Dr. Rajendra Prasad Giri

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EDUCATION

- PhD. Saha Institute of Nuclear Physics, Kolkata, India 2012-2017
- Post MSc. Saha Institute of Nuclear Physics, Kolkata, India 2011-2012
- MSc. Physics (1st class) Indian Institute of Technology Kharagpur, India 2009-2011
- BSc. Physics (1st class) RKMRC Narendrapur (Calcutta University), India 2006-2009

RESEARCH EXPERIENCE

Assistant Professor 2023-Present
Department of Physics, Indian Institute of Technology (ISM) Dhanbad

Postdoctoral Researcher 2018-2023
Institute for Experimental and Applied Physics, Kiel University, Germany

Project: "Developments of an optical pump – X-ray probe setup at LISA P08 beamline and measurements from liquid surfaces and interfaces
Supervisor: Dr. Bridget M Murphy, Group: Magnussen/Murphy

Senior Research Fellow (doctoral) 2012-2017
Surface Physics and Material Science Division, Saha Institute of Nuclear Physics, India

Thesis title: "Investigation of protein-induced structural changes in model biomembranes"
Supervisor: Dr. Mrinmay K Mukhopadhyay

Junior Research Fellow (doctoral) 2011-2012
Surface Physics and Materials Science Division, Saha Institute of Nuclear Physics, India

Project: "Quantum spin liquids",
Supervisor: Dr. Arti Garg

Project fellow June - August'2011
Dept. of Physics & Meteorology, Indian Institute of Technology Kharagpur, India

Project: "Structural characterization of thin films and multilayers by X-ray scattering technique"
Supervisors: Prof. Samit Kumar Ray and Prof. Sanjeev K Srivastava

RESEARCH & DEVELOPMENT PROJECT (as PI)

- **KiNSIS Early Career Award Grant** 2022-2023
  (Funding source: Kiel Nano, Surface and Interface Science, Kiel University)
  - Amount: 5000 Euro (≈ 4,20,000 INR)
  - Duration & Status: 1 year, ongoing
  - Role: Principal Investigator
  - Project title: 'Graphene-mediated control of cholesterol level in model phospholipid
  - membranes: Understanding cholesterol extraction mechanisms and impacts of graphene on human health'
- **KiNSIS Project Grant** 2021-2022
  (Funding source: Kiel Nano, Surface and Interface Science, Kiel University)
  - Amount: 2000 Euro (≈ 1,76,000 INR)
  - Duration & Status: 1 year, completed
  - Role: Principal Investigator
  - Project title: 'Graphene-based nanomaterials in biomembranes: unfolding the molecular mechanisms of cytotoxicity and cholesterol metabolism'

PRESENTATION

Invited talk or Contributed oral (National/ international)

- **Department Seminar at Dept. of Physics, IIT (ISM) Dhanbad**, India: 'Understanding structure and dynamics of nano-bio interfaces and liquid surfaces by X-ray scattering', **May 2023** (Online)
- **Seminar at APS of Argonne National Laboratory** (USA): 'Understanding structure and dynamics of nano-bio interfaces and liquid surfaces by X-ray scattering', **April 2023**
- **Department Seminar at Dept. of Physics, IIT Guwahati**, India: 'Understanding structure and dynamics of nano-bio interfaces and liquid surfaces by X-ray scattering', **February 2023** (Online)
- **Department Seminar at Dept. of Physics, IIT Bombay**, India: 'Understanding structure and dynamics of nano-bio interfaces and liquid surfaces by X-ray scattering', **February 2023** (Online)
- **Department Seminar at Dept. of Physics & Astrophysics, Delhi University**, India: 'Physics of nano-bio interfaces and liquid surfaces', **February 2023** (Online)
- **Department Seminar at Dept. of Physics, NIT Rourkela**, India: 'Physics of nano-bio interfaces and liquid surfaces by X-ray scattering', **February 2023** (Online)
- **SNI 2022**, Free University, Berlin (Germany): 'Time-resolved measurements from liquid vapor interfaces using synchrotron based optical pump X ray probe technique', **September 2022**
- **KiNSIS Retreat 2022**, Sankelmark Academy, Germany: 'Physics of nanoparticle interaction with biomembranes impact on human health and environment', **August 2022**
- **Department Seminar at Dept. of Chemistry, Tsukuba University**, Japan (Invited by Prof. Mafumi Hishida): 'Interaction and self-assembly of foreign molecules and nanoparticles with model biomembrane', **July 2022**
- ***Synchrotron Radiation Instrumentation*** *(Online), Hamburg, Germany*: 'Development of an optical pump – X-ray probe facility for the time-resolved measurements from liquid-vapour interfaces', **March 2022**
- ***DESY Users' Meeting*** *(Online), Hamburg, Germany:* 'Lipid-induced self-assembly of graphene oxide nanoflakes at the air−water interface', **January 2022**
- ***Young Multis 2021****, Krakow, Poland (Online)*: Time-resolved measurements from liquid-vapour interfaces using optical pump - X-ray probe technique, **July 2021**
- ***Departmental Seminar at Physics Department****, Shiv Nadar University, UP, India*: Synchrotron X-ray scattering and optical pump – X-ray probe measurements from liquid surfaces and interfaces, **March 2019**

- ***12th North German Biophysics Meeting**, Borstel, Germany*: 'Concentration and surface packing-specific interaction of planar molecules with lipid membranes', **January 2019**
- ***Saha Memorial Colloquium**, Saha Institute of Nuclear Physics, Kolkata, India*: Physics of interaction between biomembrane and guest molecules from structural perspective, **October 2017**
- ***Group Seminar at Prof. Kenji Sakurai's group, National Institute of Material Science**, Tsukuba, Japan:* 'Investigation of lipid-protein interaction by X-ray scattering methods', **February 2017**

Poster (International, Selected)

- ***DESY Users' Meeting** (Online), Hamburg, Germany: '*Time response studies of liquid-vapor interfaces using optical pump - X-ray probe technique', January 2022
- **Surface X-ray and Neutron Scattering** (Online), Lund, Sweden: 'Time response studies of liquid surfaces and interfaces using optical pump - X-ray probe method', **January 2022**
- ***DESY Users' Meeting** (Online), Hamburg, Germany: '*Optical pump - X-ray probe studies from liquid-vapour interfaces', **January 2021**
- ***12th North German Biophysics Meeting**, Borstel, Germany*: 'Optical pump – X-ray probe measurements from liquid surfaces and interfaces', **January 2019**
- ***DESY Users' Meeting**, Hamburg, Germany: '*Optical pump - X-ray probe measurements from liquid surfaces and interfaces', **January 2019**
- ***German Conference for Research with Synchrotron radiation, Neutrons and Ion Beams at Large Facilities**, Technical University Munich, Germany*: 'Investigation of structure and dynamics of liquid surfaces by optical pump – X-ray probe measurements', **September 2018**
- ***Surface X-ray and Neutron Scattering**, Pohang Accelerator Laboratory, Korea*: 'Investigation of structure and dynamics of surfaces and interfaces by X-ray scattering and optical pump – X-ray probe measurements', **July 2018**
- ***DESY Users' Meeting**, Hamburg, Germany: '*Continuous uptake or saturation: A concentration and surface packing-specific hemin interaction with phospholipid membranes', **January 2018**
- ***14th International Fischer Symposium**, Kloster Seeon, Germany*: 'Structure and dynamical aspects of hemin interaction with phospholipid model membranes', **May 2018**
- ***Advances in Nanomaterials using Synchrotron Techniques**, Saha Institute of Nuclear Physics, India*: 'X-ray reflectivity study of lipid-biomolecule interaction', **December 2014**
- ***International Union of materials Research Society – ICA 2013**, Indian Institute of Science, India*: 'Structural Study of Polymer-supported Lipid Membranes', **December 2013**
- ***International School on Nanoscience with X-ray and Neutron Sources**, Saha Institute of Nuclear Physics, India*: (Participation only) **July 2012**
- ***Surface X-ray and Neutron Scattering**, Hyatt Regency, India*: (Participation only) **July 2012**

Poster (National, Selected)

- ***Young scientist's Colloquium 2016**, S N Bose National Center for Basic Sciences, Kolkata, India:* Protein-induced structural modulation in phospholipid membranes: An X-ray scattering study, **September 2016**
- ***DAE Solid State Physics Symposium**, Amity University, UP, India*: Self-assembly of di-block co-polymers at air-water interface, **December 2015**

EDITORIAL EXPERIENCE

- Served as a reviewer for **Biophysical Journal** (Elsevier), **Small** (Wiley-VCH), **J. Phys. B: At. Mol. Opt. Phys.** (IOP), **Adv. Colloid Interface Sci.** (Elsevier)
- Currently serving as a Volunteer Reviewer at MDPI journals: **Biomimetics**, **Physchem**, and **Biophysica**

TECHNICAL EXPERIENCE

- Synchrotron-based developments
    - Optical (laser) pump – X-ray probe setup at LISA P08 (PETRA III, DESY, Germany) for ultrafast non-equilibrium dynamics measurements from liquid surfaces and interfaces
    - Liquid surface X-ray diffractometer at the Indian Beamline at Photon Factory, KEK, Japan
    - Grazing incidence diffraction (GID) and grazing incidence small angle X-ray scattering (GISAXS) setup in the LISA P08 beamline at PETRA-III (DESY, Germany)
- Lab-based instruments handled/managed
    - Langmuir-Blodgett trough (KSV NIMA) integrated with Brewster's Angle Microscopy
    - X-ray diffractometer (Bruker Corp. & Rigaku SmartLab),
    - Atomic Force Microscopy (Agilent Technologies)
    - Ellipsometry
- Work experience as synchrotron beamline scientist
    - At the Indian Beamline at Photon Factory, KEK, Japan from 2015-2017
    - At LISA P08 for X-ray reflectivity, GID and GISAXS from air-water interfaces in Langmuir trough and liquid-liquid interfaces
    - At LISA P08 for pump-probe measurements from liquid-vapor interfaces (liquid Hg, water, water-based halide salt solutions)
- X-ray and neutron beamlines visited
    - Indian Beamline BL-18B at PF, KEK, Japan
    - LISA P08 at PETRA III, DESY, Germany
    - ID 10 at ESRF, France
    - BL-2 and BL-9 at DELTA, Dortmund, Germany
    - KMC-3 at BESSY II, HZB Berlin, Germany
    - Neutron beamline BL-16 at J-PARC, Japan
- Programming languages
    - Python, MATLAB, C, Fortran

TEACHING EXPERIENCE

- **PHE202** – Materials Science and Engineering, Summer semester 2024-2025 at IIT (ISM) Dhanbad
- **PHO502** – Introduction to Biophysics, winter semester 2023-2024 at IIT (ISM) Dhanbad
- **Co-supervised Bachelor's thesis** of Ms. Katharina Steinkirchner, July – November 2023
- Gave **laboratory training to undergraduates and research fellows** as a part of my PhD supervisor's teaching duties on several experimental courses, mainly based on X-ray scattering techniques using laboratory X-ray sources and thin film deposition of soft materials and their characterization
- **Co-supervised Master's Research Practical** of Mr. Lukas Petersdorf and Mr. Nicolas Hayen, June – August 2022
- **Co-supervised Bachelor's thesis** of Mr. Zhi Yuan (Kiel University, Germany), October 2019 – January 2020

HONORS AND AWARDS

- 2022 – **Early Career Award** by Kiel Nano Surface and Interface Science, Kiel University
- 2018 – **Travel grants** for attending RACIRI Summer School 2018 in Rugen Island, Germany
- 2016 – **Best poster** award in "Young Scientist Colloquium 2016" at SNBNCBS, Kolkata, India
- 2016 – **GATE Physics** (All India Rank or AIR 431)
- 2013-2017 – **Travel grants** for visiting KEK (Japan) 9x, DESY (Germany) 2x, ANL (USA) 1x
- 2011 – **M-C-M Scholarship** from IIT Kharagpur
- 2011 – **Junior Research Fellowship** through NET (UGC, India) for pursuing PhD in physics (2011-2016)
- 2011 – **GATE Physics** (AIR 238)
- 2011 – **JEST Physics** (AIR 112)
- 2009 – **JAM Physics** 2009 (AIR 89)
- 2009 – **M-C-M scholarship** from the Govt. of West Bengal
- 2009 – **Prof. K. P. Memorial prize** from RKMR College Narendrapur (2nd highest in Physics Hons.)

ACADEMIC AND PROFESSIONAL ACHIEVEMENTS

- 2023 – Received offer from University of Chicago at Illinois (USA) as Research Assistant Professor
- 2017 – Received offer from Bihar PSC as Asst. Prof. of DSM College Jhajha under TM Bhagalpur University, Bihar
- 2009 – Stood 2nd (physics Hons.) in Physics Department of RKMRC Narendrapur (9th in University of Calcutta)