

Debanjana Kundu

Curriculum Vitae

PERSONAL DETAILS

Birth January 6, 1993
Address Department of Mathematics, University of Toronto
Phone (+1) 437-344-2592
Mail dkundu@math.toronto.edu

EDUCATION

Class X 2008
CBSE (India)
98.6% (Mathematics 99, Science 99, English 93)

Class XII 2010
CBSE (India)
93.2% (Mathematics 98, Chemistry 95, Physics 91, English 94)
(Top 1% in both class X and class XII.)

BS-MS Dual Degree 2010-2015
Indian Institute of Science Education and Research, Mohali, India
CGPA 9.7

MA PhD 2015-present
University of Toronto, Toronto, Canada

EMPLOYMENT

Université de Montréal Fall 2020
CRM-ISM PostDoc, Thematic Program: Cohomology in Arithmetic

University of British Columbia, Vancouver starting January 2021
PIMS PostDoc Fellow

PUBLICATIONS/ PREPRINTS

1. Perfect Powers that are Sums of Squares of an AP (with V. Patel)
pre-print available on arXiv, submitted
2. Growth of Fine Selmer Groups in Infinite Towers
Accepted for publication (Canadian Mathematics Bulletin)
3. Growth of p -Fine Selmer Groups and p -Fine Shafarevich-Tate Group in $\mathbb{Z}/p\mathbb{Z}$ -Extensions
pre-print available upon request, submitted

4. On the Relation between Classical Iwasawa $\mu = 0$ Conjecture and Coates-Sujatha Conjecture A
pre-print available upon request, submitted
5. On an Analogue of Kida's Formula for Fine Selmer Groups
pre-print available upon request, submitted
6. Structure of Fine Selmer Groups in p -adic Lie Extensions (with R. Sujatha)
pre-print available upon request, submitted
7. Pseudonullity Conjectures over the False-Tate Curve Extension (with R. Sujatha)
in progress
8. Beyond Endoscopy via Trace Formula for $GL(2, F)$ (with M. Emory, M. Espinosa-Lara, T.A. Wong) *in progress*

FELLOWSHIPS

INSPIRE Fellowship <i>Department of Science and Technology, Government of India</i>	2010-2015
JNCASR Summer Fellowship <i>JNCASR, India</i>	2012
DAAD WISE Scholarship <i>Germany</i>	2013
IAS Summer Fellowship (not availed) <i>Indian Academy of Sciences, India</i>	2013
MITACS Globalink Research Internship <i>Canada</i>	2014
Rhodes Scholarship finalist (top 18) <i>Oxford University, UK</i>	class of 2015
TIFR VSRP Fellowship <i>TIFR, India</i>	2015
BIGS Scholarship for Graduate Studies (not availed) <i>Hausdorff Center for Mathematics, Bonn, Germany</i>	2015-2018
MITACS Graduate Fellowship <i>Canada</i>	2015 - 2018
Vivekananda Graduate Award for International Students <i>University of Toronto</i>	2018 - 2019
General Motors Women in Mathematics and Science Award <i>University of Toronto</i>	2019 - 2020

CRM-ISM Postdoctoral Fellowship*Université de Montréal*

Fall 2019

PIMS Postdoctoral Fellowship*University of British Columbia, Vancouver*

2021-2022

SEMINARS**Introduction to Game Theory***Mathematics Club, IISER Mohali*

Aug 2012

27 Lines on a Cubic*Department Colloquium, IISER Mohali*

Nov 2013

Proofs of Quadratic Reciprocity*Department Colloquium, IISER Mohali*

April 2014

Linear Groups- Malcev's Theorem and Selberg's Lemma*IISER Mohali*

April 2014

Principal L-Functions of the Linear Group*Department of Math, University of Toronto*

August 2016

Understanding the Rank Distribution Conjecture*Graduate Seminar, Department of Math, University of Toronto*

Nov 2016

What is an Elliptic Curve?*Graduate Seminar, Department of Math, University of Toronto*

April 2017

Fun with Tilings*Graduate Seminar, Department of Math, University of Toronto*

Fall 2018

Möbius Functions and Number Theory*Math Camp, Department of Math, University of Toronto*

Summer 2019

Pigeonhole Principle and its Applications*Graduate Seminar, Department of Math, University of Toronto*

January 2020

Iwasawa Theory and Pseudo-nullity Conjectures*Invited talk, Algebra & Number Theory Seminar, University of Laval*

January 2020

Iwasawa Theory of Fine Selmer Groups*Invited talk, QVNTS, Montreal*

January 2020

CONFERENCES, WORKSHOPS AND SUMMER SCHOOLS**GANITA Conference, The Fields Institute***participant*

June 2016

Summer Graduate School, MSRI*Summer school on Introduction to Character Theory and the McKay Conjecture.*

July 2016

PIMS Summer School, UBC Vancouver*Summer School on Representation Theory of Finite Groups*

July 2016

Fields Medal Symposium, The Fields Institute*participant*

Nov 2016

Montreal-Toronto Workshop in Number Theory, CRM*Workshop on Mock Modular Forms*

Dec 2016

5 Day Workshops at BIRS, Banff*Workshop on Diophantine Approximation and Algebraic Curves*

July 2017

Summer Graduate School, MSRI*Summer school on Automorphic Forms and Langlands Program*

July 2017

AIM Workshop, San Jose <i>Workshop on Functoriality and the Trace Formula</i>	Dec 2017
Montreal-Toronto Workshop in Number Theory, CRM <i>Workshop on Unitary Shimura Varieties</i>	January 2018
Arizona Winter School, Tucson <i>Winter school on Iwasawa Theory</i>	March 2018
PIMS Focus Period, UBC Vancouver <i>Focus Period on Representations in Arithmetic</i>	March 2018
Upstate Number Theory Conference, SUNY Buffalo <i>Young Researchers Conference</i>	April 2018
Strength in Numbers, Queen's University <i>Graduate Student Conference, Contributed talk</i>	May 2018
CTNT Summer School, University of Connecticut <i>Summer School and Conference</i>	May 2018
CNTA Conference, Universite Laval <i>Contributed talk</i>	July 2018
Montreal-Toronto Workshop in Number Theory, CRM <i>Workshop on p-adic Hodge Theory</i>	March 2019
John H. Barrett Memorial Lectures, University of Tennessee <i>participant</i>	May 2019
Analytic & Combinatorial Number Theory, UIUC <i>Contributed talk</i>	June 2019
SOGMSC, University of Guelph <i>Contributed talk</i>	June 2019
Boston University-Keio University Workshop <i>Contributed talk</i>	June 2019
Palmetto Number Theory Seminar (PANTS) XXXII <i>Invited talk</i>	Sep 2019
Maine-Quebec Number Theory Conference <i>Contributed talk</i>	October 2019
MAAIM, Emory University <i>Contributed talk</i>	Nov 2019
CMS Mini-Course on Iwasawa Theory <i>Co-organizer with R. Sujatha</i>	Dec 2019
CMS Summer Meeting <i>Invited talk, Session: Algebraic Number Theory</i>	June 2020
PIMS-Germany School on Eigenvarieties <i>Participant</i>	July 2020

LEARNING SEMINARS ORGANIZED

Summer Learning Seminar on Modular Forms <i>Graduate Seminar, Department of Math, University of Toronto</i>	Summer 2017
Summer Learning Seminar on Galois Cohomology <i>Graduate Seminar, Department of Math, University of Toronto</i>	Summer 2017
Introduction to Automorphic Forms and Langlands Program <i>Graduate Seminar, Department of Math, University of Toronto</i>	Fall 2017
Learning Seminar on Classical Iwasawa Theory <i>Graduate Seminar, Department of Math, University of Toronto</i>	Fall 2017
Learning Seminar on Beyond Endoscopy <i>Graduate Seminar, Department of Math, University of Toronto</i>	2017-18

Learning Seminar on Etale Cohomology*Graduate Seminar, Department of Math, University of Toronto***Winter 2018****Learning Seminar on Complex Multiplication***Graduate Seminar, Department of Math, University of Toronto***Fall 2018****Learning Seminar on p -adic Lie Groups***Graduate Seminar, Department of Math, University of Toronto***Summer 2019****Learning Seminar on Tate Conjectures***Graduate Seminar, Department of Math, University of Toronto***Fall 2019****TEACHING ASSISTANCE EXPERIENCE
(UNIVERSITY OF TORONTO)**

MAT223 (Linear Algebra)*Instructor: Mr. Sean Uppal***Fall/Winter
2015 – 16****MAT235 (Multivariable Calculus)***Instructor: Dr. Nara Jung***Fall/Winter
2018 – 19****MAT237 (Multivariable Calculus)***Instructor: Dr. Tyler Holden, Prof. Robert Gerrard***Summer 2016,
Fall/ Winter
2018 – 19****MAT240 (Linear Algebra for Math Specialists)***Instructor: Prof. Eckhard Meinrenken***Fall 2016;
Fall 2017****MAT246 (Concepts in Abstract Math)***Instructor: Dr. J Korman, Dr. H Soheil, Prof. F Murnaghan, Dr. D. Burbulla***multiple
times****MAT247 (Linear Algebra II for Math Specialists)***Instructor: Prof. Stephen Kudla***Winter 2018****MAT315 (Elementary Number Theory)***Instructor: Prof. Henry Kim***Winter 2020****MAT336 (Elements of Analysis)***Instructor: Dr. H Soheil***Winter 2017****MAT401 (Polynomial Equations and Fields)***Instructor: Dr. Jonathan Korman***Summer 2017****TEACHING EXPERIENCE
(UNIVERSITY OF TORONTO)**

MAT188 (Linear Algebra)*Course Coordinator: Dr. Dietrich Burbulla***Fall 2018****MAT136 (Calculus II)***Course Coordinator: Dr. Sarah Mayes-Tang***Winter 2019****MAT136 (Calculus II)***Course Coordinator along with Daniel Le and Abhishek Oswal***Summer 2019**

EXTRA-CURRICULAR ACTIVITIES

Manthan

2011 - 2012

I was the editor-in-chief of Manthan, the IISER Mohali students' magazine.

Annual Science Day, IISER Mohali

Feb 2012

I was a part of the organizing committee of the Annual Science Day at IISER Mohali where we organized several quizzes, an elocution competition and displayed several scientific phenomena for school students in the tri-city (Chandigarh, Panchkula, Mohali).

Mathematics Club, IISER Mohali

2012 - 2015

I was an active member of the student-run Mathematics Club and over the years had given talks (to mathematical and general audience) on varied areas of mathematics. I was also an active member of the Annual Mathematics Weekend where we organized quizzes, mathematical treasure hunts, mathematical dumb charades and various other such activities.

Opportunity Cell, IISER Mohali

2013 - 2015

I was the student coordinator of the institute Opportunity Cell. Our main aim was to provide information and guidance related to summer/ winter internships, PhD positions and research oriented jobs.

Outreach Committee, IISER Mohali

2013 - 2015

I was a student volunteer of the institute Outreach Committee and had made several presentations. Our main focus was to introduce topics of current scientific research to school teachers (of the Punjab Government school system) and bring out the connection between learning science and doing science.

MGSA, UofT

September
2016 - present

I am a member of the Mathematics Graduate Students' Association, in particular I am a Graduate Planning Committee representative. For the academic year 2018-19, I was appointed the treasurer.

Math Outreach, UofT

2018-present

I am a mentor for the outreach mentor-ship program. I mentored Anna Krokhine for her research project on graph theory and combinatorics in 2018. In 2019, I mentored Maya Bozzo-Rey on her project on Benford's Law. In 2020, my student, Jennifer Wang is exploring questions from number theory.

Women in Math, Toronto Chapter

2019-Present

Female graduate students from schools in and around the Greater Toronto Area have come together for WiM, Toronto Chapter. I am a part of the core team and a mentor for incoming graduate students.

SKILLS

Languages	Bengali (mother tongue)
	English (fluent)
	Hindi (fluent)
Software	L ^A T _E X

REFERENCES

Available upon request