

CURRICULUM VITAE

DEBADITYA RAYCHAUDHURY

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CONTACT INFORMATION

Department of Mathematics,
University of Arizona,
617 N. Santa Rita Ave.,
Tucson, AZ 85721, USA

EMPLOYMENT

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

EDUCATION

University of Kansas <i>Ph.D. in Mathematics</i> <ul style="list-style-type: none">◦ THESIS: Projective Normality and Normal Presentation for Adjoint Linear Series on Minimal Varieties◦ ADVISOR: Purnaprajna Bangere	Lawrence, KS, USA 2015 – 2021
University of Kansas <i>M.A. in Mathematics</i>	Lawrence, KS, USA 2015 – 2016
Chennai Mathematical Institute <i>M.Sc. in Mathematics</i>	Chennai, TN, India 2013 – 2015
Chennai Mathematical Institute <i>B.Sc. (Hons.) in Mathematics and Computer Science</i>	Chennai, TN, India 2010 – 2013

FELLOWSHIPS AND GRANTS

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

RESEARCH INTERESTS

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

PUBLISHED AND ACCEPTED ARTICLES

13. 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*. **J. Lond. Math. Soc.** (2) 110 (2024), no. 6, Paper No. e70030, 48 pp. [[journal](#)] [[arXiv](#)]
12. S. Olano, D. Raychaudhury, L. Song. *Singularities of secant varieties from a Hodge theoretic perspective*. **Proc. Lond. Math. Soc.** (3) 129 (2024), no. 4, Paper No. e12635, 34 pp. [[journal](#)] [[arXiv](#)]
11. V. Antonelli, G. Casnati, A.F. Lopez, D. Raychaudhury. *On varieties with Ulrich twisted conormal bundles*. **Proc. Amer. Math. Soc.** 152 (2024), no. 11, 4645–4658. [[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

7. A.F. Lopez, D. Raychaudhury. *A lower bound on the Ulrich complexity of hypersurfaces*. (2025) arXiv:2503.13396 [[arXiv](#)]
6. B. Dirks, S. Olano, D. Raychaudhury. *A Hodge theoretic generalization of \mathbb{Q} -homology manifolds*. (2025) arXiv:2501.14065 [[arXiv](#)]
5. G.V. Ravindra, D. Raychaudhury. *Extendable codimension two subvarieties in a general hypersurface*. (2024) [[pdf](#)]
4. S. Olano, D. Raychaudhury. *On the local cohomology of secant varieties*. (2024) arXiv:2407.16688 [[arXiv](#)]

3. A.F. Lopez, D. Raychaudhury. *Non-existence of low rank Ulrich bundles on Veronese varieties.* (2024) arXiv:2406.08162 [[arXiv](#)]
2. A.F. Lopez, D. Raychaudhury. *Ulrich subvarieties and the non-existence of low rank Ulrich bundles on complete intersections.* (2024) arXiv:2405.01154 [[arXiv](#)]
1. A.F. Lopez, D. Raychaudhury. *On partially ample Ulrich bundles.* (2024) arXiv:2403.18928 [[arXiv](#)]

SHORT RESEARCH VISITS

- Università degli Studi Roma Tre, Rome, Italy Sep. 2024
Visiting Angelo Felice Lopez
- University of Leiden, Leiden, The Netherlands Sep. 2024
Visiting Yajnaseni Dutta

INVITED TALKS

- University of Wisconsin–Madison, Madison, WI Apr. 2025
Singularities in the Midwest, IX
- University of Kansas, Lawrence, KS Mar. 2025
AMS 2025 Spring Central Sectional Meeting
 - *Special Session on Topics in classical algebraic geometry*
 - *Special Session on Interplay between birational geometry, complex geometry and Hodge theory*
- Arizona State University, Tempe, AZ Mar. 2025
Number Theory and Algebra Seminar
- Colorado State University, Fort Collins, CO Feb. 2025
FRAGMENT Seminar
- University of California Riverside, Riverside, CA Oct. 2024
AMS 2024 Fall Western Sectional Meeting
Special Session on Moduli
- Georgia Southern University, Savannah, GA (Cancelled due to Hurricane Helene) 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 due to Covid-19*) 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 (Short talk) Nov. 2024
Mathematics Colloquium: Featuring UA Math Postdocs
- 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

TEACHING EXPERIENCES

UNIVERSITY OF ARIZONA - INSTRUCTOR

- MATH 413/513 – Linear Algebra (Spring 2025)
- 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)
- 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, Journal of Algebra, Journal de l'École polytechnique – Mathématiques, Rendiconti del Seminario Matematico (Univ. Pol. Torino)*
- REVIEWER: *Mathematical Reviews (MathSciNet), zbMATH*

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)