

Curriculum Vitae

Dr. Arpan Mukherjee

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Personal Information

Date of Birth: 06.04.1994

Nationality: Indian

Gender: Male

Marital Status: Married with 1 kid

Academic Visits & Academic Positions

- Sept 2024 – Present  **MSU-BIT SMBU Joint Research Center of Applied Mathematics, Shenzhen MSU-BIT University, China (jointly by Moscow State University (MSU), Russia & Beijing Institute of Technology (BIT), China).**
• *Lecturer (Tenure-Track Assistant Professor)*
Mentor: Prof. Dr. Hongyu Liu, Chair Professor, City University of Hong-Kong, Hong-Kong SAR.
- Aug 2020 – July 2024  **Johann Radon Institute (RICAM), Austrian Academy of Sciences (ÖAW), Austria.**
• *Post-Doc. Research Scientist (Dec 2023-July 2024)*
Project [FWF-P32660]: Electromagnetism with Extreme Materials: Modeling, Analysis and Applications.
• *Doc. Research Scientist (Aug 2020-Nov 2023)*
Project [FWF-P32660/36942] : Electromagnetism with Extreme Materials: Modeling, Analysis and Applications / Resolvent Analysis of Sub-wavelength Resonators.
Project Leader: Univ.-Doz. Dr. Mourad Sini
- Sep 2019 – Mar 2020  **Department of Mathematics & Steinbuch Center for Computing (SCC), Karlsruhe Institute of Technology (KIT), Germany.**
• *Researcher*

Research Interest

1. Analysis of Partial Differential Equations.
2. Mathematical Physics
3. Engineering Mathematics
3. Mathematical Materials Science.
4. Wave Propagation
5. Uncertainty Quantification.

Scientific Works & Publications

Journal Articles

- 1 A. Mukherjee and M. Sini, “Heat Generation Using Lorentzian Nanoparticles: Estimation via Time-Domain Techniques,” *SIAM Journal on Multiscale Modeling and Simulation*, vol. 21, no. 2, pp. 542–597, 2023.
- 2 A. Mukherjee and M. Sini, “Acoustic Cavitation using Resonating Micro-Bubbles. Analysis in the Time-Domain,” *SIAM Journal on Mathematical Analysis*, vol. 55, no. 5, pp. 5575–5616, 2023.
- 3 A. Mukherjee and M. Sini, “Heat Generation Using Lorentzian Nanoparticles. The Full Maxwell System,” *SIAM Journal on Applied Mathematics*, vol. 84, no. 1, pp. 285–315, 2024.
- 4 A. Mukherjee and M. Sini, “Time-Dependent Acoustic Waves Generated by Multiple Resonant Bubbles: Application to Acoustic Cavitation,” *Journal of Evolution Equations*, vol. 24, no. 90, 2024.
- 5 X. Cao, A. Mukherjee, and M. Sini, “Effective Medium Theory for Heat Generation Using Plasmonics: A Parabolic Transmission Problem Driven by the Maxwell System,” *Mathematische Annalen*, 2025.

- 6** A. Mukherjee and M. Sini, "Dispersive Effective Model in the Time-Domain for Acoustic Waves Propagating in Bubbly Media," *SIAM Journal on Applied Mathematics*, vol. 85, no. 6, pp. 2508–2542, 2025.
- 7** A. Mukherjee and M. Sini, "Dispersive Effective Metasurface Model for Bubbly Media," *Journal of Differential Equations (Accepted)*, 2025.

Education

- Oct 2021–Nov 2023
- Doctor of Philosophy (Ph.D), Johannes Kepler University Linz, Austria.**
Industrial Mathematics.
Thesis Title: *Mathematical Analysis of Therapy Modalities using Heat Generation or Acoustic Cavitation.*
Supervisors: [Univ.-Doz. Dr. Mourad Sini](#) and [Prof. Dr. Haibing Wang](#).
Marks/ Grades: 1 (**Excellent**)
PhD Courses: Inverse Problems, Mathematical Methods in Electrodynamics, Integral Equation & Boundary Value Problems, Pseudo-differential operators and Fourier integral operators, etc.
- Aug 2018 – May 2020
- Master of Technology (M.Tech), IIT Madras, India & KIT, Germany.**
Industrial Mathematics and Scientific Computing.
Thesis title: *Approximate-Newton Approach for the Intrusive Polynomial Moment Method.*
Supervisors: [Prof. Dr. Sundar S](#) and [Prof. Dr. Martin Frank](#).
Marks/ Grades: 8.91/10
Courses: Mathematical Modelling in Industry, Applied Statistic in R, Numerical PDE, Computer Modelling, Applied Linear Algebra, Numerical Optimization, Data Structure and Algorithm, etc.
- Aug 2015 – May 2017
- Master of Science (M.Sc), Pondicherry University - A Central University, India.**
Mathematics.
Marks/ Grades: 9.83/10
Courses: Mathematical & Functional Analysis, Measure Theory and Integration, Linear Algebra, Advance Algebra, Advance Topology, Ordinary & Partial Differential Equation, etc.
- July 2011 – July 2015
- Bachelor of Science (B.Sc), Vivekananda Mahavidyalaya, The University of Burdwan, India.**
Mathematics.
Marks/ Grades: 7.2/10
Courses: Differential Equation, Group and Field Theory, Number Theory, 2D and 3D Geometry, Theory of Dynamics, Theory of Metric Space, Linear Programming Problem, etc.

Teaching Experience

- Instructor (Summer 2025)
- 1. Introduction to Mathematical Theory of Electromagnetism
- Instructor (Winter 2025)
- 1. Probability Theory and Mathematical Statistics
 - 2. Linear Algebra
 - 3. Mathematics for Biological Sciences
(Calculus, Linear Algebra & Discrete Mathematics)

Student Supervision

- Under-graduate
- 1. Mei Jia, Thesis Title: Introduction to Scattering Theory: Uniqueness Results and Expansion Theorems for Solutions of the Helmholtz Equation

Miscellaneous Academic Success

Fellowships & Awards

- 2020 ■ Awarded Doctoral Fellowship based on the project FWF-P32660: "**Electromagnetism with Extreme Materials: Modeling, Analysis and Applications**", Austrian Science Fund (FWF), Austria.
- 2019-2020 ■ Awarded a Scholarship "Combined Study and Practice Stays for Engineers from Developing Countries (KOSPIE) with Indian IITs", Deutscher Akademischer Austauschdienst - **DAAD**, Germany.
- 2018-2019 ■ Awarded a **Fellowship Half Time Teaching Assistant (HTTA)**, IIT Madras & Ministry of Human Resource Development (MHRD), Chennai, India.
- 2018 ■ Awarded **DST-INSPIRE Fellowship (Junior Research Fellowship)**, Govt. of India, Ministry of Science and Technology, Dept. of Science and Technology (DST), India. (Not availed)
- 2016-2017 ■ Awarded a **Merit Scholarship for obtaining good academic performance in MSc**, Pondicherry University (A Central University), Pondicherry, India.
- 2011-2016 ■ Awarded a **Scholarship for Higher Education – Innovation in Science Pursuit for Inspired Research (INSPIRE)**, Govt. of India, Ministry of Science and Technology, Dept. of Science and Technology (DST), India.

Certification

- 2018 ■ Qualified in **Graduate Aptitude Test in Engineering (GATE)**, IITs and IISc, All India Rank (AIR) 469, GATE Score 464.
- 2015 ■ Qualified in **Joint Admission Test (JAM)**, IITs and IISc, India.

Research Activity

Presentations (Invited, conference or Seminar)

- 2025 ■ The 3rd HKSIAM Biennial Conference, July 7-11, 2025, The Chinese University of Hong Kong and Hong Kong Society for Industry and Applied Mathematics (HKSIAM), Hong-Kong SAR.
■ The 1st Sino-Belarusian Mathematics and Applied Mathematics Conference, April 3, 2025, Shenzhen MSU-BIT University, China.
■ The 2nd SMBU Sino-Russian Conference on Mathematics, March 22, 2025, Shenzhen MSU-BIT University, China.
- 2024 ■ 14th AIMS Conference, December 16 – 20, 2024, New York University Abu Dhabi and AIMS, Abu Dhabi, UAE.
■ CityU-SJTU Joint Workshop on Computational Mathematics, November 23 – 24, 2024, City University of Hong-Kong, Hong-Kong SAR.
■ 9th European Congress of Mathematics (ECM 2024), July 15 - 19, 2024, European Mathematical Society, Spain.
■ 8th International Conference on Applied Mathematics (ICAM 2024), May 28- June 1, 2024, City University of Hong-Kong, Hong-Kong SAR.
■ Department of Mathematics and Statistics Seminar, "Mathematical Analysis of Therapy Modalities using Acoustic Cavitation", January 18, 2024, IIT Tirupati, India.
- 2023 ■ 17th International Workshop on Optimization and Inverse Problems in Electromagnetism (OIPE 2023), September, 17 – 20, 2023. TU Graz, Austria.
■ 11th Applied Inverse Problems Conference 2023 (AIP 2023), September 4-8, 2023, University of Göttingen, Germany.
■ 3rd Alps-Adriatic Inverse Problems Workshop 2023 (AAIP 2023), July 5-7, 2023, Alpen Adria Universitaet Klagenfurt, Austria.
- 2022 ■ International Conference on Analysis, Inverse Problems, and Applications, July 18-21, 2022, IIT Madras, India. (Paper accepted for Presentation).
- 2019 ■ "Stability of miscible displacements in Porous Media: Rectilinear flow", 2019, IIT Madras, India.
- 2018 ■ "Comparative Study of Various Image Noise Reduction Techniques and A Small Survey on PSNR and MSE", 2018, IIT Madras, India.

Research Activity (continued)

- "A Small Survey about Traffic Flow Problem", 2018, IIT Madras, India.

Conference/Workshop Organizing

- 2025 ■ Co-organizer, Minisymposium: "Inverse Problems for Evolution Equations", 12th Applied Inverse Problem Conference (AIP2025), Rio de Janeiro, Brazil, July 28-August 1, 2025.

Conference Participation

- 2022 ■ Special Semester on Tomography Across the Scales, Oct 3 - Dec 2, 2022, RICAM, Austrian Academy of Sciences, Austria.
■ Austrian Numerical Analysis Day, May 4-6, 2022, RICAM, Austrian Academy of Sciences and JKU Linz, Austria.
- 2021 ■ Special Semester on Tomography Across the Scales, October 11-15, 2021, RICAM, Austrian Academy of Sciences, Austria.
- 2013 ■ MTTS (Mathematical Training and Talent Search) Program, IIT Bhubaneswar, School of Basic Sciences, funded by NBHM (National Board of Higher Mathematics), India.

Skills

- Languages ■ Strong reading, writing and speaking competencies for English, Hindi (National), Bengali (Native).
Coding ■ Python, Julia, Matlab, R
Misc. ■ LATEX typesetting and publishing.

References

Univ.-Doz. Dr. Mourad Sini

Senior Fellow

Inverse Problems and Mathematical Imaging
RICAM, Austrian Academy of Sciences
Altenbergerstrasse 69, 4040 Linz
Upper Austria, Austria.
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Prof. Dr. Martin Frank

Director and Professor

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Hermann-von-Helmholtz-Platz 1
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Prof. Dr. Hongyu Liu

Professor

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Prof. Dr. S. Sundar (Director, NIT Mizoram)

Chair Professor and DAAD Research Ambassador
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