DEBADITYA RAYCHAUDHURY

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CONTACT ADDRESS

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

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

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. 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]

(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]

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

(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]

(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]

PREPRINTS

(12) 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]

(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]

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

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

PRESENTATIONS

INVITED TALKS..

- AMS 2024 Fall Western Sectional Meeting, University of California Riverside, Riverside, CA   Oct. 2024
  Special Session on Moduli

- AMS 2024 Fall Southern Sectional Meeting, Georgia Southern University, Savannah, GA   Oct. 2024
  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, *Western Algebraic Geometry Symposium (WAGS)*, Davis, CA   Apr. 2024
- 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)

Uɴɪᴠᴇʀsɪᴛʏ ᴏꜰ Kᴀɴsᴀs - Rᴇᴄɪᴛᴀᴛɪᴏɴ Iɴsᴛʀᴜᴄᴛᴏʀ..
- MATH 126 – Calculus II (Spring 2019, Fall 2020)
- MATH 125 – Calculus I (Spring 2017, Fall 2017)

Aᴡᴀʀᴅs ᴀɴᴅ Hᴏɴᴏʀs

- *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
- *U.G. Mitchell Graduate Summer Scholarship*, University of Kansas   2020, 2018
- *Graduate Scholarship*, Chennai Mathematical Institute   2013 – 2015
- *INSPIRE Scholarship for Higher Education (SHE)*, DST, Govt. of India   2010 – 2013

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- Cᴏ-ᴏʀɢᴀɴɪᴢᴇʀ: *Western Algebraic Geometry Symposium (WAGS)*, University of Arizona   Nov. 2024
- Cᴏ-ᴏʀɢᴀɴɪᴢᴇʀ: *CAAGTUS*, University of Arizona   May 2024
- Cᴏ-ᴏʀɢᴀɴɪᴢᴇʀ: *Algebraic Geometry Seminar*, University of Arizona   2023 – 2024
- Cᴏ-ᴏʀɢᴀɴɪᴢᴇʀ: *Geometry Seminar*, University of Kansas   2019 – 2021

Rᴇꜰᴇʀᴇᴇɪɴɢ ᴀɴᴅ Rᴇᴠɪᴇᴡɪɴɢ

- Rᴇꜰᴇʀᴇᴇ: *Communications in Algebra*
- Rᴇᴠɪᴇᴡᴇʀ: *zbMATH*   2020 – Present

Pᴀʀᴛɪᴄɪᴘᴀᴛɪᴏɴ ɪɴ Sᴘᴇᴄɪᴀʟ Pʀᴏɢʀᴀᴍs

- *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

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- *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)