

# 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

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

### EDUCATION

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

### FELLOWSHIPS AND GRANTS

• <b>AMS-Simons Travel Grant</b> - \$5000	2024 - 2026
• <b>PI on Conference Grant DMS-2412921</b> - \$15,000 <i>National Science Foundation</i>	2024
• <b>Simons Postdoctoral Fellowship</b> <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.

14. A.F. Lopez, D. Raychaudhury. *On partially ample Ulrich bundles*. **Adv. Geom.**, to appear. arXiv:2403.18928 [arXiv]
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. DOI: 10.1112/jlms.70030 [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. DOI: 10.1112/plms.12635 [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. DOI: 10.1090/proc/16986 [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. DOI: 10.1515/advgeom-2023-0028 [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. DOI: 10.1007/s00229-023-01530-2 [journal] [arXiv]
8. A.F. Lopez, D. Raychaudhury. *On varieties with Ulrich twisted tangent bundles*. **Ann. Mat. Pura Appl.** 203 (2024), 1159–1193. DOI: 10.1007/s10231-023-01397-w [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. DOI: 10.1007/s13163-023-00462-5 [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. DOI: 10.1007/s40879-023-00703-3 [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. DOI: 10.1090/proc/15934 [journal] [arXiv]
4. J. Mukherjee, D. Raychaudhury. *Smoothing of multiple structures on embedded Enriques manifolds*. **Math. Z.** 300 (2022), no. 2, 1241–1263. DOI: 10.1007/s00209-021-02818-3 [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. DOI: 10.1142/S0129167X21500324 [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. DOI: 10.1016/j.jpaa.2020.106383 [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. DOI: 10.1016/j.jalgebra.2019.08.026 [journal] [arXiv]

## PREPRINTS

6. A.F. Lopez, D. Raychaudhury. *A lower bound on the Ulrich complexity of hypersurfaces.* (2025) arXiv:2503.13396 [[arXiv](#)]
5. B. Dirks, S. Olano, D. Raychaudhury. *A Hodge theoretic generalization of  $\mathbb{Q}$ -homology manifolds.* (2025) arXiv:2501.14065 [[arXiv](#)]
4. G.V. Ravindra, D. Raychaudhury. *Extendable codimension two subvarieties in a general hypersurface.* (2024) [[pdf](#)]
3. S. Olano, D. Raychaudhury. *On the local cohomology of secant varieties.* (2024) arXiv:2407.16688 [[arXiv](#)]
2. A.F. Lopez, D. Raychaudhury. *Non-existence of low rank Ulrich bundles on Veronese varieties.* (2024) arXiv:2406.08162 [[arXiv](#)]
1. A.F. Lopez, D. Raychaudhury. *Ulrich subvarieties and the non-existence of low rank Ulrich bundles on complete intersections.* (2024) arXiv:2405.01154 [[arXiv](#)]

## SHORT RESEARCH VISITS

- |   |           |
|---|-----------|
| • Università degli Studi Roma Tre, Rome, Italy<br><i>Visiting Angelo Felice Lopez</i> | Sep. 2024 |
| • University of Leiden, Leiden, The Netherlands<br><i>Visiting Yajnaseni Dutta</i>    | Sep. 2024 |

## INVITED TALKS

### CONFERENCES.....

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|---|-----------|
| • Saint Louis University, St. Louis, MO<br>AMS 2025 Fall Central Sectional Meeting<br>– <i>Special Session on Commutative algebra, Hodge theory, Singularities</i>  | Oct. 2025 |
| • Tulane University, New Orleans, LA<br>AMS 2025 Fall Southeastern Sectional Meeting<br>– <i>Special Session on Syzygies and Local Cohomology in Commutative Algebra</i>  | Oct. 2025 |
| • University of Wisconsin–Madison, Madison, WI<br><i>Singularities in the Midwest, IX</i>   | Apr. 2025 |
| • University of Kansas, Lawrence, KS<br>AMS 2025 Spring Central Sectional Meeting<br>– <i>Special Session on Topics in Classical Algebraic Geometry</i><br>– <i>Special Session on Interplay between Birational Geometry, Complex Geometry and Hodge Theory</i> | Mar. 2025 |
| • University of California Riverside, Riverside, CA<br>AMS 2024 Fall Western Sectional Meeting<br>– <i>Special Session on Moduli</i>  | Oct. 2024 |
| • Georgia Southern University, Savannah, GA ( <i>Cancelled due to Hurricane Helene</i> )<br>AMS 2024 Fall Southern Sectional Meeting<br>– <i>Special Session on Topics in Commutative Algebra and Algebraic Geometry</i>  | Oct. 2024 |
| • Canadian Mathematical Society Winter Meeting 2023, Montreal, QC<br>– <i>Session: Algebraic, Arithmetic and Kähler Geometry: Recent developments</i>   | Dec. 2023 |

- 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)*

#### SEMINARS AND COLLOQUIA.....

- Harvard University, Cambridge, MA Sep. 2025  
*Harvard-MIT Algebraic Geometry Seminar*
- Notre Dame University, Notre Dame, IN Sep. 2025  
*Notre Dame Algebraic Geometry/Commutative Algebra Seminar*
- Arizona State University, Tempe, AZ Mar. 2025  
*Number Theory and Algebra Seminar*
- Colorado State University, Fort Collins, CO Feb. 2025  
*FRAGMENT Seminar*
- 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*
- 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*

#### CONTRIBUTED TALKS

- University of Arizona, Tucson, AZ 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) 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 413/513 – Linear Algebra (Spring 2025)
- MATH 313 – Introduction to Linear Algebra (Spring 2024, Fall 2025)
- MATH 243 – Discrete Mathematics for Computer Science (Fall 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

- *Postdoc Summer Grant* 2025  
University of Arizona
- *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

- *2025 Summer Research Institute in Algebraic Geometry* Jul. 2025  
Colorado State University, Fort Collins, CO
- *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*  
Stony Brook University, Stony Brook, NY

Aug. 2017

## SERVICE AND OUTREACH

- Mentor for Undergraduate Teaching Assistant Program at the University of Arizona      Fall 2024
- Secretary of Graduate Student Organization at the University of Kansas      2019 – 2020

## MEMBERSHIPS

- Member of the American Mathematical Society

## COMPUTING AND LANGUAGES

PROGRAMMING LANGUAGES: C++, Python, Haskell, Java, Mathematica

LANGUAGES: English (second language), Bengali (native)

(July 20, 2025)