

Anurag Sahay

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Curriculum Vitae (last update: 2023-12-20)

Employment

Aug '23– **Golomb Visiting Assistant Professor**, Purdue University.
Mentor: Prof. Trevor Wooley.

Education

2018–2023 **Doctor of Philosophy, Mathematics**, University of Rochester (UoR).
Doctoral Adviser: Prof. Steven Gonek.

2018–2020 **Master of Arts, Mathematics**, University of Rochester.

2011–2016 **B.S.–M.S. (Dual Degree), Mathematics and Scientific Computing**,
Indian Institute of Technology, Kanpur (IITK).
Graduated with Distinction; Minors in: (1) Theory of Computing, and (2) Literature.

Research Interests

Analytic and probabilistic number theory, additive combinatorics, spectral (hyper)graph theory, discrete geometry, and applications to theoretical computer science.

Publications

1. Alex McDonald, Brian McDonald, Jonathan Passant, and Anurag Sahay, *Distinct distances from points on a circle to a generic set*, **Integers**, 21:Paper No. A55, 2021., arXiv:2005.02951.
2. Anurag Sahay, *Moments of the Hurwitz zeta function on the critical line*, **Math. Proc. Cambridge Phil. Soc.**, First View: 1–31, 2022., doi:10.1017/S0305004122000457, arxiv:2103.13542.
3. Winston Heap, Anurag Sahay, and Trevor D. Wooley, *A paucity problem associated with a shifted integer analogue of the divisor function*, **J. Number Theory**, 242:660–668, 2023., doi:10.1016/j.jnt.2022.05.006, arXiv:2108.00287.

Preprints

- Brian McDonald, Anurag Sahay, and Emmett L. Wyman, *The VC dimension of quadratic residues in finite fields*, 2022., arxiv:2210.03789.

Teaching

(at Purdue).

Spring '24 MA 35100: Elementary Linear Algebra, (*current*).

- Fall '23 MA 26500: Linear Algebra.
(as Instructor-of-Record at UofR).
- Summer '23 Math 201: Introduction to Probability.
 Spring '23 Math 165: Linear Algebra w/ Differential Equations.
 Summer '22 Math 165: Linear Algebra w/ Differential Equations.
 Spring '22 Math 143: Calculus III.
 Summer '21 Math 142: Calculus II.

Research Talks

Upcoming Talks.

- 21 Feb 2024 Joint Analytic Number Theory Seminar, Stanford University
 09 May 2024 Quebec-Vermont Number Theory Seminar

Moments of the Hurwitz zeta function on the critical line.

- 07 Oct 2023 Special Session on Analytic Number Theory and related fields, AMS Fall Central Sectional, Omaha
 04 Oct 2023 Purdue Analytic Number Theory and Harmonic Analysis (PANTHA) Seminar
 01 Apr 2023 11th Annual Upstate New York Number Theory Conference
 14 Feb 2023 Number Theory Seminar, University of Mississippi
 02 Feb 2023 Number Theory Seminar, UC Irvine
 11 Nov 2022 Program on Number Theory and Physics, Simons Center for Geometry and Physics
 02 Nov 2022 Algebra/Number Theory Seminar, University of Rochester
 29 July 2022 PIMS CRG Workshop on Moments of L -functions, University of Northern British Columbia
 27 May 2022 CANT 2022 (Combinatorial and Additive Number Theory)
 02 Apr 2022 47th Annual New York State Regional Graduate Mathematics Conference, Syracuse
 28 Mar 2022 Graduate Number Theory Seminar, Rutgers University
 23 Mar 2022 Number Theory Seminar, Duke University
 18 Mar 2022 Graduate Students' Seminar, University of Rochester

The VC-dimension of quadratic residues in finite fields.

- 23 May 2023 CANT 2023 (Combinatorial and Additive Number Theory)
 18 Mar 2023 Special Session on Discrete Analysis, AMS Spring Southeastern Sectional, Atlanta
 04 Jan 2023 AMS Contributed Paper Session, Joint Mathematical Meetings, Boston
 18 Nov 2022 Discrete Math and Combinatorics Seminar, University of South Carolina

The value distribution of the Hurwitz zeta function with irrational shifts.

- 01 Dec 2022 Weekly Seminar, PIMS CRG on L -functions in Analytic Number Theory

Expository Talks

- 21 Apr 2021 **The Distribution of Values of $\zeta(s)$ inside the Critical Strip.**
 London Analytic Number Theory Study Group
- 04 Dec 2020 **Discrepancy Bounds for the Riemann Zeta Function.**
 Oral Exam, University of Rochester

27 Feb 2020 **The Zig-Zag Product and Reingold's Theorem.**

Combinatorics Seminar, University of Rochester

25 Feb 2020 **A Crash Course in Complexity Theory with a view towards $\text{ustcon} \in L$.**

Combinatorics Seminar, University of Rochester

Undergraduate/High School Mentoring

Mentor Network, *Association for Women in Mathematics.*

Sep'23– Carol Wu.

Guided Reading Program, *AMS Grad Student Chapter, UofR.*

Sep'22–Jul'23 Alhussein Khalil, *Roth's theorem on arithmetic progressions.*

Feb'22–Aug'22 Tran Duy Anh Le, *Introduction to analytic number theory.*

Oct'20–May'21 Zhengkai Li, *Introduction to analytic number theory.*

She is now a Math PhD student at University of Washington

Joint Mentorship Program, *AMS Grad Student Chapter & SUMS, UofR.*

Oct'19–Jan'20 Peter Dragos.

Journal Refereeing

- Int. J. Number Theory
- Math. Proc. Cambridge Philos. Soc.

Research Visits

22-26 Jan '23 **American Institute of Mathematics (AIM).**

(*upcoming*) Visit funded by a SQuaRE grant.

07-16 Nov '22 **Simons Center for Geometry and Physics (SCGP).**

Visit funded by the SCGP Program on Number Theory and Physics.

23-27 Aug '21 **American Institute of Mathematics (AIM).**

Visit funded by NSF FRG on L-functions and Arithmetic Stratification (DMS-1854398).

Conferences, Workshops, Research Schools, etc

16-20 Oct '23 AIM Workshop: Delta symbols and the subconvexity problem

07-08 Oct '23 ‡AMS Fall Central Sectional Meeting, Creighton University, Omaha

23-26 May '23 †Combinatorial and Additive Number Theory, 2023*

01-02 Apr '23 †11th Annual Upstate New York Number Theory Conference, Rochester

18-19 Mar '23 †AMS Spring Southeastern Sectional Meeting, GeorgiaTech, Atlanta

04-07 Jan '23 †Joint Mathematical Meetings, Boston

18-20 Nov '22 BIRS Workshop: L -functions in Analytic Number Theory*

24-28 Oct '22 SCGP Workshop: Number Theory and Physics, Stony Brook

01-04 Aug '22 ANTeater '22, UC Irvine

25-29 Jul '22 †PIMS CRG Workshop on Moments of L-functions*

- 21-24 Jun '22 50 Years of Number Theory and Random Matrix Theory, IAS, Princeton
- 24-27 May '22 †Combinatorial and Additive Number Theory, 2022*
- 02 Apr '22 †47th Annual NYS Regional Graduate Mathematics Conference, Syracuse
- 06-10 Dec '21 AIM Workshop: Spectral graph and hypergraph theory*
- Apr '21-Jun '21 ‡London Analytic Number Theory Study Group*
- 07-17 Jun '21 Summer School: Polynomial Methods, HIM, Bonn*
- 24-28 May '21 UNCG Summer School: Applications of Expander Graphs to Number Theory and Computer Science*
- 10-21 May '21 Hausdorff School: The Circle Method, HIM, Bonn*
- 17-18 Apr '21 AMS Spring Central Sectional Meeting*
- 03-04 Oct '20 AMS Fall Eastern Sectional Meeting*
- 09-23 Jul '14 École d'été: Théorie analytique des nombres, IHÉS, France
- † – contributed talk, ‡ – invited talk
- * – online

Service

- 2023– **Reviewer for Math. Reviews, MathSciNet.**
American Mathematical Society
- 2023– **Co-organizer, PANTHA Seminar, Purdue University.**
(Purdue Analytic Number Theory And Harmonic Analysis)
- 2021–2024 **Organizer, FRG Grad Seminar, American Institute of Mathematics.**
NSF FRG on L-functions and Arithmetic Stratification (DMS-1854398)
- 2019–2022 **Grad Student Member, Board on Academic Honesty.**
College of Arts, Sciences & Engineering; University of Rochester
- 2019–2020 **Math Department Representative, Graduate Students' Association.**
College of Arts, Sciences & Engineering; University of Rochester
- 2012–2015 **Students' Senate Nominee, Senate Undergraduate Committee.**
Indian Institute of Technology, Kanpur
- 2014–2015 **Chairperson, Students' Senate.**
Indian Institute of Technology, Kanpur

Awards, Scholarships, Fellowships, and Grants

- 2024–2026 **SQuaRE Grant, American Institute of Mathematics.**
(joint with Gilyoung Cheong, Alexandra Florea, Matilde Lalín, and Amita Malik)
- 2023 **JMM Graduate Student Travel Grant, American Mathematical Society.**
- 2022 & 2023 **Dean's Teaching Fellowship, AS&E, UofR.**
Fellowship for teaching a course as instructor-of-record during a regular semester.
- 2016 **Ratan Swarup Memorial Prize, IITK.**
Best all round undergraduate student graduating at the Convocation of IIT Kanpur
- 2016 **IIT Kanpur Excellence Award for Leadership in Students' Affairs.**

- 2014 **Prof. J.N. Kapur Prize**, *Department of Mathematics and Statistics, IITK.*
Best student among 3rd year undergrads and 1st year Masters in the department
- 2014 **Academic Excellence Award**, *Senate Scholarships and Prizes Committee, IITK.*
- 2013 **Summer Research Fellowship**, *Indian Science Academies.*
Awarded by IASc, Bangalore; INSA, Delhi; and NASI, Allahabad to do a project under the guidance of Prof. R. Balasubramanian and Prof. Sanoli Gun at the IMSc, Chennai
- 2011 **Kishore Vaigyanik Protsahan Yojana (KVPY) SX Fellowship**, *IISc Bangalore.*
- 2008 **NTSE Scholarship**, *National Council of Educational Research and Training.*

Non-academic Work Experience

- Sep '16– **Boston Consulting Group**, *Gurgaon, Haryana, India.*
Sep '17 Associate
- May '15– **Deutsche Bank (DB Centre)**, *Mumbai, Maharashtra, India.*
Jul '15 Summer Analyst