

ARIJIT SAHA

Professor (H)
Institute of Physics, Bhubaneswar



Selected Publications:

- “Current switching behavior mediated via hinge modes in higher order topological phase using altermagnets” Minakshi Subhadarshini, Amartya Pal, and Arijit Saha **Phys. Rev. B** **113**, 195421 (2026).
- “Josephson current signature of Floquet Majorana and topological accidental zero modes in altermagnet heterostructures” Amartya Pal, Debashish Mondal, Tanay Nag, and Arijit Saha **Phys. Rev. B (Letter)** **112**, L201408 (2025).
- “Topological Majorana zero modes and the superconducting diode effect driven by Fulde-Ferrell-Larkin-Ovchinnikov pairing in a helical Shiba chain” Sayak Bhowmik, and Arijit Saha **Phys. Rev. B (Letter)** **111**, L161402 (2025).
- “Distinguishing between topological Majorana and trivial zero modes via transport and shot noise study in an altermagnet heterostructure” Debashish Mondal, Amartya Pal, Arijit Saha, and Tanay Nag, **Phys. Rev. B (Letter)** **111**, L121401 (2025).
- “Optimizing one dimensional superconducting diodes: Interplay of Rashba spin-orbit coupling and magnetic fields” Sayak Bhowmik, Dibyendu Samanta, Ashis K. Nandy, Arijit Saha, and Sudeep Kumar Ghosh, **Communication Physics** **8**, 260 (2025).
- “Second-order topological superconductor via noncollinear magnetic texture” Pritam Chatterjee, Arnob Kumar Ghosh, Ashis K. Nandy and Arijit Saha, **Phys. Rev. B (Letter)** **109**, L041409 (2024)
- “Topological Superconductivity by Engineering Noncollinear Magnetism in Magnet/Superconductor Heterostructures: A Realistic Prescription for 2D Kitaev Model” Pritam Chatterjee, Sayan Banik, Sandip Bera, Arnob Kumar Ghosh, Saurabh Pradhan, Arijit Saha, and Ashis K. Nandy **Phys. Rev. B (Letter)** **109**, L121301 (2024).
- “Engineering anomalous Floquet Majorana modes and their time evolution in helical Shiba chain” Debashish Mondal, Arnob Kumar Ghosh, Tanay Nag and Arijit Saha, **Phys. Rev. B (Letter)** **108**, L081403 (2023).
- “Dynamical construction of Quadrupolar and Octupolar topological superconductors” Arnob Kumar Ghosh, Tanay Nag and Arijit Saha, **Phys. Rev. B** **105**, 155406 (2022).
- “Floquet generation of Second Order Topological Superconductor” Arnob Kumar Ghosh, Tanay Nag and Arijit Saha, **Phys. Rev. B** **103**, 045424 (2021).
- “Tailoring Metal Insulator Transitions & Band Topology via Off-resonant Periodic Drive in an Interacting Triangular Lattice”, Sayan Jana, Priyanka Mohan, Arijit Saha and Anamitra Mukherjee, **Phys. Rev. B** **101**, 115428 (2020).
- “Geometric Quantum Noise of Spin”, Alexander Shnirman, Yuval Gefen, Arijit Saha, Igor S. Burmistrov, Mikhail N. Kiselev, Alexander Altland, **Phys. Rev. Lett.** **114**, 176806 (2015).
- “Transport signature of fractional Fermions in Rashba nanowires”, Diego Rainis, Arijit Saha, Jelena Klinovaja, Luka Trifunovic, Daniel Loss, **Phys. Rev. Lett.** **112**, 196803 (2014).

Group:

Ph.D. Scholars



Kamalesh Bera

Thesis area: Twisted bi-layer/multi-layer systems



Sayak Bhowmik

Thesis area: Superconducting diode effect and topological Superconductivity



Minakshi Subhadarshini

Thesis area: Higher-order topological superconductivity and braiding of Majorana modes



Ohidul Alam

Thesis area: Altermagnets, Skyrmions and Superconducting proximity effect



Jagan Sahoo

Thesis area: Band topology and unconventional magnetism in quasi-crystals

Postdoctoral Fellows



Koushik R. Das

Research Area: Unconventional magnetism, Topological Superconductivity

Former members:

Ph.D. Scholars



Dr. Amartya Pal: Ph.D. (January 2022 - August 2026)

Thesis title: Transport signatures of Bogoliubov Fermi surfaces, Majorana modes and Diode effect in heterostructures of various superconductors and unconventional magnets

Current Affiliation: Postdoctoral Fellow, University of Stuttgart, Germany



Dr. Debashish Mondal: Ph.D. (August 2019 - August 2025)

Thesis title: Generation of static and Floquet Majorana modes and their transport signatures in Rashba nanowire, Shiba chain and altermagnetic hybrid setup

Current Affiliation: Postdoctoral Fellow, Saarland University, Germany



Dr. Pritam Chatterjee: Ph.D. (August 2018 - August 2024)

Thesis title: Topological Superconductivity in Magnet/Superconductor Heterostructures

Current Affiliation: Postdoctoral Fellow, Hefei National Laboratory, USTC, China



Dr. Arnob Kumar Ghosh: Ph.D. (August 2018 - August 2023)

Thesis title: Floquet generation of higher-order topological systems

Current Affiliation: Postdoctoral Fellow, Uppsala University, Sweden



Dr. Sayan Jana: Ph.D. (August 2016 - March 2022)

Thesis title: Zero-energy modes and strong correlation effects in topological systems

Current Affiliation: Postdoctoral Fellow, Tel Aviv University, Israel



Dr. Ganesh Ch Paul: Ph.D. (August 2014 - June 2020)

Thesis title: Transport and magnetic exchange properties of spin-orbit coupled, anisotropic Dirac materials and Majorana nanowires

Current Affiliation: Postdoctoral Fellow, TU Braunschweig, Germany

Postdoctoral Fellows



Prof. Paramita Dutta: (June 2015 - July 2018)

Current Affiliation: Associate Professor, Physical Research Laboratory, Ahmedabad, India



Prof. SK Firoz Islam: (July 2016 - October 2018)

Current Affiliation: Assistant Professor, Department of Physics, Jamia Millia Islamia (A Central University), New Delhi, India

Working area: Theoretical Condensed Matter Physics.

Areas of Interests:

- Quantum transport in low dimensional electronic systems.
- Dirac/Weyl Materials.
- Topological Insulators, Topological Superconductors and Majorana physics.
- Driven (out of equilibrium) topological systems.
- Proximity induced superconductivity in mesoscopic systems.
- Strongly correlated electronic systems and Luttinger liquid physics.
- Quantum pumping through nanostructures.
- Quantum computation.

Educational Qualification:

- **Ph.D. (August 2009):** Harish Chandra Research Institute, Allahabad, India.
- **MSc. (2003):** Visva-Bharati University, Santiniketan, India.
- **BSc. (2001):** Visva-Bharati University, Santiniketan, India.

Professional Experience:

- **1st July 2025 – Present:** Professor-H, Institute of Physics, Bhubaneswar, India.
- **1st July 2020 – 30th June 2025:** Associate Professor-G, Institute of Physics, Bhubaneswar, India.
- **5th May 2015 – 30th June 2020:** Reader-F, Institute of Physics, Bhubaneswar, India.
- **October 2012 – March 2015:** Postdoctoral Research Associate, University of Basel, Switzerland.
- **September 2009 – August 2012:** Postdoctoral Fellow, Weizmann Institute of Science, Israel.

Recognition/Fellowship:

Elected as a Member of National Academy of Sciences (NASI), India since 2019.