

# RAHUL DALAL

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## POSITIONS

### Succinct Inc.

Cryptography Engineer

### University of Vienna

Postdoc

PI: Alberto Minguez

### Johns Hopkins University

NSF Postdoctoral Fellow/J.J. Sylvester Assistant Professor

Sponsoring Scientist: Yiannis Sakellaridis

San Francisco, CA

Sept. 2025–

Vienna, Austria

Fall 2024–Spring 2025

Baltimore, MD

Fall 2021–Spring 2024

## EDUCATION

### UC Berkeley

Ph.D. in Mathematics

Advisor: Sug Woo Shin

Thesis: “Statistics of Certain Automorphic Representations through the Stable Trace Formula”

### Harvard University

A.B. in Mathematics, *magna cum laude*

Senior Thesis: “Edge Universality for Random Matrices through the Method of Steepest Descent”

Berkeley, CA

Graduated: May 2021

Cambridge, MA

Graduated: June 2015

## RESEARCH INTERESTS

- Automorphic Representations and their Applications
- Trace formulas
- Endoscopy
- Langlands program

## PUBLICATIONS/PREPRINTS

- *Ramanujan Complexes from Unitary Groups over Number Fields* (w/Alberto Mínguez and Jiandi Zou), in preparation
- *Uniform Bounds and Dualities for Asymptotics of Representations of  $p$ -adic  $GL_N$*  (w/Mathilde Gerbelli-Gauthier and Simon Marshall), 28 pages, in preparation
- *Multi-Qubit Golden Gates* (w/ Shai Evra and Ori Parzanchevski), 80 pages, preprint
- *Root Number Equidistribution for Self-Dual Automorphic Representations of  $GL_N$*  (w/Mathilde Gerbelli-Gauthier), 81 pages, submitted
- *Statistics of Cohomological Automorphic Representations on Unitary Groups via the Endoscopic Classification* (w/Mathilde Gerbelli-Gauthier), 96 pages, submitted
- *Counting Discrete, Level-1, Quaternionic Automorphic Representations on  $G_2$* , Journal of the Institute of Mathematics of Jussieu. Published online 2023:1-31
- *Sato-Tate Equidistribution for Families of Automorphic Representations through the Stable Trace Formula*, Algebra & Number Theory 16 (2022), no. 1, 59-137

## AWARDS AND FELLOWSHIPS

- NSF Postdoctoral Fellowship in Mathematics 2021
- UC Berkeley nominee for Schmidt Science Fellowship 2020
- Putnam honorable mention 2014

## TALKS

- UChicago Paris Center Conference on Arthur’s Endoscopic Classification, “Multi-Qubit Golden Gates”, Sept. 12th, 2025
- 7th Nisyros Conference: Trace Formulas, “Multi-Qubit Golden Gates”, July 19th, 2025
- Schiermonnikoog conference on Moduli Spaces and Modular Forms, “Root Number Equidistribution in the Weight Aspect for Cuspidal, Self-Dual Automorphic Representations on  $GL_N$ ”, Apr 18th 2024
- AMS sectional Special Session on Automorphic Forms and Trace Formulae, “Statistics of Cohomological Automorphic Representations on Unitary Groups”, Apr 7th 2024
- Texas/Oklahoma Reps. and Aut. Forms conference, plenary talk, “Computing Statistics of Automorphic Representations”, Oct 14th 2023
- AMS sectional Special Session on Automorphic Forms, their Arithmetic, and their Applications I, “Statistics of Cohomological Automorphic Representations and the Endoscopic Classification”, Oct 7th 2023
- Philadelphia Area NT Seminar “Applications of the Endoscopic Classification to Statistics of Cohomological Automorphic Representations on Unitary Groups”, Apr 5th 2023
- QVNTS seminar McGill University “Applications of the Endoscopic Classification to Statistics of Cohomological Automorphic Representations on Unitary Groups”, Feb 23rd 2023
- IIT Bombay “Explicit Trace Formulas and Statistics of Families of ‘Nice’ Automorphic Representations”, Jan 18th 2023
- Tata Institute for Fundamental Research “Applications of the Endoscopic Classification to Statistics of Cohomological Automorphic Representations on Unitary Groups”, Jan. 16th 2023

- Boston College Rep. Thy. Seminar “Applications of the Endoscopic Classification to Statistics of Cohomological Automorphic Representations on Unitary Groups”, Nov. 17th 2022
- Princeton/IAS NT Seminar “Applications of the Endoscopic Classification to Statistics of Cohomological Automorphic Representations on Unitary Groups”, Nov. 3rd 2022, [\[video link\]](#)
- UMD Rep. Thy. Seminar “Applications of the Endoscopic Classification to Statistics of Cohomological Automorphic Representations on Unitary Groups”, Oct. 24 2022
- CLAP I workshop on the Langlands Program “Counting level-1, quaternionic automorphic representations on  $G_2$ ”, Aug. 13th 2022
- ESI workshop Minimal Reps. and the Theta Correspondence “Counting level-1, quaternionic automorphic representations on  $G_2$ ”, Apr. 14th 2022 [\[video link\]](#)
- 45th Midwest Rep. Theory Conference “Bounding Orbital Integrals through the Metric Geometry of Bruhat-Tits buildings”, Mar 11th., 2022
- UCSD NT Seminar “Counting level-1, quaternionic automorphic representations on  $G_2$ ”, Oct 28nd, 2021
- UVA NT Seminar “Counting level-1, quaternionic automorphic representations on  $G_2$ ”, Oct 22nd, 2021
- Duke NT Seminar “Counting level-1, quaternionic automorphic representations on  $G_2$ ”, Oct 13th, 2021
- Johns Hopkins NT Seminar “Counting level-1, quaternionic automorphic representations on  $G_2$ ”, Sept. 15th, 2021
- Johns Hopkins Jr. Number Theory Days “Statistics of Aut. Reps through Simplified Trace Formulas”, Dec 4th 2020
- NUS NT/rep. thy. seminar “Statistics of Aut. Reps through Simplified Trace Formulas”, Nov 5th 2020 [\[video link\]](#)
- POINT online contributed talk series, “Statistics of Aut. Reps through Simplified Trace Formulas”, Jul 27th 2020
- CARTOON online conference, “Statistics of Aut. Reps through Simplified Trace Formulas”, May 31st 2020 [\[video link\]](#)
- UW Madison NT/rep. thy. seminar, “Statistics of Aut. Reps through the Stable Trace Formula”, Apr 9th 2020
- UC Berkeley NT/arith. geom. seminar “Statistics of Aut. Reps through the Stable Trace Formula”, Apr 6th 2020
- Stanford student arith. geom. seminar, “Equidistribution in Families of Automorphic Representations”, Apr 23rd, 2019

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## CONFERENCES ATTENDED

- UChicago Paris Center Conference on Arthur’s Endoscopic Classification (speaker), Sept. 2025
- Fields Institute Conference on the Work of James Arthur (participant), Aug. 2025
- 7th Nisyros Conference: Trace Formulas (speaker), Nisyros, July 2025
- Random Theory (participant), Estes Park, Aug. 2024
- Learning Being (participant), Eugene, Aug. 2024
- Moduli Spaces and Modular Forms (speaker), Schiermonnikoog, Apr. 2024
- AMS sectional Special Session on Automorphic Forms and Trace Formulae (speaker), Howard U., Apr 2024
- Texas/Oklahoma Rep. Thy. Conference (plenary speaker), U. of Oklahoma, Oct 2023
- AMS sectional Special Session on Aut. Forms, their Arithmetic, and their Applications I (speaker), Omaha, Oct 2023
- CMI workshop New Perspectives in the Analytic Theory of Automorphic Form (participant), Oxford, Sept 2023
- CIRM workshop Automorphic forms, endoscopy and trace formulas (participant), CIRM, Sept 2023
- Masterclass on the Relative Trace Formula (participant), U. of Copenhagen, Aug 2022
- CLAP workshop in the Langlands Program (speaker), HCM Bonn, Aug 2022
- Isaac Newton Institute workshop on Automorphic Reps. and Physics (participant), INI Cambridge, Aug 2022
- IHES summer school on the Langlands Program (participant), IHES, July 2022
- ESI workshop on Minimal Representations and the Theta Correspondence (speaker), ESI Vienna, April 2022
- 45th Midwest Representation Theory Conference (speaker), U. of Michigan, March 2022
- Arizona Winter School on Automorphic Forms beyond  $GL_n$  (participant), U. of Arizona, March 2022
- CIRM workshop on Periods, Functoriality, and  $L$ -functions, CIRM, Jan 2022
- BIRS workshop on Basic Functions, Orbital Integrals, and Beyond Endoscopy (participant), online, November 2021
- Automorphic Project and Research Seminar (participant), online, Spring 2021, Fall 2021
- Junior Number Theory Days (speaker), online, December 2020
- Paul J. Sally Jr. Midwest Representation Theory Conference (participant), online, October 2020
- CARTOON conference (speaker), online May 2020
- Arizona Winter School on Non-Abelian Chabauty (participant), U. of Arizona, March 2020
- Arizona Winter School on Topology and Arithmetic (participant), U. of Arizona, March 2019
- Endoscopy and Beyond (participant), Institute for Mathematical Sciences Singapore, December 2018-January 2019
- Arizona Winter School on Iwasawa Theory (participant), U. of Arizona, March 2018
- Arizona Winter School on Perfectoid Spaces (participant), U. of Arizona, March 2017
- Paul J. Sally Jr. Midwest Representation Theory Conference (participant), Purdue University, October 2017

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## CONFERENCES AND SEMINARS ORGANIZED

- JHU number theory seminar, Fall 2022-present
- Bay Area Graduate Math Conference (BYGMAC), UC Berkeley, May 2019  
Conference to promote interaction between grad students at various bay area schools, co-organized
- Berkeley Undergraduate Number Theory Conference, UC Berkeley, Apr 2018, Nov 2020  
Conference to introduce interested undergrads to more advanced number theory topics, co-organized

- Many Cheerful Facts graduate student colloquium, Fall 2018, Spring 2019, Fall 2019 seminar aimed at younger graduate students, co-organized
- Berkeley student number theory seminar, Fall 2018 seminar, co-organized
- Graduate student seminar on Bruhat-Tits theory, Spring 2018 learning seminar, co-organized
- Graduate student seminar on algebraic groups, Spring 2017 learning seminar, co-organized
- Mini-course on representations of  $p$ -adic groups, Spring 2016 4-lecture series

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## SERVICE

- Reviewer for IMRN, Advances in Mathematics, mathreviews
- Berkeley Math Graduate Student Association—officer (Spring 2016–Fall 2020)
- Harvard Undergraduate Council—house representative (Spring 2013–Spring 2015)
- Harvard math survey on undergraduate climate—helped with survey design (Spring 2013)

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## MENTORING

- Ben Marlin, Johns Hopkins, Spring 2024
- Aryan Dugar, Johns Hopkins, Summer 2023
- Espen Slettnes, UC Berkeley Directed Reading Program, Fall 2017
- Qiye Zhao, UC Berkeley Directed Reading Program, Spring 2016

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## TEACHING

### Johns Hopkins University

*J.J. Sylvester Assistant Prof.*

- Math 212, Honors Linear Algebra (Spring 2024)
- Math 411, Representation Theory (Fall 2023)
- Math 304, Elementary Number Theory (Fall 2022)

**Baltimore, MD**

Fall 2022-present

### University of California, Berkeley

*Graduate Student Instructor (GSI)*

- Math 104, Introduction to Analysis (Spring 2021)
- Math 254b, Class Field Theory (Spring 2020)
- Math 250b, Commutative Algebra (Spring 2020)
- Math 55, Discrete Mathematics (Spring 2019)
- Math 54, Linear Algebra and Differential Equations (Spring 2016, Spring 2018)
- Math 53, Multivariable Calculus (Fall 2016, Spring 2017)
- Math 1A, Calculus I (Fall 2015)

**Berkeley, CA**

Fall 2015- Spring 2021

### Ross Mathematics Program

*Counselor*

**Columbus, OH**

Summer 2011, 12