

# DEBADITYA RAYCHAUDHURY

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## CONTACT INFORMATION

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## 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 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

11. V. Antonelli, G. Casnati, A.F. Lopez, D. Raychaudhury. *On varieties with Ulrich twisted conormal bundles*. **Proc. Amer. Math. Soc.**, to appear. arXiv:2306.00113 (2023) [[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. G.V. Ravindra, D. Raychaudhury. *Extendable codimension two subvarieties in a general hypersurface*. (2024) [[pdf](#)]
6. S. Olano, D. Raychaudhury. *On the local cohomology of secant varieties*. (2024) arXiv:2407.16688 [[arXiv](#)]
5. A.F. Lopez, D. Raychaudhury. *Non-existence of low rank Ulrich bundles on Veronese varieties*. (2024) arXiv:2406.08162 [[arXiv](#)]
4. A.F. Lopez, D. Raychaudhury. *Ulrich subvarieties and the non-existence of low rank Ulrich bundles on complete intersections*. (2024) arXiv:2405.01154 [[arXiv](#)]
3. A.F. Lopez, D. Raychaudhury. *On partially ample Ulrich bundles*. (2024) arXiv:2403.18928 [[arXiv](#)]
2. S. Olano, D. Raychaudhury, L. Song. *Singularities of secant varieties from a Hodge theoretic perspective*. (2023) arXiv:2310.09391 [[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](#)]

## PRESENTATIONS

### 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*
- Indian Institute of Science, *Algebra & Combinatorics Seminar*, Bengaluru, India Jun. 2024
- Chennai Mathematical Institute, *Mathematics Seminar*, Chennai, India Jun. 2024
- Indian Institute of Technology Bombay, *Mathematics Seminar*, Mumbai, India May 2024
- Oklahoma State University, *Department Colloquium*, Stillwater, OK Apr. 2024
- 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  
Scientific Session: *Algebraic, Arithmetic and Kähler Geometry: Recent developments*
- University of Arkansas, *Algebra Seminar*, Fayetteville, AR Oct. 2023
- University of Toronto, *Algebraic Geometry Seminar*, Toronto, ON Nov. 2022
- Queen's University, *Algebra and Geometry Seminar*, Kingston, ON Oct. 2022
- Fields Institute, *Fields Number Theory Seminar*, Toronto, ON Oct. 2022
- Fields Institute, *Fields Postdoc Colloquium*, Toronto, ON Jan. 2022
- University of Nebraska-Lincoln, *URiCA-KUMUNUjr*, Lincoln, NE (Cancelled) Apr. 2020
- University of Illinois Chicago, Chicago, IL Mar. 2019  
*Midwest Algebraic Geometry Graduate Conference (MAGGC)*

### CONTRIBUTED TALKS .....

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

### POSTER PRESENTATIONS .....

- University of Michigan, *Singularities in Ann Arbor*, Ann Arbor, MI May 2024
- 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, *Algebraic Geometry in Roma Tre*, Rome, Italy Jun. 2022  
*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, *Southwest Local Algebra Meeting (SLAM)*, Fayetteville, AR Feb. 2018

## TEACHING EXPERIENCES

### UNIVERSITY OF ARIZONA - INSTRUCTOR .....

- MATH 243 – Discrete Mathematics (Spring 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*, University of Kansas 2020  
(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
- *U.G. Mitchell Graduate Summer Scholarship*, University of Kansas 2018, 2020
- *Graduate Scholarship*, Chennai Mathematical Institute 2013 – 2015
- *INSPIRE Scholarship for Higher Education (SHE)* 2010 – 2013  
Department of Science and Technology, Govt. of India

## ORGANIZING

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

## REFEREING 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
- *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  
(Fully funded invited participant, attended virtually)
- *MPS Conference on Higher Dimensional Geometry* Feb. 2022  
Simons Center for Geometry and Physics, Stony Brook, NY  
(Fully funded invited participant, attended virtually)
- *Hodge Theory, Moduli and Representation Theory*, Stony Brook University, NY Aug. 2017
- *AIS (Advanced Instructional School) Schemes and Cohomology* Dec. 2014  
Kerala School of Mathematics, India

## OTHER CONFERENCES ATTENDED

- *Algebraic Geometry Northeastern Series (AGNES)*, Boston College, Boston, MA Mar. 2024
- *Spec( $\mathbb{Q}$ )*, Fields Institute, Toronto, ON Jul. 2022
- *I-70 Algebraic Geometry Symposium*, University of Missouri-St. Louis, St. Louis, MO Oct. 2018
- *Midwest Algebraic Geometry Graduate Conference (MAGGC)*, UIC, Chicago, IL May 2018
- *I-70 Algebraic Geometry Symposium*, University of Kansas, Lawrence, KS Nov. 2017
- *42nd Annual Spring Lecture Series on Geometry* Mar. 2017  
University of Arkansas, Fayetteville, AR
- *I-70 Algebraic Geometry Symposium*, University of Missouri, Columbia, MO Nov. 2016
- *KUMUNU 2016*, University of Kansas, Lawrence, KS Oct. 2016
- *KUMUNU 2015*, University of Missouri, Columbia, MO Oct. 2015

## 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)

(August 6, 2024)