

# Arindam Roy

## Curriculum Vitae

Department of Mathematics and Statistics  
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### Professional Employment

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

### Education

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

### Research Interests

**Number Theory:**  $L$ -functions and the distribution of their zeros, divisor and circle problems.

**Special Functions:** Integral transforms, hypergeometric functions, and Bessel functions.

**Graph Theory:** Zeta functions.

### Publications and Preprints

- (22) Zeros of Dirichlet Polynomials (tentative title)(with A. Vatwani), in preparation.
- (21) Unnormalized differences of the zeros of the first derivative of completed  $L$ -functions, preprint.
- (20) Summation formulas involving products of Bessel functions (with A. Dixit), preprint.
- (19) Unexpected average value of generalized von Mangoldt functions in residue classes (with N. M. Robles), submitted.
- (18) On the distribution of zeros of derivatives of the Riemann  $\xi$ -function (with A. Malik), under revision in Forum Math.
- (17) Zeros of partial sums of  $L$ -functions (with A. Vatwani), accepted for publication in Advances in Mathematics.
- (16) Moments of averages of generalized Ramanujan sums (with N. M. Robles), Monatsh. Math. 182 (2017), no. 2, 433–461.
- (15) New pathways and connections in number theory and analysis motivated by two incorrect claims of Ramanujan (with B. C. Berndt, A. Dixit and A. Zaharescu), Adv. Math. 304 (2017), 809–929.

- (14) Smooth  $L^2$  distances and zeros of approximations of Dedekind zeta functions (with J. Li, M. Nastasescu and A. Zaharescu), *Manuscripta Math.* 154 (2017), no. 1–2, 195–223.
- (13) Error functions, Mordell integrals and an integral analogue of partial theta function (with A. Dixit and A. Zaharescu), *Acta Arith.* 177 (2017), no. 1, 1–37.
- (12) Zeros of a family of approximations of Hecke  $L$ -functions associated with cusp forms (with J. Li and A. Zaharescu), *Ramanujan J.* 41 (2016), no. 1–3, 391–419.
- (11) Some identities involving convolutions of Dirichlet characters and the Möbius functions (with M. Zaki and A. Zaharescu), *Proc. Indian Acad. Sci. Math. Sci.* 126 (2016), no. 1, 21–33.
- (10) Koshliakov kernel and identities involving the Riemann zeta-function (with N. M. Robles, A. Dixit and A. Zaharescu), *J. Math. Anal. Appl.* 435 (2016) 1107–1128.
- (9) Riesz-type criteria and theta transformation analogues (with A. Dixit and A. Zaharescu), *J. Number Theory* 160 (2016), 385–408.
- (8) Twisted second moments of the Riemann zeta-function and applications (with N. M. Robles and A. Zaharescu), *J. Math. Anal. Appl.* 434 (2016), no. 1, 271 – 314.
- (7) Ramanujan-Hardy-Littlewood-Riesz Type Phenomena for Hecke Forms (with A. Dixit and A. Zaharescu), *J. Math. Anal. Appl.*, 426 No 1, (2015), 594–611.
- (6) Zeros of combinations of the Riemann  $\xi(s)$  on bounded vertical shifts (with A. Dixit, N. Robles and A. Zaharescu), *J. Number Theory*, 149 (2015), 404–434.
- (5) On a class of functions that satisfies Ramanujan’s explicit formula (with P. Kuhn and N. Robles), *Ramanujan J.* 38 (2015), no. 2, 383–422.
- (4) Zeros of partial sums of the Dedekind zeta function of a cyclotomic field (with A. Ledoan and A. Zaharescu), *J. Number Theory*, 136 (2014), 118–133.
- (3) Monotonicity Results for Dirichlet  $L$ -Functions (with A. Dixit and A. Zaharescu), *J. Math. Anal. Appl.*, 410 No 1, (2014), 307–315.
- (2) Sums of magnetic eigenvalues are maximal on rotationally symmetric domains (with R. S. Laugesen and J. Liang), *Ann. Henri Poincaré*, 13 (2012), 731–750.
- (1) Convexity of Quotients of Theta Functions (with A. Dixit and A. Zaharescu), *J. Math. Anal. Appl.*, 386 No 1, (2012), 319–331.
- (0) 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

## Grants

|   |                  |
|---|------------------|
| UNCC Faculty Research Grant<br><i>Awarded amount \$8000</i> | <i>2019–2020</i> |
| AMS-Simons Travel Grant<br><i>Awarded amount \$4000</i>     | <i>2015–2018</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) | <i>2003</i>        |

### Conference Specific Grants

- Graduate Student Travel Grant for Joint Math Meeting, Baltimore *Spring 2014*
- Graduate Student Travel Grant for AMS Sectional Meeting, Lubbock *Spring 2014*
- Graduate Student Travel Grant for AMS Sectional Meeting, Tucson *Fall 2012*

### Conference Talks

- 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  $\xi$ -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

- 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  $\xi$  function *Summer 2017*  
*Number Theory Seminar, Queen's University*
- Unnormalized differences and fractional parts of zeros of the derivative of the Riemann  $\xi$  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*

## Mentoring

- Director and co-founder of the Rice Geometry Lab -  
A unique research opportunity for undergraduates *Spring 2017-present*  
*Rice University*  
Managing, Organizing, and coordinating the projects and the lab
- Project Mentor at the Rice Geometry Lab -  
Mentoring five undergraduates *Fall 2017-present*  
*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-funciton.
- 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.

## Academic Service

- Co-organizer of the Math colloquium *Fall 2016-present*  
*Rice University*
- Co-organizer of the Algebraic Geometry  
and Number Theory seminar *Fall 2016-Spring 2017*  
*Rice University*
- Instructor of the Current Mathematics Seminar *Fall 2015-Spring 2016*  
*Rice University*
- Initiator and Co-organizer of the Graduate Student  
Number Theory Seminar *Fall 2014-Spring 2105*  
*University of Illinois at Urbana-Champaign*
- Served as referee for more than 10 articles in *Publication Matemàtiques*,  
*Bulletin of the London Mathematical Society*,  
*Journal of Mathematical Analysis and Applications*, *Ramanujan Journal*,  
*Monatshefte für Mathematik*, *Journal of Number Theory*  
*Advances in Applied Mathematics*

## Teaching Experience

### University of North Carolina at Charlotte

Intro to Modern ALgebra

*Spring 2019*

Matrices and Linear Algebra

*Fall 2018*

## 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.