

Debanjana Kundu

Curriculum Vitae

Last Updated: May 21, 2021

PERSONAL DETAILS

Birth January 6, 1993
Address PIMS, 4176-2207 Main Mall, Vancouver, BC, V6T 1Z4 Canada
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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 2015-2020
University of Toronto, Toronto, Canada

EMPLOYMENT

Université de Montréal Fall 2020
CRM-ISM PostDoc, Thematic Program: Cohomology in Arithmetic
University of British Columbia, Vancouver January '21-December '22
PIMS PostDoc Fellow

PUBLICATIONS/ PREPRINTS

1. Growth of Fine Selmer Groups in Infinite Towers
Canadian Mathematics Bulletin (2020) Volume 63 / Issue 4 pp. 921-936.
2. Growth of p -Fine Selmer Groups and p -Fine Shafarevich-Tate Group in $\mathbb{Z}/p\mathbb{Z}$ -Extensions
Journal of the Ramanujan Math Society (2021) Volume 36, No. 1.
3. Growth of Fine Selmer Groups in Uniform pro- p Extensions
Accepted for publication (Annales Mathématiques du Québec)

4. Perfect Powers that are Sums of Squares of an AP (with V. Patel)
Accepted for publication (Rocky Mountain Journal of Mathematics)
5. On an Analogue of Kida's Formula for Fine Selmer Groups
Journal of Number Theory 222 (2021): 249-261.
6. Control Theorems of Fine Selmer Groups (with M. F. Lim)
pre-print available upon request, submitted
7. Characteristic ideals of fine Selmer groups of modular forms and Duality (with A. Lei and J. Ray)
pre-print available upon request, submitted
8. Structure of Fine Selmer Groups in p -adic Lie Extensions (with R. Sujatha)
pre-print available upon request, submitted
9. Anticyclotomic μ -Invariants of Residually Reducible Galois Representations (with A. Ray)
pre-print available on arXiv, submitted
10. Statistics for Iwasawa Invariants of Elliptic Curves (with A. Ray)
accepted for publication (Transactions of the AMS)
11. Iwasawa Invariants for elliptic curves over \mathbb{Z}_p -extensions and Kida's Formula (with A. Ray)
pre-print available on arXiv, submitted
12. Non-vanishing modulo p of Hecke L -values over imaginary quadratic fields (with A. Lei)
pre-print available upon request, submitted

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
Malcolm Slingsby Robertson Prize in Mathematics <i>University of Toronto (best thesis award)</i>	2020
CRM-ISM Postdoctoral Fellowship <i>Université de Montréal</i>	Fall 2020
PIMS Postdoctoral Fellowship <i>University of British Columbia, Vancouver</i>	Jan 2021- Dec 2022

SEMINARS

Introduction to Game Theory <i>Mathematics Club, IISER Mohali</i>	Aug 2012
27 Lines on a Cubic <i>Department Colloquium, IISER Mohali</i>	Nov 2013
Proofs of Quadratic Reciprocity <i>Department Colloquium, IISER Mohali</i>	April 2014
Linear Groups- Malcev's Theorem and Selberg's Lemma <i>IISER Mohali</i>	April 2014
Principal L-Functions of the Linear Group <i>Department of Math, University of Toronto</i>	August 2016
Understanding the Rank Distribution Conjecture <i>Graduate Seminar, Department of Math, University of Toronto</i>	Nov 2016
What is an Elliptic Curve? <i>Graduate Seminar, Department of Math, University of Toronto</i>	April 2017
Fun with Tilings <i>Graduate Seminar, Department of Math, University of Toronto</i>	Fall 2018
Möbius Functions and Number Theory <i>Math Camp, Department of Math, University of Toronto</i>	Summer 2019
Pigeonhole Principle and its Applications <i>Graduate Seminar, Department of Math, University of Toronto</i>	January 2020
Iwasawa Theory and Pseudo-nullity Conjectures <i>Invited talk, Algebra & Number Theory Seminar, University of Laval</i>	January 2020
Iwasawa Theory of Fine Selmer Groups <i>Invited talk, QVNTS, Montreal</i>	January 2020
Overview of Iwasawa Theory <i>Invited talk, Junior Number Theory Seminar, University of Toronto</i>	October 2020

Iwasawa Theory of Fine Selmer Groups <i>Invited talk, Fields Institute Number Theory Seminar video</i>	November '20
Iwasawa Theory of Fine Selmer Groups <i>Invited talk, PIMS Online Colloquium</i>	February '21
Iwasawa Theory of Fine Selmer Groups <i>Invited talk, Number Theory Seminar, University of Toronto</i>	March 2021
TBA <i>Invited lecture series (3 lectures), Seoul National University</i>	Summer 2021

CONFERENCES, WORKSHOPS AND SUMMER SCHOOLS

GANITA Conference, The Fields Institute <i>participant</i>	June 2016
Summer Graduate School, MSRI <i>Summer school on Introduction to Character Theory and the McKay Conjecture.</i>	July 2016
PIMS Summer School, UBC Vancouver <i>Summer School on Representation Theory of Finite Groups</i>	July 2016
Fields Medal Symposium, The Fields Institute <i>participant</i>	Nov 2016
Montreal-Toronto Workshop in Number Theory, CRM <i>Workshop on Mock Modular Forms</i>	Dec 2016
5 Day Workshops at BIRS, Banff <i>Workshop on Diophantine Approximation and Algebraic Curves</i>	July 2017
Summer Graduate School, MSRI <i>Summer school on Automorphic Forms and Langlands Program</i>	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
CTNT Conference, University of Connecticut <i>Contributed talk slides</i>	June 2020
Maine-Quebec Number Theory Conference <i>Contributed talk slides video</i>	Fall 2020
John's Hopkins Junior Number Theory Days <i>Invited Talk notes video</i>	Dec 2020
AIM Workshop, Online <i>Workshop on Arithmetic Intersection Theory on Shimura Varieties</i>	Jan 2021
Spring School towards a mod-p Langlands correspondence <i>participant</i>	April 2021
CMS Summer Meeting <i>Invited talk, Session: Algebraic Number Theory</i>	June 2021

LEARNING SEMINARS ORGANIZED/ PARTICIPATED

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 <i>Graduate Seminar, Department of Math, University of Toronto</i>	Winter 2018
Learning Seminar on Complex Multiplication <i>Graduate Seminar, Department of Math, University of Toronto</i>	Fall 2018
Learning Seminar on p-adic Lie Groups <i>Graduate Seminar, Department of Math, University of Toronto</i>	Summer 2019
Learning Seminar on Tate Conjectures <i>Graduate Seminar, Department of Math, University of Toronto</i>	Fall 2019
Learning Seminar on Abelian ℓ-Adic Representations <i>Graduate Seminar, Department of Math, University of Toronto</i>	Summer 2020
Learning Seminar on Euler system and Eisenstein congruences <i>Iwasawa Seminar, Department of Math, UBC Vancouver</i>	Fall 2020
CRM Women's Seminar <i>Part of the thematic program at CRM</i>	Fall 2020
Learning Seminar on Coleman Families of Modular Forms <i>Part of the thematic program at CRM</i>	Fall 2020
Learning Seminar on Eigenvarieties <i>Iwasawa Seminar, Department of Math, UBC Vancouver notes</i>	Winter 2021

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

MAT237 (Multivariable Calculus)

Course Coordinator along with Travis Ens, Armanpreet Pannu, and Ren Zhu

Summer 2020

University of British Columbia (Vancouver):

MAT105 (Integral Calculus for Social Sciences and Commerce)

Course Coordinator: Keqin Liu

Winter 2021

SERVICE

*Refereed
for
Reviewer
for*

Annales Mathématiques du Québec, Canadian Math Bulletin
Mathematics Reviews

EXTRA-CURRICULAR ACTIVITIES

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. We also organized the Annual Science Day for school students in the tri-city area (Chandigarh-Panchkula-Mohali).

MGSA, UofT

2016 - 2020

I was an active member of the Mathematics Graduate Students' Association. For several years, I was a Graduate Planning Committee representative. In addition, for the academic year 2018-19, I was appointed the treasurer.

Math Outreach, UofT

2018-2020

I was a mentor for the high school 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 explored questions from number theory.

Women in Math, Toronto Chapter

2019-2020

Female graduate students from schools in and around the Greater Toronto Area came together for WiM, Toronto Chapter in 2019. I was a part of the core team and a mentor for incoming graduate students.

Outreach, UBC

2021-present

I was an adjudicator for MURC 2021. This is an undergraduate level multi-disciplinary research conference organized at UBC every year.

SKILLS

Languages

Bengali (mother tongue)
English (fluent)
Hindi (fluent)

Software

L^AT_EX

REFERENCES

Available upon request