

Arindam Roy

Curriculum Vitae

Department of Mathematics and Statistics
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Charlotte, NC 28223

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Professional Employment

University of North Carolina at Charlotte <i>Assistant Professor</i>	Charlotte, U.S.A. 2018-present
Rice University <i>G. C. Evans Instructor</i>	Houston, U.S.A. 2015-2018

Education

University of Illinois at Urbana-Champaign <i>Ph.D., Mathematics, Thesis advisor: Alexandru Zaharescu</i>	Urbana, U.S.A. 2009-2015
University of Texas at Pan-American <i>M.S., Mathematics, Thesis advisor: Arunava Mukherjea</i>	Edinburgh, U.S.A. 2008-2009
University of Calcutta <i>M.Sc., Mathematics</i>	Kolkata, India 2005
University of Calcutta <i>B.Sc., Mathematics</i>	Kolkata, India 2003

Research Interests

Number Theory: L -functions and the distribution of their zeros, divisor and circle problems, summation formula of arithmetic functions, mean value of multiplicative functions, partition of integers, quasiprime race.

Special Functions: Integral transforms, hypergeometric functions, Bessel functions and their application to mathematical finance.

Graph Theory: Zeta functions, prime graph theorem.

Publications

Under Review:(**Student co-authors*)

- (6) Crim, Jacob*; Frenreiss, William*; **Roy Arindam** Global Behavior of the Value Distributions of Riemann Zeta-Function Approximations, submitted for review
- (5) Banerjee, Debika; **Roy, Arindam** Asymptotic of plane overpartition with explicit error terms, submitted for review
- (4) **Roy, Arindam**; Sahoo, Jagannath; Vatwani, Akshaa Functional equation and arithmetical identities for a class of L -functions, submitted for review

- (3) Benfield, Brennan*; Lippard, Oliver*; **Roy, Arindam** End behaviors of Ramanujan's taxicab numbers, submitted for review
- (2) Luo, Ye; **Roy, Arindam** Spectral antisymmetry of twisted graph adjacency, submitted for review
- (1) Benfield, Brennan*; **Roy, Arindam** Log concavity and the multiplicative properties of restricted partition functions, provisionally accepted in Annals of Combinatorics

Published:(**Student co-authors*)

- (24) Mazumdar, Eshita; **Roy, Arindam** Product of polynomial values being large power, accepted in Proceedings of the Edinburgh Mathematical Society
- (23) Benfield, Brennan*; Paul, Madhumita*; **Roy, Arindam** Turán inequalities for k -th power partition functions. *J. Math. Anal. Appl.* 529 (2024), no 1
- (22) **Roy, Arindam**; Steve Wainaina* a -Points of partial sums of the Riemann zeta function. *J. Math. Sci. (N.Y.)* 270(2023), no. 6, Problems in mathematical analysis. vol. 270, No. 6.
- (21) Robles, Nicolas; **Roy, Arindam** Unexpected average values of generalized von Mangoldt functions in residue classes. *J. Aust. Math. Soc.* 111 (2021), no. 1, 127–144.
- (20) **Roy, Arindam**; Vatwani, Akshaa Zeros of Dirichlet polynomials. *Trans. Amer. Math. Soc.* 374 (2021), no. 1, 643–661.
- (19) Dixit, Atul; **Roy, Arindam** Analogue of a Fock-type integral arising from electromagnetism and its applications in number theory. *Res. Math. Sci.* 7 (2020), no. 3, Paper No. 25, 33 pp.
- (18) Malik, Amita; **Roy, Arindam** On the distribution of zeros of derivatives of the Riemann ξ -function. *Forum Math.* 32 (2020), no. 1, 1–22.
- (17) **Roy, Arindam**; Vatwani, Akshaa Zeros of partial sums of L-functions. *Adv. Math.* 346 (2019), 467–509.
- (16) Li, Junxian; Nastasescu, Maria; **Roy, Arindam**; Zaharescu, Alexandru Smooth L2 distances and zeros of approximations of Dedekind zeta functions. *Manuscripta Math.* 154 (2017), no. 1-2, 195–223.
- (15) Robles, Nicolas; **Roy, Arindam** Moments of averages of generalized Ramanujan sums. *Monatsh. Math.* 182 (2017), no. 2, 433–461.
- (14) Dixit, Atul; **Roy, Arindam**; Zaharescu, Alexandru Error functions, Mordell integrals and an integral analogue of a partial theta function. *Acta Arith.* 177 (2017), no. 1, 1–37.
- (13) Berndt, Bruce C.; Dixit, Atul; **Roy, Arindam**; Zaharescu, Alexandru New pathways and connections in number theory and analysis motivated by two incorrect claims of Ramanujan. *Adv. Math.* 304 (2017), 809–929.
- (12) Li, Junxian; **Roy, Arindam**; Zaharescu, Alexandru Zeros of a family of approximations of Hecke L-functions associated with cusp forms. *Ramanujan J.* 41 (2016), no. 1-3, 391–419.
- (11) **Roy, Arindam**; Zaharescu, Alexandru; Zaki, Mohammad Some identities involving convolutions of Dirichlet characters and the Möbius function. *Proc. Indian Acad. Sci. Math. Sci.* 126 (2016), no. 1, 21–33.
- (10) Dixit, Atul; Robles, Nicolas; **Roy, Arindam**; Zaharescu, Alexandru Koshliakov kernel and identities involving the Riemann zeta function. *J. Math. Anal. Appl.* 435 (2016), no. 2, 1107–1128.

- (9) Dixit, Atul; **Roy, Arindam**; Zaharescu, Alexandru Riesz-type criteria and theta transformation analogues. *J. Number Theory* 160 (2016), 385–408.
- (8) Robles, Nicolas; **Roy, Arindam**; Zaharescu, Alexandru Twisted second moments of the Riemann zeta-function and applications. *J. Math. Anal. Appl.* 434 (2016), no. 1, 271–314.
- (7) Kühn, Patrick; Robles, Nicolas; **Roy, Arindam** On a class of functions that satisfies explicit formulae involving the Möbius function. *Ramanujan J.* 38 (2015), no. 2, 383–422.
- (6) Dixit, Atul; **Roy, Arindam**; Zaharescu, Alexandru Ramanujan-Hardy-Littlewood-Riesz phenomena for Hecke forms. *J. Math. Anal. Appl.* 426 (2015), no. 1, 594–611.
- (5) Dixit, Atul; Robles, Nicolas; **Roy, Arindam**; Zaharescu, Alexandru Zeros of combinations of the Riemann ξ -function on bounded vertical shifts. *J. Number Theory* 149 (2015), 404–434.
- (4) Ledoan, Andrew; **Roy, Arindam**; Zaharescu, Alexandru Zeros of partial sums of the Dedekind zeta function of a cyclotomic field. *J. Number Theory* 136 (2014), 118–133.
- (3) Dixit, Atul; **Roy, Arindam**; Zaharescu, Alexandru Monotonicity results for Dirichlet L-functions. *J. Math. Anal. Appl.* 410 (2014), no. 1, 307–315.
- (2) Laugesen, Richard S.; Liang, Jian; **Roy, Arindam** Sums of magnetic eigenvalues are maximal on rotationally symmetric domains. *Ann. Henri Poincaré* 13 (2012), no. 4, 731–750.
- (1) Dixit, Atul; **Roy, Arindam**; Zaharescu, Alexandru Convexity of quotients of theta functions. *J. Math. Anal. Appl.* 386 (2012), no. 1, 319–331.

PhD Thesis:

- (1) **Roy, Arindam** Ramanujan’s identities, Voronoi summation formula, and zeros of partial sums of zeta and L-functions. Thesis (Ph.D.)—University of Illinois at Urbana-Champaign. 2015. 142 pp. ISBN: 978-1339-32663-4, ProQuest LLC.

Grant Activities

UNCC Faculty Research Grant <i>Awarded amount</i> \$8000	<i>2019–2020</i>
AMS-Simons Travel Grant <i>Awarded amount</i> \$4000	<i>2015–2018</i>

Conference Specific Grants

- Graduate Student Travel Grant for Joint Math Meeting, Baltimore	<i>Spring 2014</i>
- Graduate Student Travel Grant for AMS Sectional Meeting, Lubbock	<i>Spring 2014</i>
- Graduate Student Travel Grant for AMS Sectional Meeting, Tucson	<i>Fall 2012</i>

Awards and Honors

- Bateman Prize in Number Theory	<i>2015–2016</i>
- Bateman Fellowship in Number Theory	<i>2014–2015</i>
- Hohn/Nash Fellowship and Hack Fellowship	<i>2012–2013</i>
- Appeared on ‘the List of Teachers Ranked as Excellent by their Students’	<i>Summer 2012</i>
- Appeared on ‘the List of Teachers Ranked as Excellent by their Students’	<i>Fall 2010</i>

- Gold medalist from Calcutta University for rank first in B.Sc (Math Honors) 2003

Committee Services

- Director of Math honors program *Fall 2023-current*
- Served in MATH 1102 committee, part of QEP *2022-2023*
- Participate STEM academy *Fall 2023*
- Colloquium organizing committee *Fall 2022-present*
- High School Math Contest Exam Committee *Fall 2018-Current*
- GTAs Mentor *Fall 2018-Spring 2021*
- Graduate Curriculum Committee *Fall 2021-Current*
- Algebra Qualifying Exam Committee *Fall 2019-Current*

External Services

- Served as referee for 25 research articles in reputed international journals
 - Proceedings of the Royal Society of Edinburgh, Series A (1)
 - Proceedings of American Mathematical Society (1)
 - Revista de la Real Academia de Ciencias Exactas, Físicas y Naturales. Serie A. Matemáticas (1)
 - Advances in Mathematics (1)
 - Transaction of American Mathematical Society (1)
 - Publication Matématiques (1)
 - Bulletin of the London Mathematical Society (3)
 - Journal of Mathematical Analysis and Applications (4)
 - Ramanujan Journal (1)
 - Monatshefte für Mathematik (2)
 - Journal of Number Theory (2)
 - International Journal of Number Theory (2)
 - International Journal of Number Theory (2)
 - Advances in Applied Mathematics (1)
 - Czechoslovak Mathematical Journal (1)
 - Canadian Mathematical Bulletin (1)
 - Canadian Journal of Mathematics (1)
 - Proceeding of Royal Society Edinburgh (1)
 - The Rocky Mountain Journal of Mathematics (1)
- Served in PhD thesis committee
 - PhD thesis committee member of Eun Hye Lee, University of Illinois , Chicago*
- Reviewer of Austrian Science Fund (FWF)
 - Reviewed two proposals submitted to FWF Austrian Science Fund for funding*

Other Services

- Co-organizer of the Math colloquium 2016-2017
Rice University
- Co-organizer of the Algebraic Geometry and Number Theory seminar 2016-2017
Rice University
- Instructor of the Current Mathematics Seminar 2015-2016
Rice University
- Initiator and Co-organizer of the Graduate Student Number Theory Seminar 2014-2015
University of Illinois at Urbana-Champaign

Mentoring

- PhD Advisor - In Progress
Project: Asymptotic of power overpartition
UNCC
Student: Hannah Powell
- Advisor at Math Research at UNC Charlotte (MRC-REU) - Summer 2023
Project: On the zeros of partial sums of Riemann zeta-function
UNCC
Student: Kevin You and Valerii Dabagian
- Advisor at Math Research at UNC Charlotte (MRC-REU) - Summer 2022
Project: Global Behavior of the Value distributions of Riemann zeta-function
UNCC
Student: Jacob Crim and William Frensdreiss
- Advisor of Undergraduate Honors Thesis - Fall 2021 -Spring 2022
Project: a -points of partial sums of the Riemann zeta functions
UNCC
Student: Steve Wainaina
- Advisor of Undergraduate Honors Thesis - Fall 2020 -Spring 2021
Project: Consecutive Bias of Quasi Primes
UNCC
Student: Jacob Ferrier
- Advisor of Master Thesis - Spring 2019-Spring 2020
Project: Log Concavity of Power Partitions
UNCC
Student: Brennan Benfield
- Mentor of Undergraduate Senior Project - Fall 2019
Project: Ford Circles
UNCC
Student: Parker Deaton
- Director and co-founder of the Rice Geometry Lab - Spring 2017-Spring 2018
A unique research opportunity for undergraduates
Rice University
Managing, Organizing, and coordinating the projects and the lab

- Project Mentor at the Rice Geometry Lab -
Mentoring five undergraduates *Fall 2017-Spring 2018*
Rice University
Project: Music and Geometry.
- Instructor of the Math Undergraduate Research *Summer 2016*
Rice University, Student - Tommy Stasko
Project: Zeros of derivatives of The Riemann zeta-function.
- Graduate Mentor at the Illinois Geometry Lab *Fall 2013*
Mentored three undergraduates
University of Illinois at Urbana-Champaign
Project: Angular Distribution of Hyperbolic Lattice Points.

Conference Talks (International and Domestic)

- Strong Asymptotic of Plane Overpartitions *Fall 2023*
Fall Southeastern Sectional Meeting, Mobile
- Rice Geometry Labs *Spring 2019*
Joint Mathematics Meetings, Baltimore
- Zeros of partial sums of L -functions *Fall 2018*
Palmetto Number Theory Series 31, USC Columbia
- Unnormalized differences of the zeros of the derivative of the completed L -functions *Spring 2018*
International Conference on Mathematics and Statistics (ICOMAS 2018), Memphis
- On the distribution of imaginary parts of zeros of derivatives of
the Riemann ξ -function *Summer 2017*
Mathematical Congress of The Americas, Montréal
- Moments of the average of a generalized Ramanujan sum *Spring 2015*
Joint Mathematics Meeting, San Antonio
- Zeros of partial sums of the Dedekind zeta function of a Galois Extension *Fall 2014*
Central Fall Sectional Meeting, UW-Eau Claire
- Zeros of partial sums of the Dedekind zeta function of a Galois Extension *Summer 2014*
Midwest Number Theory conference for Graduate Students 2014, UIUC
- Generalization of Ramanujan's double Bessel function series identities *Spring 2014*
Spring Central Sectional Meeting, TTU - Lubbock
- Zeros of partial sums of the Dedekind zeta function of a cyclotomic field *Spring 2014*
Joint Mathematics Meetings, Baltimore
- Ramanujan-Hardy-Littlewood-Riesz type phenomena for Hecke forms *Spring 2013*
Joint Mathematics Meetings, San Diego
- Ramanujan-Hardy-Littlewood-Riesz type phenomena for Hecke forms *Fall 2012*
Midwest Number Theory conference for Graduate Students 2012, UIUC
- Convexity of Quotients of Theta Functions *Fall 2011*
Midwest Number Theory conference for Graduate Students 2011, UW-Madison

Seminar and Colloquium Talks (International and Domestic)

- a -values of a family of approximations for a class of L -functions *Fall 2023*
Number Theory Seminar, UTRG

- Polynomial Values Being High Power *Spring 2021*
Number Theory Seminar, TTU-Lubbock
- Theory of Partition *Fall 2019*
ANT Seminar, UNC-Charlotte
- Ford Circles *Fall 2017*
Undergraduate Colloquium, Rice University
- Unnormalized differences of the zeros of the derivative of
the completed L -function *Fall 2017*
AGNT Seminar, Rice University
- Unnormalized differences and fractional parts of zeros of the derivative of
the Riemann ξ function *Summer 2017*
Number Theory Seminar, Queen's University
- Unnormalized differences and fractional parts of zeros of the derivative of
the Riemann ξ function *Summer 2017*
Number Theory Seminar, ISI Kolkata
- Zeros of the Riemann zeta-function on the critical line *Fall 2015*
AGNT Seminar, Rice University
- Moments of the average of a generalized Ramanujan sum *Spring 2015*
Number Theory Seminar, University of Rochester
- Moments of the average of a generalized Ramanujan sum *Fall 2014*
Number Theory Seminar, University of Zurich
- Zeros of partial sums of the Dedekind zeta function of a cyclotomic field *Fall 2013*
Number Theory Seminar, University of Zurich
- Zeros of Derivatives of the L -functions associated with the cusp forms *Summer 2013*
Mini Research Experience for Graduate Students, UI-Urbana-Champaign
- Zeros of partial sums of the Dedekind zeta function of a cyclotomic field *Summer 2013*
Mini Research Experience for Graduate Students, UI-Urbana-Champaign
- Convexity of Quotients of Theta Functions *Fall 2011*
Number Theory Seminar, UI-Urbana-Champaign

Conferene Organizing

- Co-organizer of the COmbinatorial Number Theory And Connected Topics III *2024*
Online
- Co-organizer of the COmbinatorial Number Theory And Connected Topics II *2023*
Online
- Organizer of the Palmetto Number Theory Series 32 *Fall 2022*
UNC-Charlotte
- Co-organizer of the COmbinatorial Number Theory And Connected Topics I *2021*
Online
- Co-organizer of the AMS special session Counting method in Number Theory *Spring 2019*
JMM, Baltimore
- Organizer of the Palmetto Number Theory Series 32 *Fall 2019*
UNC-Charlotte
- Co-organizer of the Palmetto Joint Arithmetic, Modularity, and Analysis Series (I) *Fall 2020*
Online

- Co-organizer of the Palmetto Joint Arithmetic, Modularity, and Analysis Series (II) *Fall 2020*
Online
- Co-organizer of the October Math Day Symposium at UNC Charlotte *Fall 2020*
Online

Workshops

- Connections for Women: Analytic Number Theory *Spring 2017*
MSRI, Berkeley
- Introductory Workshop: Analytic Number Theory *Spring 2017*
MSRI, Berkeley
- Recent developments in Analytic Number Theory *Spring 2017*
MSRI, Berkeley

Teaching Experience

University of North Carolina at Charlotte

- Junior Honors Seminar *Spring 2024*
- Topics in Math *Spring 2024*
- Intro to Mathematical Thinking *Fall 2023*
- *Spring 2022*
- *Summer 2022, 2023, 2024*
- Calculus I *Summer 2021*
- Complex Analysis *Spring 2021*
- Calculus II *Summer 2020, Fall 2023*
- Number Theory *Spring 2020, 2022, 2024*
- Calculus III *Summer 2019, Summer 2021, Fall 2022*
- Intro to Modern Algebra *Spring 2019*
- Matrices and Linear Algebra *Fall 2018, 2019, 2021*
- *Spring 2020, 2021, 2022, 2023*
- *Summer 2019, 2020*
- Independent Study in Mathematics
- Doctoral Research and Reading

Rice University

- Topics in Complex Analysis (Graduate Course) *Fall 2017*
 - Analytic Number Theory and Elliptic Functions
- Calculus on Manifolds *Spring 2017, 2018*
- Topics in Complex Analysis (Graduate Course) *Fall 2016*
 - Analytic Number Theory
- Complex Analysis *Spring 2016*
- Number Theory *Fall 2015*
- Calculus II *Spring 2016, 2017, 2018*

- Included active learning component in every class. *Summer 2016*
- Calculus I *Summer 2017*
- Included active learning component in every class.

University of Illinois at Urbana-Champaign

- Calculus III (*Full Instructor*) *Summer 2010, 2011 and 2012*
 - Prepared syllabus, lectures, exams, and homework.
 - Included active learning component in every class.
 - Used instructional technology.

- Calculus III with Mathematica(*Full Instructor*) *Fall 2011, Spring 2012*
 - Used Mathematica to enhanced pedagogical approach.
 - Developed curriculum.

- A Mathematical World(*Full Instructor*) *Spring 2011*
 - Taught students who are taking their only math course.
 - Explained challenging concepts using experiments.

- Calculus III (*Teaching Assistant*) *Fall 2010*
 - Prepared worksheets and engaged students in group work.

- Differential Equations (*Teaching Assistant* at NetMath) *Summer 2013, Fall 2013,
Spring 2014, Summer 2014*
 - Provided one-on-one mentoring to help students understand the lecture materials.
 - Prepared homework and exams.

- Differential Equations (*Grader*) *Fall 2009, Spring 2010*

- Applied Linear Algebra (*Grader*) *Fall 2009, Spring 2010*

- Modern Euclidean Geometry (*Grader*) *Fall 2009*

University of Texas at Pan-American

- College Algebra (*Full Instructor*) *Fall 2008, Spring 2009*
 - Prepared syllabus, lectures, exams, and home works.
 - Provided interactive learning method.

- Intermediate Algebra (*Full Instructor*) *Spring 2008*
 - Prepared syllabus, lectures, exams, and home works.
 - Provided interactive learning method.

Professional Memberships

American Mathematical Society