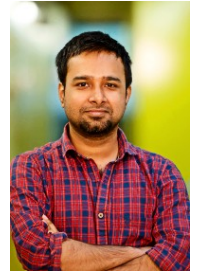


# Curriculum Vitae

## Dr. Arpan Mukherjee

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ORCID ResearchGate Google Scholar LinkedIn



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

## Teaching Experience







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|--------------------------|---|
| Instructor (Summer 2025) | ■ 1. Introduction to Mathematical Theory of Electromagnetism  |
| Instructor (Winter 2025) | ■ 1. Probability Theory and Mathematical Statistics<br>2. Linear Algebra<br>3. Mathematics for Biological Sciences<br>(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 |
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## 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 3<sup>rd</sup> 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 1<sup>st</sup> Sino-Belarusian Mathematics and Applied Mathematics Conference, April 3, 2025, Shenzhen MSU-BIT University, China.
-  The 2<sup>nd</sup> SMBU Sino-Russian Conference on Mathematics, March 22, 2025, Shenzhen MSU-BIT University, China.
- 2024      14<sup>th</sup> 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.
-  9<sup>th</sup> European Congress of Mathematics (ECM 2024), July 15 - 19, 2024, European Mathematical Society, Spain.
-  8<sup>th</sup> 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      17<sup>th</sup> International Workshop on Optimization and Inverse Problems in Electromagnetism (OIPE 2023), September, 17 – 20, 2023. TU Graz, Austria.
-  11<sup>th</sup> Applied Inverse Problems Conference 2023 (AIP 2023), September 4-8, 2023, University of Göttingen, Germany.
-  3<sup>rd</sup> 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", 12<sup>th</sup> 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

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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

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Steinbuch Centre for Computing  
Karlsruher Institut für Technologie (KIT)  
Hermann-von-Helmholtz-Platz 1  
76344 Eggenstein-Leopoldshafen, Germany  
[martin.frank@kit.edu](mailto:martin.frank@kit.edu)

### Prof. Dr. Hongyu Liu

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City University of Hong Kong, Kowloon,  
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[hongyu.liuip@gmail.com](mailto:hongyu.liuip@gmail.com); [hongyliu@cityu.edu.hk](mailto:hongyliu@cityu.edu.hk)

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

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