

# DEBADITYA RAYCHAUDHURY

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## EMPLOYMENT

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

## EDUCATION

University of Kansas	Lawrence, KS, USA
<i>Ph.D. in Mathematics</i>	2015 – 2021
<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>	
University of Kansas	Lawrence, KS, USA
<i>M.A. in Mathematics</i>	2015 – 2016
Chennai Mathematical Institute	Chennai, TN, India
<i>M.Sc. in Mathematics</i>	2013 – 2015
Chennai Mathematical Institute	Chennai, TN, India
<i>B.Sc. (Hons.) in Mathematics and Computer Science</i>	2010 – 2013

## 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

- (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](#)]
- (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](#)]
- (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](#)]
- (4) J. Mukherjee, D. Raychaudhury. *Smoothing of multiple structures on embedded Enriques manifolds*. **Math. Z.** 300 (2022), no. 2, 1241–1263. [[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](#)]
- (6) 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.** (2023). [[journal](#)] [[arXiv](#)]
- (7) P. Kundu, J. Mukherjee, D. Raychaudhury. *Tautological families of cyclic covers of projective spaces*. **Eur. J. Math.** 9 (2023), no. 4, 118. [[journal](#)] [[arXiv](#)]
- (8) A.F. Lopez, D. Raychaudhury. *On varieties with Ulrich twisted tangent bundles*. **Ann. Mat. Pura Appl.** (2023). [[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.** (2024). [[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](#)]

## PREPRINTS

- (11) 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](#)]
- (12) V. Antonelli, G. Casnati, A.F. Lopez, D. Raychaudhury. *On varieties with Ulrich twisted conormal bundles*. (2023) arXiv:2306.00113 [[arXiv](#)]
- (13) S. Olano, D. Raychaudhury, L. Song. *Singularities of secant varieties from a Hodge theoretic perspective*. (2023) arXiv:2310.09391 [[arXiv](#)]
- (14) A.F. Lopez, D. Raychaudhury. *On partially ample Ulrich bundles*. (2024) arXiv:2403.18928 [[arXiv](#)]

## PRESENTATIONS

### INVITED TALKS .....

- 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 .....

- Washington University, *Western Algebraic Geometry Symposium (WAGS)*, St. Louis, MO Nov. 2023
- 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, *Western Algebraic Geometry Symposium (WAGS)*, Salt Lake City, UT Nov. 2019
- University of Arkansas, *Southwest Local Algebra Meeting (SLAM)*, Fayetteville, AR Feb. 2018

### FELLOWSHIPS AND GRANTS

- Conference grant: *CAAGTUS (Commutative Algebra and Algebraic Geometry in TUCSon)* 2024  
(P.I., NSF Award Number 2412921, \$15,000, Co-P.I.s: Zhengning Hu, Arvind Suresh).
- *Simons Postdoctoral Fellowship*, Fields Institute 2021 – 2022

### TEACHING EXPERIENCES

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

- 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*, University of Kansas 2018, 2019, 2021  
(An award limited to 5 nominees and 1 winner per year)
- *U.G. Mitchell Graduate Summer Scholarship*, University of Kansas 2020, 2018
- *Graduate Scholarship*, Chennai Mathematical Institute 2013 – 2015
- *INSPIRE Scholarship for Higher Education (SHE)*, Department of Science and Technology, Govt. of India 2010 – 2013

## ORGANIZING

- CO-ORGANIZER: *CAAGTUS*, University of Arizona May 2024
- CO-ORGANIZER: *Algebraic Geometry Seminar*, University of Arizona 2023 – 2024
- CO-ORGANIZER: *Geometry Seminar*, University of Kansas 2019 – 2021

## REFEREEING AND REVIEWING

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

## PARTICIPATION IN SPECIAL PROGRAMS

- *Workshop on Lefschetz Properties in Algebra, Geometry, Topology and Combinatorics* May 2023  
Fields Institute, Toronto, ON
- *Birational Complexity of Algebraic Varieties*, Simons Center for Geometry and Physics Dec. 2022  
(Fully funded invited participant, attended virtually)
- *MPS Conference on Higher Dimensional Geometry*, Simons Center for Geometry and Physics Feb. 2022  
(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( $\overline{\mathbb{Q}}$ )*, 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*, University of Arkansas, Fayetteville, AR Mar. 2017
- *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: Fluent in English (second language), Bengali (native)

(Last updated: March, 2024)