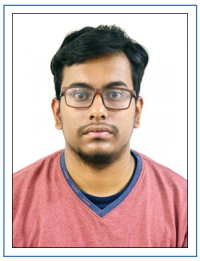
# Arka Prava Sarkar

*M.Sc Physics*

*Parvati Gardens, 357/1 Sarat Bose Lane*
*Kolkata 700081*
*India*
*+91 9007834039*
*sarkar.arkaprava200@gmail.com*
*DOB: 25th of July, 1994*



## Education

July 2019–Present **Junior Research Fellow**, ***Computational Materials Science***, **Indian Institute of Technology, Kharagpur, Coursework GPA : 8.30**.
Possible thesis on Computational studies of various properties of MXenes and its potential applications using Quantum and Classical Simulations.

2016–2018 **M.Sc Physics**, ***Indian Institute of Technology (ISM)***, **Dhanbad**, **OGPA–9.06**.
M.Sc Thesis on Computational Soft Condensed Matter Physics

2012–2016 **B.Sc Honours**, ***Asutosh College***, **Kolkata**, **Percentage–60.00%**.
Physics Honours, Mathematics and Computer Science

2011–2012 **XIIth Board**, ***Kendriya Vidyalaya Ordnance Factory***, **Dum Dum**, **Percentage – 87.00%**.
Maths, Physics, Chemistry and Computer Science

## Projects

Title ***Monte Carlo Simulations of Soft Sphere Potentials***

Supervisors **Dr. Pankaj Mishra, Associate Professor**

Description We have done a thorough study of the basic simulation techniques such as Monte Carlo and Molecular Dynamics Simulations. Then we applied the Classical NVT Monte Carlo Simulations in truncated 2.5 Lennard Jones Potential and studied it's properties using the radial distribution curve. Then we investigated the properties of one component plasma system (Coulomb like interactions) using a brief study of Nematic Liquid Crystal Phase and Classical NVT Monte Carlo Simulations for both 2D and 3D systems. The radial distribution curve was studied to investigate the properties of the system. This was a computational project work carried out at Indian Institute of Technology (ISM), Dhanbad at the Condensed Matter Theory Laboratory, Department of Applied Physics. Duration: August 2017 to April 2018.

Title ***Applications of Geometric Phases in Condensed Matter Physics***

Supervisors **Dr. Amit Kundu, Associate Professor and HOD**

Description We have studied the quantum adiabatic theorem and the introduction of Berry's phase and it's importance in quantum mechanical systems. The complete formalism of Berry's Phase was then studied (Up to Generalized Berry's Phase). Then we studied the applications of various geometric phases in different condensed matter systems and it's application in Quantum Hall Effect. This was a theoretical project work carried out at the Department of Physics, Indian Institute of Engineering Science and Technology, Shibpur. Duration: May to July 2017.

## Conferences and Workshops

- 20th International Workshop on Computational Physics and Materials Science: Total Energy and Force Methods (Online Mode).
  Organized by International Centre for Theoretical Physics, Italy
  Duration : February 2021
- Online Workshop On Accelerated Data Science.
  Organsied by Indian Institute of Technology, Kharagpur
  Duration : February 2021
- User Workshop on Supercomputing
  Organised by Centre for Development of Advanced Computing, India
  Duration : November 2020
- Online conference on Machine Learning for Quantum Simulation
  Organised by Simons Foundation, New York
  Duration : June 2020
- Online Workshop on Python Computing
  Organised by Indian Institute of Science Education and Research, Kolkata
  Duration : June 2020
- Online Faculty Development Programme on Machine Learning and it's Applications
  Organised by Electronics and ICT Academy, Indian Institute of Technology, Roorkee
  Duration : April 2020
- National Conference on Advancements in Spectroscopic Techniques and Materials.
  Organized by Department of Applied Physics, IIT (ISM) Dhanbad
  Duration: March 2018
- National Conference on Liquid Crystals.
  Organized by Department of Applied Physics, IIT (ISM) Dhanbad
  Duration: December 2016
- Attended workshop on night sky watching organized by Department of Physics, Kalyani University using modern technology based reflecting telescope. Duration: February 2013 and October 2013.

## Work Experience

2020-present **Teaching Assistantship**, *Indian Institute of Technology*, Kharagpur, Course : High Performance Computing and it's Applications to Complex Physical Systems.
Conducting hands on session for running Molecular Dynamics simulation of different complex physico-chemical systems and to compute different thermodynamic properties. Parallelized version of the codes are executed on HPC clusters and Supercomputer.

2017–2019 **Online Mentoring**, *IL & FS Education*, Kolkata, Subject: Science.
Helping students of secondary level (Class 8, 9 and 10) of CBSE Board via Geneo App for Physics subject; creating and editing MCQ and subjective questions of CBSE pattern; AI text curation, MCQ curation; Creating/editing sample papers and solving questions according to the latest pattern CBSE class 10 board exam papers of science subject.

2018-2019 **Expert Q and A**, *Chegg India Pvt. Ltd*, India, Subject: Advanced Physics.
Solving questions of Advanced Physics (Undergraduate and Graduate Level) of US based univeristies.

## Achievements

GATE 2019 **Subject : Physics**, *Marks : 32.00*, GATE Score : 467, All India Rank : 939.
Valid upto 2022

IELTS **Academic**, *2019*, Overall: 8.0, CEFR Level: C1.

## Area of Interest

- Computational Materials Science
- Two Dimensional Materials
- Condensed Matter Physics and Computational Physics
- Quantum Mechanics
- Statistical Mechanics
- Mathematical Physics

## Skills

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|---|---|---|---|
| category 1 | Density Functional Theory | category 4 | Quantum Espresso |
| category 2 | Molecular Dynamics and Monte Carlo Simulations | category 5 | LAMMPS |
| category 3 | C and C++ Programming | category 6 | LaTeX |
| category 4 | XmGrace | category 7 | GnuPlot |
| category 5 | Avogadro | category 8 | XCrysden |

## Languages

| | | |
|---|---|---|
| Bengali | Mothertongue | |
| English | Intermediate | *Conversationally good* |

## References


- Dr. Sandeep Kumar Reddy
  Email : skreddy@iitkgp.ac.in
- Dr. Divya Nayar
  Email : Divya.Nayar@mse.iitd.ac.in
- Dr. Pankaj Mishra
  Email : mpankajg@gmail.com
- Dr. Rajsekhar Bhattacharyya
  Email : rbhattacharyya@gmail.com
- Dr. Amit Kundu
  Email : amit.iop@yahoo.com


## Declaration

I hereby declare that the above mentioned information is correct up to my knowledge and I bear the responsibility for the correctness of the above mentioned particular.

**Place**: Kolkata

*Arka Prava Sarkar*