DIPENDRANATH MAHATO (he/him/his)

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EDUCATION

- **Doctor of Philosophy** — August 2021 – Present
  Mathematics, Advisor: Dr. Tài Huy Hà — **Tulane University, United States**

- **Master of Science** — July 2018 – July 2020
  Major in Mathematics, Advisor: Dr. D. K. Basnet — **Tezpur University, India**

- **Bachelor of Science** — August 2013 – April 2017
  Honours in Mathematics — **University of Calcutta, India**

RESEARCH INTERESTS

Commutative Algebra ∘ Algebraic Combinatorics ∘ Algebraic Geometry

- Interpolation Problem in Projective Spaces
- Algebraic and Combinatorial Properties of Various Ideals

AWARDS & HONOURS

- **Phillips Distinguished Graduate Research Fellowship** — 2025-2026
  Department of Mathematics, Tulane University — *New Orleans, Louisiana*

- **2nd Place in Poster Session Contest** — July 2025
  Mathematical Congress of the Americas (MCA 2025) — *Miami, Florida*

PUBLICATIONS & PREPRINTS

- **Rational Symbolic Power of Ideals** — (Preprint) ⌨ arXiv:2511.02732
  with *S. Dey, T. Ha* — *Status: Submitted*

- **Demailly's Conjecture for general and very general points** — (Preprint) ⌨ arXiv:2409.08535
  with *S. Bisui* — *Status: Submitted*

∘ **Ongoing Projects**

- **k-Configurations in $\mathbb{P}^N$** — with S. Bisui, T. T. Nguyen
- **v-number of some Ideals** — with M. Kumar
- **Points in Multi-Projective Spaces** — with E. Guardo

∘ **Dissertations**

- **Insight into Gaussian Sums and its Application** — Submission
  Master's Thesis — *Defended: June 17, 2020*

TEACHING EXPERIENCES

- <u>**Instructor of Records**</u> — **Tulane University**

  - *MATH 1210: Calculus I* — *Summer 2025*
  - *MATH 1210: Calculus I* — *Fall 2024*

- **Teaching Assistant** — **Tulane University**

  - *MATH 1210: Calculus I* — *Fall 2021, Spring 2025, Fall 2025*
  - *MATH 1220: Calculus II* — *Spring 2022*
  - *MATH 1230: Stats for Scientists* — *Fall 2022, Spring 2024*
  - *MATH 3050/6050: Real Analysis* — *Spring 2023*
  - *MATH 3090/6090: Linear Algebra* — *Fall 2023*
  - *CMPS/MATH 2170: Discrete Mathematics* — *Fall 2023*
  - *MATH 1100: Introduction to Probability and Statistics* — *Summer 2023, Summer 2024*

- **Mentor** — **Directed Reading Programs**

  - *Nikhil S. Kumar (NIT-Tiruchirappalli, India) - In Continuation* — *TWOPLES- Fall 2025*
  - *Imdadul Hussain (Tezpur University, India) - An Introduction to symbolic powers* — *TWOPLES- Spring 2025*

INVITED TALKS & POSTER PRESENTATIONS

○ **Invited & Seminar Talks**

- **Unfolding the Rational Symbolic Powers of Ideals** — Joint Mathematics Meetings 2026
  Walter E. Washington Convention Center (Special Session) — *January 04-07, 2026*

- **Introduction to Rational Symbolic Powers** — Graduate Colloquium
  Department of Mathematics, Tulane University — *November 11, 2025*

- **Unfolding the Rational Symbolic Powers of Ideals** — AMS Fall Central Meeting 2025
  Saint Louis University (Special Session) — *October 18, 2025*

- **Interpolation Problem and Recent Studies on Demailly's Conjecture** — AMS Spring Western Meeting 2025
  California Polytechnic State Univeristy (Special Session) — *May 03, 2025*

- **Macaulay2 Workshop (Lightning Talk)** — Macaulay2 at Tulane 2025
  Department of Mathematics, Tulane University — *April 18, 2025*

- **Interpolation in Projective Spaces (Lightning Talk)** — Commutative Algebra in The South (CATS) 2025
  Department of Mathematics, Georgia State University — *April 06, 2025*

- **Interpolation of Projective Points under Algebraic Lens** — Math For All Virtual 2025
  Virtual — *April 05, 2025*

- **Interpolation Problem and Recent Studies on Demailly's Conjecture** — AMS Spring Central Meeting 2025
  University of Kansas (Special Session) — *March 29, 2025*

- **Developments in Interpolation Problem for Projective Spaces** — Algebra & Combinatorics Seminar
  Department of Mathematics, Tulane University — *March 14 (π-Day), 2025*

- **Interpolation Problem: Conjectures & New Developments** — CMSA-2025
  Department of Mathematical Sciences, Tezpur University — *January 03, 2025*

- **Recent Developments in Interpolation Problems & Demailly's Conjecture** — Graduate Colloquium
  Department of Mathematics, Tulane University — *November 05, 2024*

- **Overview of Generalized Interpolation Problem & its Algebraic Components** — TU Alumni Talk
  Department of Mathematical Sciences, Tezpur University — *May 24, 2024*

- **Generalized Interpolation Problems and Chudnovsky's Conjecture** — Graduate Colloquium
  Department of Mathematics, Tulane University — *April 25, 2023*

- **Algebraic Gaussian Sums and its Applications** — Graduate Colloquium
  Department of Mathematics, Tulane University — *October 04, 2022*

- **Poster Presentations**

  - **Interpolation of Projective Points & Demailly's Conjecture**
    - *MCA 2025*, Miami [**2nd** *Best Presentation*]   *July 21-25, 2025*
    - *TRICS 2025*, Tulane University   *April 08-10, 2025*
    - *CATS 2025*, Georgia State University   *April 05-06, 2025*
    - *SLAM 2025*, Arizona State University   *March 01-02, 2025*
    - *KUMUNU 2024*, University of Missouri   *September 28-29, 2024*

SEMINARS/CONFERENCES (CO-)ORGANIZED

- **American Mathematical Society: Sectional Meeting**   **Special Session on Commutative Algebra**
  2025 Fall Eastern Virtual Sectional Meeting   *Co-organizer: Souvik Dey*

- **American Mathematical Society: Sectional Meeting**   **Special Session on Commutative Algebra**
  2025 Fall Southeastern Sectional Meeting at Tulane University   *Co-organizers: Tài Huy Hà and Kuei-Nuan Lin*

- **Tulane University Research Talks (Mathematics)**   **AMS/AWM Faculty Talks**
  Fall 2023 & Spring 2024   *Co-organizer: Rebecca Kahler*

RESEARCH & TRAVEL SUPPORT

- **Research Support**

  - *Summer Research Support from Department of Mathematics, Tulane University*   *Summer 2022-2025*

- **Travel Supports**

  - *AMS Graduate Student Travel Grant for Central Sectional Meeting at Saint Louis University*   *Fall 2025*
  - *AMS Travel Grant for Mathematical Congress of the Americas (MCA) 2025*   *Summer 2025*
  - *SSE Dean's Travel Fund Award, Tulane University*   *Spring 2025*
  - *Office of International Students & Scholars Scholarship, Tulane University*   *Spring 2025*
  - *Department of Mathematics Travel Award, Tulane University*   *Fall 2024, Spring 2025*
  - *GSSA Travel Support, Tulane University*   *Fall 2023, Spring 2025, Summer 2025*
  - *Host University/NSF Funded Travel Supports*   *Spring 2022 onwards*
    - Southern Regional Algebra Conference (SRAC) 2022
    - Texas Algebraic Geometry Symposium (TAGS) 2022
    - Southwest Local Algebra Meeting (SLAM) 2023, 2024, 2025
    - MSRI/SLMath CMND Summer School 2023
    - Summer CAMP 2023, 2025
    - BrianFest 2023
    - UweFest 2024
    - KUMUNU 2024
    - Symmetries and Singularities in Texas 2025
    - Séminaire de Mathématiques Supérieures (SMS)

OUTREACH & COMMUNITY INVOLVEMENT

- **Academic Learning & Tutoring Center (ALTC), Tulane University**
  Math Department Teaching Assistant   *Fall 2023- Presesnt*
  - Facilitating problem-solving in both one-on-one and small group settings.
  - Assisting for Calculus I-III, Statistics, Linear Algebra, Real Analysis

- **K-12 STEM Outreach Program**
  Math Section Leader: GiST (Girls in STEM at Tulane)   *October 2022, April 2023*
  Math Section Leader: BATS (Boys At Tulane in STEM)   *April 2024, September 2024*
  - Welcoming 5th to 7th grade students for hands-on experience in STEM Fields.
  - Conducted different Math Models to learn advanced topics via stimulating activities.

- **American Mathematical Society (AMS) Tulane Student Chapter**
  Treasurer   *May 2022 – May 2023*
  President   *June 2023 – June 2024*
    - Organizer of AMS/AWM Faculty Talks, Tulane University.
    - Organized Annual Math BBQ, 2023 & 2024.
    - Compilation of Alumni Data in the Graduate Student Chapter Website.

- **South Asian Graduate Association (SAGA), Tulane University**
  Vice President   *June 2022 – May 2023*
    - Restarted the dormant association after CoVID-19.

- **Training and Placement Cell, Tezpur University**
  Departmental Coordinator   *August 2019 – July 2020*
  Secretary of Alumni Association   *July 2023 - Present*
    - Managing Academic & Job Allocation Database.
    - Organizer of 1st Math Alumni Meet, Tezpur University.

- **Students Science Council, Tezpur University**
  Departmental Representative   *October 2018 – December 2019*
    - Volunteered in Several Outreach Programs of $InSCIgnis$, 2019.

- **Department of Mathematical Science, Tezpur University**
  Departmental Coordinator   *October 2018 – December 2019*
  Volunteer   *January 2020 - July 2020*
    - Organized Math Events in $InSCIgnis$, 2019 and π-Day, 2019 & 2020 (Online).
    - Organized and Supervised Math Events and Quizzes in 2nd Assam Science Festival held at Tezpur.
    - Organized National Mathematics Day, the birthday of Srinivasa Ramanujan (Online).

MEMBERSHIPS

- American Mathematical Society (AMS)   2021 onwards
- Society for Industrial and Applied Mathematics (SIAM)   2021 onwards
- Mathematical Association of America (MAA)   2022 onwards

ATTENDED CONFERENCES, WORKSHOPS & SEMINARS/WEBINARS (SELECTED)

- **Mathematical Congress of the Americas (MCA) 2025**   July 2025
  InterContinental Miami, an IHG Hotel   *Miami, Florida, United States*
- **Séminaire de Mathématiques Supérieures (SMS) 2025**   June 2025
  Fields Institute, Univeristy of Toronto   *Toronto, Ontario, Canada*
- **AMS Sectional Meeting: 2025 Spring Western Sectional Meeting**   May 2025
  California Polytechnic State Univeristy   *San Luis Obispo, California, United States*
- **Macaulay2 Workshop**   April 2025
  Tulane University   *New Orleans, Louisiana, United States*
- **Tulane Research, Innovation and Creativity Summit (TRICS) 2025**   April 2025
  Tulane University   *New Orleans, Louisiana, United States*
- **Commutative Algebra in The South (CATS) 2025**   April 2025
  Georgia State University   *Atlanta, Georgia, United States*

- **Math For All in NOLA 2025 (Virtual Session)** — April 2025
  Tulane University — *[Hybrid] New Orleans, Louisiana, United States*
- **AMS Sectional Meeting: 2025 Spring Central Sectional Meeting** — March 2025
  University of Kansas — *Lawrence, Kansas, United States*
- **Southwest Local Algebra Meeting (SLAM) 2025** — February 2025
  Arizona State University — *Phoenix, Arizona, United States*
- **Symmetries and Singularities in Texas** — January 2025
  Texas A&M University — *College Station, Texas, USA*
- **Two-Day Conference on "Mathematical Sciences and Applications"** — January 2025
  Tezpur University — *[Hybrid] Tezpur, Assam, India*
- **KUMUNU** — August 2024
  University of Missouri — *Columbus, Missouri, USA*
- **UWE Fest 2024 (On the Occasion of Uwe Nagel's 60th Birthday)** — August 2024
  University of Notre Dame — *South Bend, Indiana, USA*
- **NCMW- Recent Trends in Commutative Algebra (2024)** — June 2024
  Indian Institute of Technology, Bombay — *Mumbai, India*
- **International Conference on Local Rings and Singularities** — June 2024
  Indian Institute of Technology, Bombay — *Mumbai, India*
- **Southwest Local Algebra Meeting (SLAM) 2024** — February 2024
  University of Oklahoma — *Norman, Oklahoma, United States*
- **BrianFest - Celebrate the Accomplishments of Prof. Brian Harbourne** — August 2023
  University of Nebraska-Lincoln — *Lincoln, Nebraska, USA*
- **MSRI/SLMath CMND Summer School** — May -June 2023
  University of Notre Dame — *South Bend, Indiana, USA*
- **Commutative Algebra in The South (CATS) 2023** — April 2023
  University of Alabama — *Tuscaloosa, Alabama, USA*
- **Southern Regional Algebra Conference (SRAC) 2023** — March 2023
  Tulane University — *New Orleans, Louisiana, USA*
- **Canadian Western Algebraic Geometry Symposium (CaWAGS)** — March 2023
  Simon Fraser University — *Burnaby, British Columbia, Canada*
- **Southwest Local Algebra Meeting (SLAM) 2023** — March 2023
  University of North Texas — *Denton, Texas, USA*
- **Southern Regional Algebra Conference (SRAC) 2022** — March 2022
  Georgia College & State University — *Milledgeville, Georgia, USA*
- **Combinatorial Algebra meets Algebraic Combinatorics (CAAC- 20th)** — January 2022
  The Fields Institute — *Virtual*
- **Combinatorial Algebra meets Algebraic Combinatorics (CAAC- 19th)** — January 2021
  Université du Québec à Montréal — *Virtual*
- **Advanced Instructional School on Commutative Algebra** — January 2021
  IIT Gandhinagar & IISC Bangalore with Advanced Training Schools — *Virtual*