DEBADITYA RAYCHAUDHURY

rcdeba@gmail.com · draychaudhury@math.arizona.edu · https://rcdeba.github.io

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 – 2024

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 (ADVISOR: Prof. Purnaprajna Bangere) — 2015 – 2021

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.

PUBLICATIONS AND PREPRINTS

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.**, to appear. [journal] [arXiv]

(7) D. Raychaudhury. *Continuous CM–regularity and generic vanishing* with an appendix by A. Ito. **Adv. Geom.**, to appear. arXiv:2208.13096 [arXiv]

(8) P. Kundu, J. Mukherjee, D. Raychaudhury. *Tautological families of cyclic covers of projective spaces*. **Eur. J. Math.**, to appear. arXiv:2111.06043 [arXiv]

PREPRINTS

(9) P. Bangere, J. Mukherjee, D. Raychaudhury. *Koszul property of Ulrich bundles and rationality of moduli spaces of stable bundles on Del Pezzo surfaces*. Preprint 2022, arXiv:2202.13631 [arXiv]

(10) 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*. Preprint 2022, arXiv:2012.01682 [arXiv]

(11) A.F. Lopez, D. Raychaudhury. *On varieties with Ulrich twisted tangent bundles*. Preprint 2023, arXiv:2301.03104 [arXiv]

(12) V. Antonelli, G. Casnati, A.F. Lopez, D. Raychaudhury. *On varieties with Ulrich twisted conormal bundles*. Preprint 2023, arXiv:2306.00113 [arXiv]

(13) S. Olano, D. Raychaudhury, L. Song. *Singularities of secant varieties from a Hodge theoretic perspective*. Preprint 2023, arXiv:2310.09391 [arXiv]

PRESENTATIONS

RESEARCH TALKS

- Canadian Mathematical Society Winter Meeting 2023 *(upcoming)*, Montreal, QC — Dec. 2023
  Scientific Session: *Algebraic, Arithmetic and Kähler Geometry: Recent developments*
- University of Arkansas, *Algebra Seminar (upcoming)*, Fayetteville, AR — Oct. 2023
- University of Arizona, *Algebraic Geometry Seminar*, Tucson, AZ — Sep. 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 Illinois Chicago, *(Online lightning talk)*, Chicago, IL — May 2020
  Midwest Algebraic Geometry Graduate Conference
- University of Nebraska-Lincoln, *URiCA-KUMUNUjr*, Lincoln, NE (**cancelled**) — Apr. 2020
- University of Kansas, *Geometry Seminar* Lawrence, KS — Nov. 2019
- University of Illinois Chicago, Chicago, IL — Mar. 2019
  Midwest Algebraic Geometry Graduate Conference
- University of Kansas, *Geometry Seminar*, Lawrence, KS — Sep. 2018

POSTER PRESENTATIONS

- Washington University, *Western Algebraic Geometry Symposium (upcoming)*, 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*, Salt Lake City, UT — Nov. 2019
- University of Arkansas, *Southwest Local Algebra Meeting*, Fayetteville, AR — Feb. 2018

Teaching Experiences

University of Arizona (Instructor)

- 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

- *Simons Postdoctoral Fellowship*, Fields Institute — 2021 – 2022
- *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)*, — 2010 – 2013
  Department of Science and Technology, Govt. of India

Other Conferences and Workshops Attended

- *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)
- *Spec*($\overline{\mathbb{Q}}$), Fields Institute, Toronto, ON — Jul. 2022
- *MPS Conference on Higher Dimensional Geometry* — Feb. 2022
  (Fully funded invited participant, attended virtually)
- *I-70 Algebraic Geometry Symposium*, University of Missouri-St. Louis, St. Louis, MO — Oct. 2018
- *Midwest Algebraic Geometry Graduate Conference (MAGGC 2018)*, UIC, Chicago, IL — May 2018
- *I-70 Algebraic Geometry Symposium*, University of Kansas, Lawrence, KS — Nov. 2017
- *Hodge Theory, Moduli and Representation Theory*, Stony Brook University, NY — Aug. 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
- *AIS (Advanced Instructional School) Schemes and Cohomology* — Dec. 2014
  Kerala School of Mathematics, India

Professional Services

- Referee: *Communications in Algebra*
- Reviewer: *zbMATH* — 2020 – Present
- Co-organizer: *Algebraic Geometry Seminar*, University of Arizona — 2023 – 2024
- Co-organizer: *Geometry Seminar*, University of Kansas — 2019 – 2021
- 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: October, 2023)