Debanjana Kundu

Curriculum Vitae

Last Updated: August 10, 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.

- Anticyclotomic μ-Invariants of Residually Reducible Galois Representations (with A. Ray)
 - accepted for publication (Journal of Number Theory)
- 7. Statistics for Iwasawa Invariants of Elliptic Curves (with A. Ray) accepted for publication (Transactions of the AMS)
- 8. Control Theorems of Fine Selmer Groups (with M. F. Lim) pre-print available upon request, submitted
- 9. On the fine Selmer groups of modular forms and duality (with J. Hatley, A. Lei, and J. Ray)

 pre-print available upon request, submitted
- 10. Structure of fine Selmer Groups in p-adic Lie Extensions (with R. Sujatha) pre-print available upon request, submitted
- 11. Iwasawa Invariants for elliptic curves over \mathbb{Z}_p -extensions and Kida's Formula (with A. Ray) pre-print available on arXiv, submitted
- 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
- 15. Rank jumps and growth of Shafarevich-Tate groups for elliptic curves in $\mathbb{Z}/p\mathbb{Z}$ extensions (with L. Beneish and A. Ray) pre-print available on arXiv, submitted
- 16. Growth of p-parts of ideal class groups and fine Selmer groups in \mathbb{Z}_q -extensions with $p \neq q$ (with A. Lei) preprint available upon request, 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	December 2022

SEMINARS

Introduction to Game Theory	Aug 2012
Mathematics Club, IISER Mohali	<u> </u>
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

The state of the s	
GANITA Conference, The Fields Institute	June 2016
participant S. C. Land MSDI	I 1 001C
Summer Graduate School, MSRI	July 2016
Summer school on Introduction to Character Theory and the McKay C	•
PIMS Summer School, UBC Vancouver	July 2016
Summer School on Representation Theory of Finite Groups	N 0010
Fields Medal Symposium, The Fields Institute participant	Nov 2016
Montreal-Toronto Workshop in Number Theory, CRM	Dec 2016
Workshop on Mock Modular Forms	DCC 2010
5 Day Workshops at BIRS, Banff	July 2017
Workshop on Diophantine Approximation and Algebraic Curves	odiy 2011
Summer Graduate School, MSRI	July 2017
Summer school on Automorphic Forms and Langlands Program	July 2011
AIM Workshop, San Jose	Dec 2017
Workshop on Functoriality and the Trace Formula	DCC 2011
Montreal-Toronto Workshop in Number Theory, CRM	January 2018
Workshop on Unitary Shimura Varieties	Č
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 Mantraed Tenante Werlichen in Number Theory CDM	M 1 0010
Montreal-Toronto Workshop in Number Theory, CRM Workshop on p-adic Hodge Theory	March 2019
John H. Barrett Memorial Lectures, University of Tennessee	May 2019
participant	1,10, 2010
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 2011
Summer Learning Seminar on Galois Cohomology	Summer 2017
Graduate Seminar, Department of Math, University of Toronto	Summer 2011
Introduction to Automorphic Forms and Langlands Program	Fall 2017
Graduate Seminar, Department of Math, University of Toronto	1 411 2017
Learning Seminar on Classical Iwasawa Theory	Fall 2017
Graduate Seminar, Department of Math, University of Toronto	1 411 2017
Learning Seminar on Beyond Endoscopy	2017–18
Graduate Seminar, Department of Math, University of Toronto	2017 10
Learning Seminar on Etale Cohomology	Winter 2018
Graduate Seminar, Department of Math, University of Toronto	Willion 2010
Learning Seminar on Complex Multiplication	Fall 2018
Graduate Seminar, Department of Math, University of Toronto	ran 2010
Learning Seminar on p-adic Lie Groups	Summer 2019
Graduate Seminar, Department of Math, University of Toronto	Summer 2019
Learning Seminar on Tate Conjectures	Fall 2019
Graduate Seminar, Department of Math, University of Toronto	ran 2019
Learning Seminar on Abelian ℓ -Adic Representations	Summer 2020
Graduate Seminar, Department of Math, University of Toronto	Summer 2020
Learning Seminar on Euler system and Eisenstein congruences	E-11 0000
Iwasawa Seminar, Department of Math, UBC Vancouver	Fall 2020
CRM Women's Seminar	E 11 0000
	Fall 2020
Part of the thematic program at CRM	E 11 2020
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)

Course Coordinator: Keqin Liu

Winter 2021

ACADEMIC SERVICES

Refereed for Annales Mathématiques du Québec, Canadian Math Bulletin,

Czechoslovak Mathematical Journal

Reviewer for Mathematics Reviews

NON-ACADEMIC SERVICES

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.

(J)EDI Committee, UBC

2021-present

I am a member of the Math Department (Justice), Equity, Diversity and Inclusion Committee at UBC, Vancouver.

SKILLS

Languages Bengali (mother tongue)

English (fluent) Hindi (fluent)

Software IAT_EX

REFERENCES

Available upon request.