Dr. Purba Bhattacharya, *PhD (Science)*

Present Position: Assistant Professor Grade III
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Date of Birth: 20/02/1985

Education:

- Ph.D (Science) degree awarded by Calcutta University on the basis of the work carried out at SINP
- Post M.Sc. Associateship Course, Saha Institute of Nuclear Physics
- M.Sc. in Pure Physics, University of Calcutta

Research Key Areas:

- Nuclear and Particle Physics Experiment and Simulation
- Radiation Physics
- Detector Physics and Detector Development

Research Highlights:

- Imaging of Archaeological and Civil Structures using Atmospheric Muons (IACSAM): PI of Project funded by SCIENCE & ENGINEERING RESEARCH BOARD (SERB), 2022
- Detection of Fission Fragment by THGEM-based Detector: PI of Project funded by University Grant Commission and D.S.Kothari Post-Doctoral Fellowship Scheme in Collaboration with Variable Energy Cyclotron Centre, Kolkata and Saha Institute of Nuclear Physics, Kolkata,
- Development of an Active Target with Monolithic Pixel Sensors for Precision Measurements of Charm and Beauty: University of Cagliari in Italy in association with INFN, Italy
- DHCAL project carried out during Post Doc period at Weizmann Institute of Science, Israel in collaboration with LAPP, Annecey, France
- CEFIPRA project carried out during Ph.D. in collaboration with DSM/IRFU, CEA/Saclay, France

Experience:

- Assistant Professor in Department of Physics (School of Basic and Applied Sciences), Adamas University, India, 2021-Till Date
- D.S.Kothari Post Doc Fellow (Higher Fellowship), University Calcutta, India, 2020-2021
- Post Doc Fellow in INFN, Cagliari, Italy in Association with University of Cagliari, Italy, 2019-2020
- Post Doc Fellow in Weizmann Institute of Science, Israel, 2016-2019
- Post Doc Fellow in NISER, Bhubaneswar, India 2015-2016

Technical Expertise:

- Extensive experience in the development, fabrication and application of advanced particle detectors which are also very regularly used in healthcare and environmental applications
  - radiation dosimetry
  - micro- and nano-dosimetry relevant to medical and space applications,
  - PET scan,
  - medical imaging such as tomography
  - fire detection
- Setting up of detector laboratory and installation of the infrastructure needed for the above
  - Expertise in handling sophisticated instruments
  - power supplies, digital oscilloscopes, amplifiers, picoammeters, multi-channel analyzers
  - NI based DAQ, ASIC based DAQ
  - radiation sources, X-ray guns, UV lamps
  - computer interfaced optical microscopes
  - micron resolution 3D positioning systems
  - clean room protocols etc.
  - environment monitoring devices
- Accelerator-based test beam experience
- Extensive experience in detailed numerical simulation for the above-mentioned detectors using open-source software packages popular in nuclear and particle physics. Knowledge of relevant computer programing languages (C, C++)
- Expertise in Finite Element Method (FEM) simulation using COMSOL Multiphysics
- Knowledge of SRIM, Geant4, ROOT and Python

Research Publication (s)

- Number of research papers published in International refereed journals: 51
- Number of research papers published in international peer-reviewed Scopus Proceedings: 20
- Number of research papers published in national peer-reviewed Scopus Proceedings: 3
- Number of invited Book-Chapters: 03
- H-index: 22
- I-index: 33

For Details, Visit: https://scholar.google.com/citations?user=5bXOfcoAAAAJ&hl=en

Selected Publication (s):

1. T. Dey, **P. Bhattacharya**, S. Mukhopadhyay, N. Majumdar, A. Seal, S. Chattopadhyay, "Parallelization of Garfield++ and neBEM to simulate space-charge effects in RPCs", Computer Physics Communications, Vol 294, pp. 108944, 2024
2. A. Mulliri, M. Arba, **P. Bhattacharya**, E. Casula, C. Cicalo, A. De. Falco, M. Mager, D. Marras, A. Masoni, L. Musa, "Pixel chamber: a solid-state active-target for 3D imaging of charm and beauty", Journal of Instrumentation, Vol. 16, pp. C12029, 2021
3. P. Roy, **P. Bhattacharya**, P. K. Rout, S. Mukhopadhyay, N. Majumdar, S. Sarkar, "Effect of hole geometry on charge sharing and other parameters in GEM-based detectors", Journal of Instrumentation, Vol. 17, pp. P03016, 2022
4. **P. Bhattacharya**, A. Tesi, D. Shaked-Renous, L. Moleri, A. Breskin, S. Bressler, "Single-

electron spectra in RPWELL-based detectors", Journal of Instrumentation, Vol. 16, pp. P05004, 2021

5. P. Roy, **P. Bhattacharya**, S. Mukhopadhyay, N. Majumdar, "Charge sharing in single and double GEMs", Journal of Instrumentation, Vol. 16, pp. P05001, 2021
6. D. S. Bhattacharya, **P. Bhattacharya**, S. Mukhopadhyay, N. Majumdar, S. Sarkar, S. Bhattacharya, P. Colas, D. Attie, S. Ganjour, A. Bhattacharya, "Numerical study of track distortion in the Large Prototype TPC with end-plate based on bulk Micromegas", Journal of Instrumentation, Vol. 15, pp. P07030, 2020
7. **P. Bhattacharya**, L. Moleri, S. Bressler, "Signal formation in THGEM-like detectors", Nuclear Instruments and Methods in Physics Research A, Vol. 916, pp. 125, 2019
8. L. Moleri, **P. Bhattacharya**, A. E. C. Coimbra, A. Breskin, S. Bressler, "On the localization properties of an RPWELL gas-avalanche detectors", Journal of Instrumentation, Vol. 12, pp. P10017, 2017
9. **P. Bhattacharya**, B. Mohanty, S. Mukhopadhyay, N. Majumdar, H. Natal da Luz, "3D simulation of electron and ion transmission of GEM-based detectors", Nuclear Instruments and Methods in Physics Research A, Vol. 870, pp. 64, 2017
10. **P. Bhattacharya**, D. S. Bhattacharya, S. Mukhopadhyay, S. Bhattacharya, N. Majumdar, S. Sarkar, P. Colas, D. Attie, "Investigation of ion backflow in bulk Micromegas detectors, Journal of Instrumentation, Vol. 10, pp. P09017, 2015
11. **P. Bhattacharya**, S. Mukhopadhyay, N. Majumdar, S. Bhattacharya, "The effect of spacer on the performance of bulk Micromegas: a numerical investigation", Nuclear Instruments and Methods in Physics Research A, Vol. 793, pp. 41, 2015
12. **P. Bhattacharya**, S. Bhattacharya, N. Majumdar, S. Mukhopadhyay, S. Sarkar, P. Colas, D. Attie, "Comparison of bulk Micromegas with different amplification gap", Nuclear Instruments and Methods in Physics Research A, Vol. 732, pp. 208, 2013
13. K. Nikolopoulos, **P. Bhattacharya**, V. Chernyatin, R. Veenhof, "Electron Transparency of a Micromegas mesh", Journal of Instrumentation, Vol. 6, pp. P06011, 2011

Research Projects: (till date)

1. "Imaging of Archaeological and Civil Structures using Atmospheric Muons (IACSAM)", INR 30 Lakh, Funded by SCIENCE & ENGINEERING RESEARCH BOARD (SERB), 2022.
2. "Detection of Fission Fragment by THGEM-based Detector", INR 3 Lakh, Funded by University of Grant Commission and D. S. Kothari Post-Doctoral Scheme, 2020-21
3. "Development of An Active Target with Monolithic Pixel Sensors for Precision Measurements of Charm and Beauty", Funded by University of Cagliari and INFN, Italy, 2019-20.
4. "Novel Resistive Plate Sampling Element for (S)DHCAL", Funded by Weizmann Institute of Science, Israel and LAPP, Annecey, France, 2016 -2019.
5. "Research and Development of Micromegas Detector and Related Devices", CEFIPRA Project, Funded by Indo-French Centre for the Promotion of Advanced Research, 2012-2014.

Award/ Academic Recognition/ Major Professional Activity:

- SERB SRG Research Grant
- D.S. Kothari Post-Doctoral Higher Fellowship Award
- Reviewer for Journals: Nuclear Instruments and Methods in Physics Research A (Elsevier), Reviewer for Journals: Simulation (SAGE Journals), Reviewer for Journals: Measurements (Elsevier), Journal of Instruments (IOP)

- Best Oral Presentation in 8th SERC School on EHEP, VECC, India
- Best Poster Award in 8th International Conference on women in Physics (ICWIP 2023) organized by TIFR, India
- RSO Certification Course for Research, Radiotracer and Column Scanning Application of Ionizing Radiation organized by Bhabha Atomic Research Centre in association with Amity University, Noida (1st Prize)

Dissertation / Project / Ph.D. Guidance: (till date):

- Technical Advisor of 1 student from Saha Institute of Nuclear Physics, India
- Guide of Project Associate-1 under SERB SRG scheme
- UG Dissertation: 4
- PG Dissertation: 2
- Doctoral Committee Member: 2 students
- Ph.D Guide: 2

Collaborations:

- **International**
  - Member of the RD51 Collaboration, CERN, Switzerland
  - EIC India Collaboration
  - DSM/IRFU, CEA/Saclay, France
  - Worked in a project for CMS-GEM Collaboration
  - Worked as a guest for ALICE TPC-GEM Upgrade Collaboration
  - Weizmann Institute of Science, Israel
  - LAPP, Annecey, France
  - Technion University, Israel
  - Instituto de Fisica, Universidade de Sao Paulo, Brazil
  - INFN, Cagliari, Italy
  - University of Cagliari, Italy

- **National**
  - NISER, Bhubaneswar, India
  - IOP, Bhubaneswar, India
  - Saha Institute of Nuclear Physics, India
  - VECC, Kolkata, India

Outreach Program:

- Demonstrator of Time Projection Chamber in the Outreach Program "Exploring radiation in many splendours" at SINP, Kolkata
- Local Student Organizer of the lecture series on Micro Pattern Gas Detectors, at SINP, Kolkata, India
- Local Organizer of the 3rd NATIONAL CONFERENCE ON FRONTIERS IN MODERN PHYSICS (NCFMP 2021)
- Convenor of Global Summit on Sustainable Science and Technology (GS^3T 2022)
- Convenor of 4th NATIONAL CONFERENCE ON FRONTIERS IN MODERN PHYSICS (NCFMP 2024)
- Resource Person of ICFA 2023 school organized by TIFR
