Curriculum Vitae
Debaditya Raychaudhury

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Contact Information

Department of Mathematics,
University of Arizona,
617 N. Santa Rita Ave.,
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Employment

University of Arizona	Tucson, AZ, USA
Postdoctoral Research Associate I	2023 – Present
University of Toronto	Toronto, ON, Canada
Postdoctoral Fellow	2022 – 2023
The Fields Institute for Research in Mathematical Sciences	Toronto, ON, Canada
Simons Postdoctoral Fellow	2021 – 2022

Education

University of Kansas	Lawrence, KS, USA
Ph.D. in Mathematics	2015 – 2021

- ○ THESIS: Projective Normality and Normal Presentation for Adjoint Linear Series on Minimal Varieties
- ○ ADVISOR: Purnaprajna Bangere

University of Kansas	Lawrence, KS, USA
M.A. in Mathematics	2015 – 2016
Chennai Mathematical Institute	Chennai, TN, India
M.Sc. in Mathematics	2013 – 2015
Chennai Mathematical Institute	Chennai, TN, India
B.Sc. (Hons.) in Mathematics and Computer Science	2010 – 2013

Fellowships and Grants

- **AMS-Simons Travel Grant** - $5000   2024 - 2026
- **PI on Conference Grant DMS-2412921** - $15,000   2024
  National Science Foundation
- **Simons Postdoctoral Fellowship**   2021 – 2022
  Fields Institute for Research in Mathematical Sciences

Research Interests

My research is focused on Algebraic Geometry. I am interested in problems on positivity of linear series and syzygies of projective varieties, aCM and Ulrich bundles on projective varieties, Hodge theory and singularities in birational geometry, Fourier–Mukai transforms and generic vanishing theory, deformation theory and geometry of moduli spaces.

Published and Accepted Articles

12. S. Olano, D. Raychaudhury, L. Song. *Singularities of secant varieties from a Hodge theoretic perspective.* **Proc. Lond. Math. Soc.**, to appear. [journal] [arXiv]

11. V. Antonelli, G. Casnati, A.F. Lopez, D. Raychaudhury. *On varieties with Ulrich twisted conormal bundles.* **Proc. Amer. Math. Soc.**, to appear. [journal] [arXiv]

10. D. Raychaudhury. *Continuous CM–regularity and generic vanishing* with an appendix by A. Ito. **Adv. Geom.** 24 (2024), no. 1, 19-37. [journal] [arXiv]

9. P. Bangere, J. Mukherjee, D. Raychaudhury. *Koszul property of Ulrich bundles and rationality of moduli spaces of stable bundles on Del Pezzo surfaces.* **Manuscripta Math.** 174 (2024), 847–874. [journal] [arXiv]

8. A.F. Lopez, D. Raychaudhury. *On varieties with Ulrich twisted tangent bundles.* **Ann. Mat. Pura Appl.** 203 (2024), 1159-1193. [journal] [arXiv]

7. P. Bangere, F. J. Gallego, J. Mukherjee, D. Raychaudhury. *Deformations and moduli of irregular canonical covers with $K^2 = 4p_g - 8$.* **Rev. Mat. Complut.** 37 (2024), no. 2, 551–602. [journal] [arXiv]

6. P. Kundu, J. Mukherjee, D. Raychaudhury. *Tautological families of cyclic covers of projective spaces.* **Eur. J. Math.** 9 (2023), no. 4, Paper No. 118, 37 pp. [journal] [arXiv]

5. J. Mukherjee, D. Raychaudhury. *A note on stability of syzygy bundles on Enriques and bielliptic surfaces.* **Proc. Amer. Math. Soc.** 150 (2022), no. 9, 3715–3724. [journal] [arXiv]

4. J. Mukherjee, D. Raychaudhury. *Smoothing of multiple structures on embedded Enriques manifolds.* **Math. Z.** 300 (2022), no. 2, 1241–1263. [journal] [arXiv]

3. P. Bangere, J. Mukherjee, D. Raychaudhury. *K3 carpets on minimal rational surfaces and their smoothings.* **Internat. J. Math.** 32 (2021), no. 6, 2150032, 20 pp. [journal] [arXiv]

2. J. Mukherjee, D. Raychaudhury. *Remarks on projective normality for certain Calabi–Yau and hyperkähler varieties.* **J. Pure Appl. Algebra** 224 (2020), no. 10, 106383, 19 pp. [journal] [arXiv]

1. J. Mukherjee, D. Raychaudhury. *On the projective normality and normal presentation on higher dimensional varieties with nef canonical bundle.* **J. Algebra** 540 (2019), 121–155. [journal] [arXiv]

Preprints

6. G.V. Ravindra, D. Raychaudhury. *Extendable codimension two subvarieties in a general hypersurface.* (2024) [pdf]

5. S. Olano, D. Raychaudhury. *On the local cohomology of secant varieties.* (2024) arXiv:2407.16688 [arXiv]

4. A.F. Lopez, D. Raychaudhury. *Non-existence of low rank Ulrich bundles on Veronese varieties.* (2024) arXiv:2406.08162 [arXiv]

3. A.F. Lopez, D. Raychaudhury. *Ulrich subvarieties and the non-existence of low rank Ulrich bundles on complete intersections.* (2024) arXiv:2405.01154 [arXiv]

2. A.F. Lopez, D. Raychaudhury. *On partially ample Ulrich bundles.* (2024) arXiv:2403.18928 [arXiv]

1. P. Bangere, F. J. Gallego, J. Mukherjee, D. Raychaudhury. *Construction of varieties of low codimension with applications to moduli spaces of varieties of general type.* (2022) arXiv:2012.01682 [arXiv]

Short Research Visits

Università degli Studi Roma Tre, Rome, Italy   Sep. 2024
Collaboration with Angelo Felice Lopez

Invited Talks

- University of California Riverside, Riverside, CA   Oct. 2024
  AMS 2024 Fall Western Sectional Meeting
  Special Session on Moduli
- Georgia Southern University, Savannah, GA   Oct. 2024
  AMS 2024 Fall Southern Sectional Meeting
  Special Session on Topics in commutative algebra and algebraic geometry
- University of Leiden, Leiden, The Netherlands   Sep. 2024
  Algebraic Geometry & Number Theory (AGNT) Seminar
- Indian Institute of Science, Bengaluru, India   Jun. 2024
  Algebra & Combinatorics Seminar
- Chennai Mathematical Institute, Chennai, India   Jun. 2024
  Mathematics Seminar
- Indian Institute of Technology Bombay, Mumbai, India   May 2024
  Mathematics Seminar
- Oklahoma State University, Stillwater, OK   Apr. 2024
  Department Colloquium
- Simon Fraser University, Burnaby, BC (Online)   Jan. 2024
  SFU Number Theory and Algebraic Geometry Seminar
- Canadian Mathematical Society Winter Meeting 2023, Montreal, QC   Dec. 2023
  Session: *Algebraic, Arithmetic and Kähler Geometry: Recent developments*
- University of Arkansas, Fayetteville, AR   Oct. 2023
  Algebra Seminar
- University of Toronto, Toronto, ON   Nov. 2022
  Algebraic Geometry Seminar
- Queen's University, Kingston, ON   Oct. 2022
  Algebra and Geometry Seminar
- Fields Institute for Research in Mathematical Sciences, Toronto, ON   Oct. 2022
  Fields Number Theory Seminar
- Fields Institute for Research in Mathematical Sciences, Toronto, ON   Jan. 2022
  Fields Postdoc Colloquium
- University of Nebraska-Lincoln, Lincoln, NE (**Cancelled**)   Apr. 2020
  URiCA-KUMUNUjr
- University of Illinois Chicago, Chicago, IL   Mar. 2019
  Midwest Algebraic Geometry Graduate Conference (MAGGC)

Contributed Talks

- University of Arizona, Tucson, AZ   Oct. 2023
  Algebraic Geometry Seminar

- University of Arizona, Tucson, AZ — Sep. 2023
  Algebraic Geometry Seminar
- Fields Institute, Toronto, ON (Online) — Sep. 2021
  Ganita Seminar
- University of Illinois Chicago, Chicago, IL (Online lightning talk) — May 2020
  Midwest Algebraic Geometry Graduate Conference (MAGGC)
- University of Kansas, Lawrence, KS — Nov. 2019
  Geometry Seminar
- University of Kansas, Lawrence, KS — Sep. 2018
  Geometry Seminar

Poster Presentations

- University of Michigan, Ann Arbor, MI — May 2024
  Singularities in Ann Arbor
- University of California, Davis, Davis, CA — Apr. 2024
  Western Algebraic Geometry Symposium (WAGS)
- Washington University, St. Louis, MO — Nov. 2023
  Western Algebraic Geometry Symposium (WAGS)
- Università degli Studi Roma Tre, Rome, Italy — Jun. 2022
  Algebraic Geometry in Roma Tre
  (A conference on the occasion of Sandro Verra's 70(+2)-th birthday)
- University of Utah, Salt Lake City, UT — Nov. 2019
  Western Algebraic Geometry Symposium (WAGS)
- University of Arkansas, Fayetteville, AR — Feb. 2018
  Southwest Local Algebra Meeting (SLAM)

Teaching Experiences

University of Arizona - Instructor
- MATH 243 – Discrete mathematics for computer science (Fall 2024)
- MATH 313 – Introduction to linear algebra (Spring 2024)
- MATH 122B – First semester calculus (Fall 2023)

University of Toronto - Instructor
- MAT137 – Calculus with proofs (Winter 2023)

University of Kansas - Instructor
- MATH 127 – Calculus III (Summer 2018)
- MATH 126 – Calculus II (Summer 2019)
- MATH 125/197 – Calculus I Enhanced (Spring 2018, 2020, 2021, Fall 2019)
- MATH 115 – Applied Calculus I (Fall 2015, 2016, Spring 2016)
- MATH 104 – Precalculus (Fall 2018)

University of Kansas - Recitation Instructor
- MATH 126 – Calculus II (Spring 2019, Fall 2020)
- MATH 125 – Calculus I (Spring 2017, Fall 2017)

Awards and Honors

- *Charles J. and Mary Pat Himmelberg Graduate Student Award*   2020
  University of Kansas (awarded annually to outstanding mathematics graduate students)
- Selected: *MSRI summer graduate school on algebraic curves*, Hainan, China (**Cancelled**)   2020
- Nomination: *Florence Black Award for Excellence in Teaching*   2018, 2019, 2021
  University of Kansas (an award limited to 5 nominees and 1 winner per year)
- *U.G. Mitchell Graduate Summer Scholarship*   2018, 2020
  University of Kansas
- *Graduate Scholarship*   2013 – 2015
  Chennai Mathematical Institute
- *INSPIRE Scholarship for Higher Education (SHE)*   2010 – 2013
  Department of Science and Technology, Govt. of India

Organizing

- *Western Algebraic Geometry Symposium (WAGS)*   Nov. 2024
  University of Arizona, Tucson, AZ
- *Commutative Algebra and Algebraic Geometry in TUcSon (CAAGTUS)*   May 2024
  University of Arizona, Tucson, AZ
- *Algebraic Geometry Seminar*   2023 – 2025
  University of Arizona, Tucson, AZ
- *Geometry Seminar*   2019 – 2021
  University of Kansas, Lawrence, KS

Refereeing and Reviewing

- REFEREE: *Communications in Algebra*
- REVIEWER: *zbMATH*   2020 – Present

Participation in Special Programs

- *Workshop on higher Du Bois and higher rational singularities*   Oct. 2024
  American Institute of Mathematics, Pasadena, CA
- *Singularities in Ann Arbor*   May 2024
  University of Michigan, Ann Arbor, MI
- *Workshop on Lefschetz Properties in Algebra, Geometry, Topology and Combinatorics*   May 2023
  Fields Institute, Toronto, ON
- *Birational Complexity of Algebraic Varieties*   Dec. 2022
  Simons Center for Geometry and Physics, Stony Brook, NY
- *MPS Conference on Higher Dimensional Geometry*   Feb. 2022
  Simons Center for Geometry and Physics, Stony Brook, NY
- *Hodge Theory, Moduli and Representation Theory*   Aug. 2017
  Stony Brook University, Stony Brook, NY

Outreach

- Secretary: *Graduate Student Organization*, University of Kansas   2019 – 2020

Computing and Languages

Programming Languages: C++, Python, Haskell, Java, Mathematica
Languages: English (second language), Bengali (native)