkeley number theory seminar	Feb. 26, 2018
- Boston College automorphic forms seminar	Feb. 8, 2018
- Boston University number theory seminar	Feb. 5, 2018
- University of Chicago number theory seminar	Jan. 31, 2017
- University of Oregon number theory seminar	Jan. 18, 2017
- UIUC number theory seminar	Nov. 10, 2016
- Northwestern number theory seminar	Oct. 26, 2016
- AIM meeting, "Automorphic kernel functions"	Dec. 2015
- Columbia university "Goldfeld seminar"	Nov. 2015

Selected Conferences and Visits

- L-Functions and Geometric Representation Theory, Nisyros	Jul. 22-27, 2019
- AMS special session, Ann Arbor	Oct. 20-11, 2018
- Visiting Yiannis Sakellaridis at IAS	March 12-16, 2018
- IAS workshop on "representation theory and analysis on locally symmetric spaces"	March 5-9, 2018
- Visiting Ali Altug at Boston University	Feb. 5-9 2018
- AIM workshop on "functoriality and the trace formula"	Dec. 4-8, 2017
- Paul J. Sally Jr. midwest representation theory conference, honoring the 70th birthday of Freydoon Shahidi	Oct. 20-22, 2017
- Mini workshop on "geometric methods in number theory and representation theory" at Northwestern.	May 27-28, 2017
- AIM workshop on "automorphic kernel functions"	Nov. 30- Dec. 5, 2015
- MSRI workshop on "automorphic forms, Shimura varieties, Galois representations, and L-functions"	Dec. 1-5, 2014
- Summer school on "the Gan-Gross-Prasad conjecture" in Paris	June 18-27, 2014
- Banff workshop on "the future of trace formulas"	June 1-6, 2014
- Visiting Zhiwei Yun at Stanford University	May 1-14, 2014

Teaching

Brandeis

MATH 20A: Multivariable calculus; 1 section	Spring 2023
MATH 115A: Introduction to complex analysis; 1 section	Spring 2023
MATH 252A: Graduate algebraic geometry; 1 section	Fall 2022
MATH 211A: Graduate real analysis; 1 section	Fall 2022
MATH 115A: Introduction to complex analysis; 1 section	Spring 2022
MATH 100A: Introduction to abstract algebra; 1 section	Fall 2021
MATH 35A: Advanced calculus and Fourier analysis; 1 section	Fall 2021
MATH 15A: Applied linear algebra; 1 section	Spring 2021
MATH 141A: Graduate real analysis; 1 section	Fall 2020
MATH 23B: Introduction to proof; 1 section	Fall 2020
MATH 23B: Introduction to proof; 1 section	Spring 2020
MATH 15A: Applied linear algebra; 1 section	Spring 2020
MATH 15A: Applied linear algebra; 1 section	Fall 2019

Northwestern

	MATH 230: Differential multivariable calculus; 2 sections	Fall 2018
	MATH 224: Integral single variable calculus; 1 section	Spring 2018
	MATH 482-2: An introduction to the trace formula (graduate topics class); 1 section	Spring 2018
	MATH 224: Integral single variable calculus; 2 sections	Fall 2017
	MATH 230: Differential multivariable calculus; 1 sections	Spring 2017
	MATH 482-2: Modular forms and their attached Galois representations (graduate topics class); 1 section	Spring 2017
	MATH 224: Integral single variable calculus; 2 sections	Fall 2016
Columbia	College algebra and analytic geometry: Precalculus; 1 section	Fall 2015
	Calculus III: Differential multivariable calculus; 1 section	Summer 2014
	Calculus II: Integral single variable calculus; 1 section	Summer 2011

Other mentorship and advising

- Mentor for Yu Xin and Kewen Wang, PhD students at Brandeis, as they completed their thesis work. This involved weekly multiple hour meetings, discussions, and learning seminars.
- Sole advisor and supervisor for Gus Schmidt, Master's student at Brandeis, as he wrote his Master's thesis "Spreading out the Riemann-Roch theorem".
- Primary organizer for multiple learning and research seminars at Brandeis. These include the "Everytopic seminar" at Brandeis (Fall 2019 - Spring 2021); as well as various learning seminars, among which were "The number theory learning group on complex multiplication," "The number theory learning group on Eisenstein series and the Langlands-Shahidi method".
- Primary organizer (Fall 2018 - Winter 2019) and coorganizer (Fall 2016 - Spring 2019) for the number theory seminar at Northwestern University.
- Coorganized the conference "Geometric methods in number theory and representation theory" at Northwestern University, May 2017.
- Principal instructor and director for the RTG Summer Research Experience for Undergraduates. Topic: "Apollonian circle packings and related number theory" (joint between Columbia, CUNY, and NYU), Summer 2012.