Sarasij Maitra

Curriculum Vitae

Department of Mathematics and Statistics, Haverford College
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Education

2025–Present **Visiting Assistant Professor**, *Haverford College*
2022–2025 **Postdoctoral Researcher/Lecturer**, *University of Utah*
2016–2022 **PhD in Mathematics**, *University of Virginia*
2014–2016 **M.Math**, *Indian Statistical Institute*, Kolkata
2011–2014 **B.Math**, *Indian Statistical Institute*, Bangalore

Papers and Preprints

- **Unstable elements in cohomology and a question of Lescot** with S. B. Iyengar and T. Tribone
- **A family of simplicial resolutions which are DG-algebras** with J. Cameron, T. Chau, T. Tribone
- **Annihilators of (co)homology and their influence on the trace Ideal** with J. Lyle (Submitted)
- **Two Criteria for Quasihomogeneity** with V. Mukundan; Proceedings of the American Mathematical Society 152.06 (2024): 2369-2375.
- **Extremal behavior of reduced type of one dimensional rings** with V. Mukundan (Submitted)
- **Partial Trace Ideals, Torsion and Canonical Module**; Journal of Algebra, 652: 1- 19, 2024.
- **Valuations and Nonzero Torsion in Module of Differentials** with V. Mukundan; Bulletin des Sciences Mathématiques, Volume 187, October 2023, 103287
- **Finding Points On Varieties with *MACAULAY2*** with S. Bisui, T. T. Nguyễn, Z. Jiang and K. Schwede; Journal of Software for Algebra and Geometry, Vol 13 (2023), 33-43
- **On Reflexive and I-Ulrich Modules over Curve Singularities**, with H. Dao and P. Sridhar; Trans. Amer. Math. Soc. Ser. B 10 (2023), 355-380
- **Traceable PRFs: Full Collusion Resistance and Active Security** with D. J. Wu; **PKC 2022**
- **Partial Trace Ideals and Berger's Conjecture**; Journal of Algebra, 598: 1–23, 2022.
- **Torsion in Differentials and Berger's Conjecture** with C. Huneke and V. Mukundan; Res Math Sci 8, 60 (2021)

Awards and Achievements

- **Outstanding Teaching Postdoc in Mathematics, University of Utah, 2025**
- **AMS–Simons Travel Grant 2023–2025**
- **The Joint Mathematics Meetings 2022 Travel Grant** (Later shifted to a virtual venue)
- **Jefferson Scholars Foundation Research Prize, 2021.**
- **All-University Graduate Teaching Award, University of Virginia, 2019-2020**.
- (2019) Travel Grant for Mathematical Sciences Research Institute 883 Commutative Algebra and its Interaction with Algebraic Geometry.
- 1^{st} Division with Distinction in M. Math.
- 1^{st} Division with Distinction in B. Math.

Mentoring Experience

2022-2023 **AWM Mentor to Jacob Strong**, *Undergraduate, University of Utah*, Biweekly meetings to discuss various mathematical as well as career exploration topics

2022-2023 **AWM Mentor to Macy Dattile**, *Undergraduate, University of Utah*, Biweekly meetings to discuss various mathematical as well as career exploration topics

2024-2025 **AWM Mentor to Yuvraj Malik**, *Undergraduate, University of Utah*, Biweekly meetings to discuss various mathematical as well as career exploration topics

2024-2025 **Research Experiences For Undergraduates (REU) with William Zhang**, *Undergraduate, University of Utah*, Independent reading/research on Group Theory from *Abstract Algebra by Dummit & Foote* and applications of groups in Cryptography; Trace ideals in Numerical Semigroup Rings; sponsored by the Univ. of Utah Mathematics department with a student stipend of $1500-$2000

Conferences and Seminars Organized

Spring 2024 **Commutative Algebra Seminar**, University of Utah, Co-organizers: Eamon Quinlan-Gallego, Karl Schwede

April 2024 **MATH FOR ALL in Salt Lake City, Utah**, University of Utah, Co-organizers: P. Mcdonald, T. Tribone

2023 **University of Utah MathCircle**, University of Utah, Co-organizers: A. Borisyuk, K. Vinhage, X. Shen

October 2022 **AMS Special Session on Building Bridges Between Commutative Algebra and Nearby Areas**, *Fall Western Sectional Meeting*, University of Utah, Co-organizers: J. Cameron, T. Tribone

Service

- High School Sectional Leader, Mathcircle University of Utah, Spring and Fall 2023
- Reviewer for various mathematics journals
- Graduate Teaching Mentor at the University of Virginia, 2020-2021

- AWM Mentor at the University of Utah, 2022-2024

Software

- *RandomPoints*, (Macaulay 2), with S. Bisui, T. T. Nguyễn, Z. Jiang, K. Schwede.
- *SwitchingFields*, (Macaulay 2), with Z. Jiang.

Invited Talks and Poster Presentations

July 2025 **Discussions on Berger's Conjecture**, *Recent Developments in Commutative Algebra*, Mathematical Congress of the Americas 2025, Miami, FL

October 2024 **On Nearly Gorenstein Rings and a Generalization of a Conjecture of Tachikawa**, *Special Session on Singularities in commutative algebra*, 2024 Fall Eastern Sectional Meeting, University at Albany, Albany, NY

October 2024 **On Nearly Gorenstein Rings and a Generalization of a Conjecture of Tachikawa**, *Special Session on Topics in Commutative Algebra and Algebraic Geometry*, 2024 Fall Southeastern Sectional Meeting, Georgia Southern University, Savannah, GA

September 2024 **Reduced type of one dimensional complete local domains**, *AMS Special Session on Commutative algebra and connections to combinatorics*, 2024 Fall Central Sectional Meeting, University of Texas – San Antonio

January 2024 **Extremal Behaviour of Reduced Type**, *Recent Developments in Commutative Algebra*, Joint Mathematics Meetings, San Francisco, CA

April 2023 **On the reduced type of one dimensional analytic k-algebras**
Morgantown Algebra Days (MAD), West Virginia University

April 2023 **The Frobenius Problem**
MathCircle, Salt Lake City, University of Utah

February 2023 **Frobenius Problem and Numerical Semigroup Rings**
Math for All, Salt Lake City, University of Utah

Februrary 2023 **Module of Differentials and Berger's Conjecture**
Algebra Seminar, University of Georgia

October 2022 **Discussions on Berger's Conjecture**
Commutative Algebra Seminar, University of Utah

April 2022 **Notes On Berger's Conjecture**
Graduate Seminar, University of Virginia

April 2022 **On Reflexive and I-Ulrich Modules**, *AMS Special Session on Commutative Algebra*, Joint Mathematics Meetings

March 2022 **Torsion in Module of Differentials**, *Special Session on Recent Developments in Commutative Algebra*, AMS Spring Central Sectional Meeting at Purdue University, West Lafayette, IN

March 2022 **Traceable PRFs: Full Collusion Resistance and Active Security**
PKC, Japan (virtual)

January 2022 **Partial Trace Ideals and Berger's Conjecture**
Virtual Commutative Algebra Seminar, University of Illinois at Chicago

April 2021 **Discussions on I-Ulrich Modules**
Virtual Commutative Algebra Seminar, Purdue University

April 2021 **An Introduction To Gröbner Bases**, *(Joint Talk with Stephanie Shand)*
Graduate Seminar, University of Virginia

February 2021 **Discussions on I-Ulrich Modules**
Algebra Seminar, West Virginia University

January 2021 **Discussions on Berger's Conjecture**
Joint Mathematics Meetings

October 2020 **A Study of Colength in Dimension One**
Commutative and Homological Algebra Market Presentations (CHAMP)

June 2020 **Poster: An Approach to Berger's Conjecture**
Early Commutative Algebra Researchers (eCARs)

June 2020 **A Simple Study of Colength**
Graduate Student Seminar, New Mexico State University

March 2020 **"Berger's Conjecture from the Viewpoint of an Invariant of the Module of Differentials"–An Approach to Berger's Conjecture**
A Zoom Session on Commutative Algebra

Teaching

Fall 2025 **Visiting Assistant Professor**, *Haverford College*
MATH 121A04-05 Multivariable Calculus, MATH 390: Commutative Algebra

Spring 2025 **Assistant Professor (Lecturer)**, *University of Utah*
MATH 3210-002 Foundations of Real Analysis I

Fall 2024 **Assistant Professor (Lecturer)**, *University of Utah*
MATH 2270-001,006 Linear Algebra

Spring 2024 **Assistant Professor (Lecturer)**, *University of Utah*
MATH 2270-001 Linear Algebra

Fall 2023 **Assistant Professor (Lecturer)**, *University of Utah*
MATH 1090-003, MATH 1090-006 Business Algebra

Spring 2023 **Assistant Professor (Lecturer)**, *University of Utah*
MATH 3150-004 PDE's for Engineers

Fall 2022 **Assistant Professor (Lecturer)**, *University of Utah*
MATH 1321-001 Accelerated Engineering Calculus II

Spring 2022 **Graduate Teaching Instructor**, *University of Virginia*
MATH 1310-400 Calculus I (Flipped Model)

Fall 2021 **Graduate Teaching Instructor**, *University of Virginia*
MATH 1410-001 Financial Mathematics

Fall 2020 **Graduate Teaching Instructor**, *University of Virginia*
MATH 1320-200 Calculus II (Online Flipped Model)

Fall 2019 **Graduate Teaching Instructor**, *University of Virginia*
MATH 1310-001 Calculus I (Flipped Model)

Spring 2019 **Graduate Teaching Instructor**, *University of Virginia*
MATH 1220-009 A Survey of Calculus II

Spring 2018 **Graduate Teaching Instructor**, *University of Virginia*
MATH 1210-008 A Survey of Calculus I

Fall 2017 **Graduate Teaching Instructor**, *University of Virginia*
MATH 1210-007 A Survey of Calculus I

Spring 2017 **Graduate Teaching Assistant**, *University of Virginia*
MATH 1310-100 Calculus I, MATH 3250-300 Ordinary Differential Equations

Fall 2016 **Graduate Teaching Assistant**, *University of Virginia*
MATH 1310-500, MATH 1310-700 Calculus I

Memberships

- Association for Women in Mathematics (AWM)
- American Mathematical Society (AMS)

Other Projects

Summer 2024 Deep learning project on Detecting Skin Cancer using Image Processing – The Erdös Institute

Summer 2024 Data Science project on Predicting house prices in King County, WA – The Erdös Institute [LINK]

Jan - May, 2016 Project on *Bargaining Games with Time-Independent and Time-Dependent Preferences* under Prof. Souvik Roy of Indian Statistical Institute, Kolkata. [Project Report]

Dec, 2014 Reading Project on *Hopf Algebra* under Prof. Jyotishman Bhowmick of Indian Statistical Institute, Kolkata.

May - July, 2013 Indian Academy of Sciences Summer Project on *Algebraic Geometry* under Prof. Kapil Hari Paranjape at Indian Institute of Science Education and Research, Mohali. [Project Report]

Skills

Language Skills: English, Bengali, Hindi

Technologies: Macaulay 2, LaTeX, MATLAB, Python, Jupyter Notebooks