

# Hitendra Sarkar — CV

Address: HNo. 98, Bogchara, Barpeta, Assam, India, 781311

DoB: 28/10/1994 – Nationality: Indian

☎ (+91) 8876091283 • ✉ sarkarhitendra@gmail.com



## Education

---

### Gauhati University, Guwahati

*Doctor of Philosophy, Physics*

2020–2025

### Indian Institute of Technology, Guwahati

*Master of Science, Physics*

*CPI – 6.73/10*

2016–2018

### Tezpur University, Tezpur

*Bachelor of Science, Physics*

*CGPA – 7.96/10*

2013–2016

### Cotton College, Guwahati

*Higher Secondary Examination, Science (Class XII)*

*Percentage – 74.20/100*

2013

### Sadiya Govt. Higher Secondary School, Sadiya

*High School Leaving Certificate Examination (Class X)*

*Percentage – 87.17/100*

2010

## Other Degrees

---

### Computer Education Centre (CEC), Jalukbari

*P.G. Diploma in Computer Application (PGDCA)*

2023–2024

### National Infotech Centre & Management Education (NICME), Sadiya

*Diploma in Computer Application (DCA)*

2010

## Areas of interest

---

### Plasma Physics, Astrophysics

My current research involves the study of nonlinear plasma phenomena relevant to space and astrophysical plasmas, using flux-corrected transport simulations. I also have experience in numerical modelling of accreting Black Holes. Additional interests include Radio Astronomy, Computational Physics, Numerical Analysis, and Machine Learning Techniques.

## Research experience

---

### Gauhati University, Jalukbari

*PhD*

Thesis title: A study on nonlinear plasma phenomena: flux-corrected transport (FCT) simulation

Guide/supervisor : Prof. M.P. Bora, Professor, Gauhati University, Jalukbari, Assam

## Indian Institute of Technology, Guwahati

*Masters project*

Project title: Transonic properties of accretion flow around a rotating black hole

Guide/supervisor : Dr. Santabrata Das, Associate Professor, Indian Institute of Technology Guwahati, Assam

## Tezpur University, Tezpur

*Bachelors project*

Project title: Multiwavelength study of Active Galactic Nuclei

Guide/supervisor : Dr. Rupjyoti Gogoi, Assistant Professor, Tezpur University, Tezpur, Assam

## Publications

---

### Journal Article.....

B. Joardar, **H. Sarkar**, and M.P. Bora, "External charged debris in a flowing plasma : charge fluctuation induced complexity", *Chaos, Solitons & Fractals* 200 117102, (2025)

**H. Sarkar**, and M.P. Bora, "Exploring nonlinearities in a positive ion-negative ion (PINI) plasma: Can other processes mimic debris-induced effects?", *Physics of Plasmas* 32(6) 062305, (2025)

**H. Sarkar**, and M.P. Bora, "Response of a dusty plasma system to external charge perturbations", *Physics of Plasmas* 30(8) 083701, (2023)

### Articles in revision.....

**H. Sarkar**, and M.P. Bora, "Thermal instability and multiphase dynamics in the ISM with polybaric pressure effects", *in revision with MNRAS* (2025)

### Conference proceeding.....

**H. Sarkar**, and M.P. Bora, "Dissipationless Shocks by Moving Charge Debris in a Plasma with Oppositely Charged Dusts," in *Journal of Physics Conference Series* 2957(1), 012020 (2025)

**H. Sarkar**, and M.P. Bora, "Excitation of Pinned Solitons by Moving Charge Debris in a Plasma with Kappa-Distributed Electrons," in *Springer Proceedings in Physics*, (2024), pp. 199–209.

### Book Chapters.....

**H. Sarkar**, and M.P. Bora, "Thermal Instability Simulation using Flux-Corrected-Transport", *Physics Frontiers: Bridging Theories and Experiments (Volume-I)*, ed. by Dr. D. Bhattacharjee and Dr. V.B. Thapa, Assam Science Society, ISBN: 978-81-983738-4-7 (2025), p.126

**H. Sarkar**, and M.P. Bora, "Flowing charged object in plasma: Forced KdV approach", *Emerging Trends in Basic and Applied Sciences - Volume I*, ed. by Dr. P. Handique and Dr. M. Gogoi, Purbayan Publication, ISBN: 978-93-5860-107-7 (2024), p.150

## Awards, honors and achievements

---

**2023**: Received certificate of excellence for outstanding contribution at the 16<sup>th</sup> International Conference on Plasma Science and Applications (ICPSA-2023), December 2023

**2019**: Cleared CSIR-UGC National Eligibility Test for Junior Research Fellowship (NET-JRF) and Lecturership, December 2018

**2019:** Cleared Graduate Aptitude Test in Engineering (GATE) 2019

**2019:** Cleared State Eligibility Test for Lecturership (NE Region) 2019

**2018:** Cleared Common Entrance Examination for Design (CEED) 2018 for admission into Indian Institutes of Technology and Indian Institute of Science

**2016:** Cleared Joint Admission Test for M.Sc. (JAM) 2016 for admission into post-graduate science programs at the Indian Institutes of Technology

**2010:** Anundoram Barooah Award, Government of Assam

**2010:** Oil India Limited Merit Scholarship

## Conferences/ workshops/ schools

---

**2-4 July, 2024:** Physics Frontiers-2024: Bridging Theories and Experiments, organized by Department of Physics, Bhawanipur Anchalik College. Presented a paper titled "*Thermal Instability Simulation using Flux-Corrected-Transport*"

**29 February - 2 March, 2024:** International Conference on Frontiers in Physics and Applied Physics (ICFPAP – 2024), organized by Department of Physics, University of Science and Technology Meghalaya (USTM) and Physics Academy of North East (PANE). Presented a paper titled "*Nonlinear excitations in a photoemission dominated complex plasma with fluctuating dust charges*"

**21-23 February, 2024:** 2<sup>nd</sup> International Conference on Nonlinear Dynamics and Applications (ICNDA 2024), organized by Department of Mathematics, Sikkim Manipal Institute of Technology (SMIT), Sikkim Manipal University. Presented a paper titled "*Excitation of pinned solitons by moving charge debris in a plasma with kappa-distributed electrons*"

**12-14 December, 2023:** 16<sup>th</sup> International Conference on Plasma Science and Applications (ICPSA-2023), organized by University of Lucknow and Asian African Association for Plasma Training (AAAPT). Presented a paper titled "*Nonlinear excitations in a negative ion plasma by moving charged debris*"

**04-08 December, 2023:** Workshop on Finite Element Method: Theory, Computation, and Application (FEMTCA 2023), organized by National Institute of Technology, Tiruchirappalli

**14 October, 2023:** Symposium on Physics: Advances in Research and Knowledge (SPARK) 2023, organized by North Lakhimpur College (Autonomous). Presented a paper titled "*Possibility of Collision-Less Shocks from a Moving Charge-Density Object in a Dusty Plasma with Dust of Opposite Polarities*"

**28-30 December, 2022:** International Conference on Plasma Science and Applications (ICPSA2022), organized by Gauhati University and Asian African Association for Plasma Training (AAAPT). Presented a paper titled "*FCT simulation of Ion acoustic solitons excited by charged space debris*"

**22-24 September, 2022:** National Conference on Recent Developments and Evolving Trends in Plasma Science and Technology & Pre-conference Workshop on Modelling and Simulation of Industrial Plasmas

(BU-Plasma-2022), organized jointly by the Department of Physics, Bharathiar University and the Beam Technology Development Group, BARC

**12-14 December, 2016:** North-East Meet of Astronomers (NEMA-II), Tezpur University and Inter-University Centre for Astronomy and Astrophysics (IUCAA), Pune

**22 June-11 July, 2015:** CCSU Astronomy and Astrophysics Summer School, Cotton College State University, Guwahati

## Skills

---

**Computer:** C, Python, Fortran, R, Mathematica, Originlab, GnuPlot, Matlab, L<sup>A</sup>T<sub>E</sub>X

**Language:** English, Assamese(Native), Bengali, Hindi

## Major courses done

---

**Physics:** Classical Mechanics, Quantum Mechanics, Mathematical Physics, Special Theory of Relativity, General Theory of Relativity, Thermodynamics, Optics, Electromagnetism, Electronics, Solid State Physics, Statistical Mechanics, Electrodynamics, Atomic and Molecular Physics, Nuclear and Particle Physics, Measurement Techniques.

**Mathematics:** Real Analysis, Ordinary Differential Equations, Partial Differential Equations.

**Computer Science:** C Programming, Numerical Methods and Computational Physics.

**PhD Coursework:** Research Methodology, Computer Fundamentals and Programming with Numerical Analysis, Physics (General), Plasma Physics, Research and Publication Ethics.

**Other:** 'The Data Scientists Toolbox' offered by Johns Hopkins University via *couseara.org* (online)

## Teaching Experience

---

**Pub Kamrup College, Baihata Chariali**

*Assistant Professor, Department of Physics*

*August 1, 2025 – Present*

**Post Graduate Courses**.....

**M.Sc. Physics semester III:** Astrophysics and Cosmology-I, Astrophysics and Cosmology-II, Computational Physics

**M.Sc. Physics semester I:** Quantum Mechanics-I, Electrodynamics and Fluid Dynamics

**Under Graduate Courses**.....

**B.Sc. Physics semester V:** Heat & Thermodynamics, Electromagnetic Theory

**B.Sc. Physics semester III:** Electromagnetic Theory

**B.Sc. Physics semester I:** Mathematical Physics & Mechanics

Senior Secondary Courses.....

**H.S. Science 2<sup>nd</sup> year:** Current Electricity

**H.S. Science 1<sup>st</sup> year:** Laws of Motion, Thermodynamics, Kinetic Theory

## Memberships

---

**2016-2018:** Equinox Astronomy Club, IIT Guwahati

**2013-2016:** Student's Science Council, Tezpur University

## Extracurricular

---

**2018:** Cleared Common Entrance Examination for Design (CEED) 2018 for admission into Indian Institutes of Technology and Indian Institute of Science

\*\*\*\*\*