Debanjana Kundu

Curriculum Vitae

Last Updated: July 6, 2021

PERSONAL DETAILS

Birth	January 6, 1993
Address	PIMS, 4176-2207 Main Mall, Vancouver, BC, V6T 1Z4 Canada
Phone	(+1) 437-344-2592
Mail	dkundu@math.ubc.ca

EDUCATION

Class X 2008
CBSE (India)
All India Rank 2

Class XII 2010
CBSE (India)
Top 1% in 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 2021–December 2022
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

13. Statistics for anticyclotomic Iwasawa invariants of elliptic curves (with J. Hatley and A. Ray) *pre-print available on arXiv, submitted*

14. Statistics for Iwasawa Invariants of Elliptic Curves II (with A. Ray)
    pre-print available on arXiv, submitted

FELLOWSHIPS

INSPIRE Fellowship 2010–2015
Department of Science and Technology, Government of India

JNCASR Summer Fellowship 2012
JNCASR, India

DAAD WISE Scholarship 2013
Germany

IAS Summer Fellowship (not availed) 2013
Indian Academy of Sciences, India

MITACS Globalink Research Internship 2014
Canada

Rhodes Scholarship finalist (top 18) Class of 2015
Oxford University, UK

TIFR VSRP Fellowship 2015
TIFR, India

BIGS Scholarship for Graduate Studies (not availed) 2015–2018
Hausdorff Center for Mathematics, Bonn, Germany

MITACS Graduate Fellowship 2015–2018
Canada

Vivekananda Graduate Award for International Students 2018–2019
University of Toronto

General Motors Women in Mathematics and Science Award 2019–2020
University of Toronto

Malcolm Slingsby Robertson Prize in Mathematics 2020
University of Toronto (best thesis award)

CRM-ISM Postdoctoral Fellowship Fall 2020
Université de Montréal

PIMS Postdoctoral Fellowship January 2021–December 2022
University of British Columbia, Vancouver

SEMINARS

Introduction to Game Theory Aug 2012
Mathematics Club, IISER Mohali

27 Lines on a Cubic Nov 2013
Department Colloquium, IISER Mohali

Proofs of Quadratic Reciprocity April 2014
Department Colloquium, IISER Mohali

Linear Groups- Malcev's Theorem and Selberg's Lemma April 2014
IISER Mohali

Principal L-Functions of the Linear Group August 2016
Department of Math, University of Toronto

Understanding the Rank Distribution Conjecture Nov 2016
Graduate Seminar, Department of Math, University of Toronto

What is an Elliptic Curve? April 2017
Graduate Seminar, Department of Math, University of Toronto

Fun with Tilings Fall 2018
Graduate Seminar, Department of Math, University of Toronto

Möbius Functions and Number Theory Summer 2019
Math Camp, Department of Math, University of Toronto

Pigeonhole Principle and its Applications January 2020
Graduate Seminar, Department of Math, University of Toronto

Iwasawa Theory and Pseudo-nullity Conjectures January 2020
Invited talk, Algebra & Number Theory Seminar, University of Laval

Iwasawa Theory of Fine Selmer Groups January 2020

Invited talk, QVNTS, Montreal

Overview of Iwasawa Theory October 2020
Invited talk, Junior Number Theory Seminar, University of Toronto

Iwasawa Theory of Fine Selmer Groups November 2020
Invited talk, Fields Institute Number Theory Seminar video

Iwasawa Theory of Fine Selmer Groups February 2021
Invited talk, PIMS Online Colloquium

Iwasawa Theory of Fine Selmer Groups March 2021
Invited talk, Number Theory Seminar, University of Toronto

Iwasawa Theory Summer 2021
Invited lecture series (3 lectures), Seoul National University

Iwasawa Theory and Arithmetic Statistics June 2021
Invited talk, University of Göttingen

CONFERENCES, WORKSHOPS AND SUMMER SCHOOLS

GANITA Conference, The Fields Institute June 2016
participant

Summer Graduate School, MSRI July 2016
Summer school on Introduction to Character Theory and the McKay Conjecture.

PIMS Summer School, UBC Vancouver July 2016
Summer School on Representation Theory of Finite Groups

Fields Medal Symposium, The Fields Institute Nov 2016
participant

Montreal-Toronto Workshop in Number Theory, CRM Dec 2016
Workshop on Mock Modular Forms

5 Day Workshops at BIRS, Banff July 2017
Workshop on Diophantine Approximation and Algebraic Curves

Summer Graduate School, MSRI July 2017
Summer school on Automorphic Forms and Langlands Program

AIM Workshop, San Jose Dec 2017
Workshop on Functoriality and the Trace Formula

Montreal-Toronto Workshop in Number Theory, CRM January 2018
Workshop on Unitary Shimura Varieties

Arizona Winter School, Tucson March 2018
Winter school on Iwasawa Theory

PIMS Focus Period, UBC Vancouver March 2018
Focus Period on Representations in Arithmetic

Upstate Number Theory Conference, SUNY Buffalo April 2018
Young Researchers Conference

Strength in Numbers, Queen's University May 2018
Graduate Student Conference, Contributed talk

CTNT Summer School, University of Connecticut May 2018
Summer School and Conference

CNTA Conference, Universite Laval July 2018
Contributed talk

Montreal-Toronto Workshop in Number Theory, CRM March 2019
Workshop on p-adic Hodge Theory

John H. Barrett Memorial Lectures, University of Tennessee May 2019
participant

Analytic & Combinatorial Number Theory, UIUC June 2019

Contributed talk

SOGMSC, University of Guelph June 2019
Contributed talk

Boston University-Keio University Workshop June 2019
Contributed talk

PAlmetto Number Theory Seminar (PANTS) XXXII Sep 2019
Invited talk

Maine-Quebec Number Theory Conference October 2019
Contributed talk

MAAIM, Emory University Nov 2019
Contributed talk

CMS Mini-Course on Iwasawa Theory Dec 2019
Co-organizer with R. Sujatha

CTNT Conference, University of Connecticut June 2020
Contributed talk slides

Maine-Quebec Number Theory Conference Fall 2020
Contributed talk slides video

John's Hopkins Junior Number Theory Days Dec 2020
Invited Talk notes video

AIM Workshop, Online Jan 2021
Workshop on Arithmetic Intersection Theory on Shimura Varieties

Spring School towards a mod-p Langlands correspondence April 2021
participant

CMS Summer Meeting June 2021
Invited talk (Statistics of Iwasawa Invariants), Session: Algebraic Number Theory

Workshop on Arithmetic Statistics Problems July 2021
Invitation-only Conference

LEARNING SEMINARS ORGANIZED/ PARTICIPATED

Summer Learning Seminar on Modular Forms Summer 2017
Graduate Seminar, Department of Math, University of Toronto

Summer Learning Seminar on Galois Cohomology Summer 2017
Graduate Seminar, Department of Math, University of Toronto

Introduction to Automorphic Forms and Langlands Program Fall 2017
Graduate Seminar, Department of Math, University of Toronto

Learning Seminar on Classical Iwasawa Theory Fall 2017
Graduate Seminar, Department of Math, University of Toronto

Learning Seminar on Beyond Endoscopy 2017–18
Graduate Seminar, Department of Math, University of Toronto

Learning Seminar on Etale Cohomology Winter 2018
Graduate Seminar, Department of Math, University of Toronto

Learning Seminar on Complex Multiplication Fall 2018
Graduate Seminar, Department of Math, University of Toronto

Learning Seminar on p-adic Lie Groups Summer 2019
Graduate Seminar, Department of Math, University of Toronto

Learning Seminar on Tate Conjectures Fall 2019
Graduate Seminar, Department of Math, University of Toronto

Learning Seminar on Abelian ℓ-Adic Representations Summer 2020
Graduate Seminar, Department of Math, University of Toronto

Learning Seminar on Euler system and Eisenstein congruences Fall 2020
Iwasawa Seminar, Department of Math, UBC Vancouver

CRM Women's Seminar Fall 2020
Part of the thematic program at CRM

Learning Seminar on Coleman Families of Modular Forms Fall 2020
Part of the thematic program at CRM

Learning Seminar on Eigenvarieties Winter 2021
Iwasawa Seminar, Department of Math, UBC Vancouver notes

Learning Seminar on Quadratic Twists Winter 2021
Iwasawa Seminar, online

TEACHING ASSISTANCE EXPERIENCE (UNIVERSITY OF TORONTO)

MAT223 (Linear Algebra) Fall/Winter 2015–16
Instructor: Mr. Sean Uppal

MAT235 (Multivariable Calculus) Fall/Winter 2018–19
Instructor: Dr. Nara Jung

MAT237 (Multivariable Calculus) Summer 2016, Fall/Winter 2018–19
Instructor: Dr. Tyler Holden, Prof. Robert Gerrard

MAT240 (Linear Algebra for Math Specialists) Fall 2016; Fall 2017
Instructor: Prof. Eckhard Meinrenken

MAT246 (Concepts in Abstract Math) Multiple
Instructor: Dr. J Korman, Dr. H Soheil, Prof. F Murnaghan, Dr. D. Burbulla

MAT247 (Linear Algebra II for Math Specialists) Winter 2018
Instructor: Prof. Stephen Kudla

MAT315 (Elementary Number Theory) Winter 2020
Instructor: Prof. Henry Kim

MAT336 (Elements of Analysis) Winter 2017
Instructor: Dr. H Soheil

MAT401 (Polynomial Equations and Fields) Summer 2017
Instructor: Dr. Jonathan Korman

TEACHING EXPERIENCE

University of Toronto:

MAT188 (Linear Algebra) Fall 2018
Course Coordinator: Dr. Dietrich Burbulla

MAT136 (Calculus II) Winter 2019
Course Coordinator: Dr. Sarah Mayes-Tang

MAT136 (Calculus II) Summer 2019
Course Coordinator along with Daniel Le and Abhishek Oswal

MAT237 (Multivariable Calculus) Summer 2020
Course Coordinator along with Travis Ens, Armanpreet Pannu, and Ren Zhu

University of British Columbia (Vancouver):
MAT105 (Integral Calculus for Social Sciences and Commerce) Winter 2021
Course Coordinator: Keqin Liu

SERVICE

Refereed for	Annales Mathématiques du Québec, Canadian Math Bulletin
Reviewer for	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.

Undergraduate Mentorship 2021–present
I have been supervising Shubhrajit Bhattacharya (undergraduate student at Chennai Mathematical Institute, India) for his reading project on Iwasawa theory.

Panelist at MathPath July 2021
I was a panelist at the MathPath Summer Camp for middle school students talking about hardships faced as a female mathematician.

SKILLS

Languages	Bengali (mother tongue) English (fluent) Hindi (fluent)
Software	LaTeX

REFERENCES

Available upon request.