Partha Sarathi Banerjee

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Profile

I am a quantitative researcher, pursuing a PhD in Theoretical Physics and worked at Morgan Stanley in the Validation sphere of Model Risk Management (MRM). I have experience in multiple subdisciplines in model risk, including Risk and Capital Models and Non-Financial Risk. Skilled in developing mathematical models and analyzing financial risk data using a rigorous quantitative approach.

Education

2019 – present
Ph.D. Physics
Indian Institute of Technology Delhi, India
Specialization: Quantum Condensed Matter Physics
Thesis title: *Scattering of Massless Dirac Fermions in Modulated Graphene Structures of Different Dimensionality and Its Effect on Electron Transport*

2017 – 2019
M.Sc. Physics
Indian Institute of Technology Delhi, India
Thesis title: *Parametric resonance in presence of noise and dissipation memory kernel.*
CGPA Obtained: 8.512

2014 – 2017
B.Sc. Hons. in Physics
Bangabasi College, University of Calcutta, India

Experience

Jan 2025 – July 2025
Internship at **Morgan Stanley**
Worked on Tier 1 Risk and Capitals models related to RWA and Prudent Valuation. Performed model diagnostic tests, benchmark tests and sensitivity analysis

Worked on the initial validation of AI/ML based identity verification models.

Skills

Programming Languages
Python 3+ (Numpy, Pandas, SciPy, Matplotlib, Seaborn), FORTRAN, C, R, Julia
Over 8 years of experience implementing mathematical models in code. Performed large scale simulations on High performance computing (HPC) environment.

Risk
Value at Risk (VaR), Stressed VaR, Risk Not in VaR (RNIV), RWA calculation with FRTB regulations, Prudent Valuation.

Data Science
Linear regression, Polynomial regression, Ridge regression, Lasso regression, Elastic Net, PCA regression.

Tools
LaTeX typesetting, Mathematica, MATLAB, MS Excel.

Operating Systems
Linux, Windows

Other Technical Skills
Statistical Analysis and Research Methodologies

Language
English - proficient, Bengali - Native, Hindi - proficient

Awards and Achievements

2019 Qualified **JEST** and **GATE** for PhD.

2018 Qualified **Joint CSIR-UGC NET(LS).**

Qualified **JEST** for PhD (Rank 125).

2017 **State Topper (West Bengal)** of National Graduate Physics Examination of IAPT.

College Topper in BSc(Hons.) Examination at Bangabasi College, Kolkata, India.

Qualified **JEST** for Integrated PhD (Rank 210).

Qualified **IIT-JAM** for M.Sc (Rank 109).

Project / Internship

July, 2018 - July, 2019 **MSc Project:** "Studying Parametric Resonance in the presence of Noise and Dissipation Memory Kernel" under the supervision of Dr Rahul Suresh Marathe at **Indian Institute of Technology, Delhi**, India.

May 2018 - July 2018 **Summer Research Internship:** "Aubry Transition in Colloidal Monolayers" under supervision of Dr. A. V. Anil Kumar at the National Institute of Science Education and Research **(NISER)**, Bhubaneshwar, India

Research Publications

1. P. S. Banerjee, R. Marathe, and S. Ghosh, "Electronic analogue of fourier optics with massless dirac fermions scattered by quantum dot lattice," *Journal of Optics*, vol. 26, no. 9, p. 095 602, Jul. 2024. DOI: 10.1088/2040-8986/ad645b.
2. P. S. Banerjee, R. Marathe, and S. Ghosh, "Magnetically modulated superconductor-graphene-superconductor (sgs) josephson junctions and their tunability," *Phys. Scr.*, vol. 100, no. 1, p. 015 965, Dec. 2024. DOI: 10.1088/1402-4896/ad9c23.

Teaching Assistantship at IIT Delhi

Courses: Numerical and Computational Methods in Research, Statistical Physics, Quantum Mechanics

Conferences Attended

Quantum Materials in the Quantum Information Era from 25 - 29 September 2023 at the Max Planck Institute for the Physics of Complex Systems (**MPIPKS**), Dresden, Germany.

Emergent phenomena in van der Waals heterostructures 2023 from 9-12 Jan 2023 at **TIFR**, Mumbai, India.

References

Prof Rahul Marathe
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Prof Sankalpa Ghosh
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