

Ajaz Ahmad Mir (He/Him)

Ph.D. Physics

✉ [ajazmir.physics@gmail.com](mailto:ajazmir.physics@gmail.com)

☎ +91 9103605912

📍 University of Kashmir, North Campus,  
Delina, Baramulla 193103, J&K, India



## Research Interests

- Nonlinear Excitations Induced by Charged Debris.
- Nonlinear Mixing and Synchronization of Waves.
- Instabilities in Strongly Coupled Plasmas.
- Molecular Dynamics Simulations of Strongly Coupled Plasmas.

## Research Experience

Sep 2023 – Nov 2024 ■ **Postdoctoral Fellow** : Institute for Plasma Research, Gandhinagar, Gujarat, India.  
Advisor: Dr. Pintu Bandyopadhyay

## Education

Jul 2018 – Jul 2023 ■ **Ph. D. Physics**: Indian Institute of Technology Jammu, Jammu, India  
Division: First [CGPA 9.00]  
Thesis Title: *Nonlinear Mixing and Synchronization in Dusty Plasma.*  
Thesis Advisor: Dr. Sanat Kumar Tiwari

Jul 2013 – Jun 2015 ■ **M. Sc. Physics**: Aligarh Muslim University, Aligarh, India  
Division: First [74.29 %]  
Thesis Title: *Some Aspects of Proton Emulsion Interactions at 400 GeV.*  
Thesis Advisor: Prof. Shafiq Ahmad

Jul 2010 – Jun 2013 ■ **B. Sc. (Hons.) Physics**: Aligarh Muslim University, Aligarh, India  
Division: First [73.60 %]

2009 ■ **12<sup>th</sup>**: JKBOSE, J&K, India  
Division: Distinction [83.73 %]

2007 ■ **10<sup>th</sup>**: JKBOSE, J&K, India  
Division: Distinction [84.20 %]


## Teaching Experience

Mar 2025 – ■ **Assistant Professor (Contractual)** in University of Kashmir, North Campus, Delina, Baramulla, J&K, 193103, India.





Apr 2018 – Jul 2018 ■ **Lecturer (Contractual)** in Govt. Degree College, Sopore, Baramulla, J&K, 193201, India.

Dec 2016 – Jan 2018 ■ **Assistant Professor (Contractual)** in Islamic University of Science & Technology, Awantipora, Pulwama, J&K, 192122, India.




## Teaching Experience (continued)

Jun 2015 – Dec 2015     **Lecturer (Contractual)** in Govt. Higher Secondary School, Hadipora, Rafiabad, Baramulla, J&K, 193301, India.

## Competitive Career

- 2018     **Graduate Aptitude Test in Engineering (GATE) 2018**  
Subject: *Physics*
-  **J&K State Eligibility Test (JKSET) 2018**  
Subject: *Physical Sciences*
- 2015     **CSIR-NET (Lecturership) December-2015**  
Subject: *Physical Sciences*
- 2013     **IITJAM-2013**  
Subject: *Physics*

## Awards & Honours

-  **Buti Young Scientist Award 2022**  
37<sup>th</sup> National Symposium on Plasma Science & Technology 2022
-  **Best Student Paper Award 2022**  
15<sup>th</sup> International Conference on Plasma Science & Applications (ICPSA) 2022
-  **National Science Day Award 2023**  
Indian Institute of Technology Jammu

## Fellowships & Grants

- 2024     **Student Travel Grant 2024**  
Organization: **ICPSA**  
*17th International Conference on Plasma Science & Applications (ICPSA) 2024*
-  **Student Travel Grant 2024**  
Organization: **AAPPS-DPP**  
*8th Asia-Pacific Conference on Plasma Physics (AAPPS-DPP 2024)*
- 2023     **International Travel Grant 2023**  
Organization: **IIT Jammu, India**  
*50th International Conference on Plasma Science (ICOPS) 2023*
-  **International Travel Support 2023**  
Organization: **DST-SERB, India**  
*50th International Conference on Plasma Science (ICOPS) 2023*
-  **Student Travel Grant 2023**  
Organization: **IEEE**  
*50th International Conference on Plasma Science (ICOPS) 2023*
- 2022     **Student Travel Grant 2022**  
Organization: **American Physical Society**  
*64th Annual Meeting of the APS Division of Plasma Physics (APS-DPP) 2022*
- 2018     **Institute Fellowship**  
Organization: **Ministry of Human Resource and Development, Govt. of India**  
*Doctor of Philosophy*

## Fellowships & Grants (continued)

- 2010 ■ **INSPIRE: Scholarship for Higher Education (SHE)**  
Organization: Department of Science & Technology, Govt. of India  
*Graduation & Post-graduation*

## Skills

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|----------------------------|---|
| Scientific writing         | ■ A good understanding of writing scientific articles.                |
| Coding                     | ■ MATLAB  |
|                            | ■ C++   |
|                            | ■ FORTRAN   |
|                            | ■ Basics of Python and Linux shell scripting                          |
| Software                   | ■ SPIS [Spacecraft Plasma Interactions Software]                      |
|                            | ■ LAMMPS [Large-scale Atomic/Molecular Massively Parallel Simulator]  |
|                            | ■ L <sup>A</sup> T <sub>E</sub> X                                     |
|                            | ■ ParaView  |
|                            | ■ GMSH  |
|                            | ■ Multisim  |
| Kinetic simulations        | ■ Molecular dynamics simulations using LAMMPS.                        |
| Fluid simulations          | ■ Pseudospectral and Finite Difference Methods.                       |
|                            | ■ Flux Corrected Transport Algorithm for coupled fluid-Poisson model. |
| High Performance Computing | ■ Installation and execution of different software packages.          |

## Research Publications

- Mar 2024 ■ Farida Batool, [Ajaz Mir](#), Abhijit Sen and Sanat Tiwari.  
**Nonlinear dispersion relation of dust acoustic waves using the Korteweg-de Vries model.**  
[Phys. Plasmas 31, 034502 \(2024\)](#)
- Mar 2023 ■ [Ajaz Mir](#), Sanat Tiwari, Abhijit Sen, Chris Crabtree, Gurudas Ganguli and John Goree.  
**Synchronization of Dust Acoustic Waves in a forced Korteweg-de Vries-Burgers model.**  
[Phys. Rev. E 107, 035202 \(2023\)](#)
- Jul 2022 ■ Rauoof Wani\*, [Ajaz Mir](#)\*, Farida Batool, and Sanat Tiwari.  
**Rayleigh-Taylor Instability in Strongly Coupled Plasma.**  
[Sci. Rep. 12, 11557 \(2022\)](#) [\* Equal contribution]
- Mar 2022 ■ [Ajaz Mir](#), Sanat Tiwari, and Abhijit Sen.  
**Bispectral analysis of nonlinear mixing in a periodically driven Korteweg-de Vries system.**  
[Phys. Plasmas 29, 032303 \(2022\)](#)
- Nov 2020 ■ [Ajaz A. Mir](#), Sanat K. Tiwari, John Goree, Abhijit Sen, Chris Crabtree, and Gurudas Ganguli.  
**A forced Korteweg-de Vries model for nonlinear mixing of oscillations in a dusty plasma.**  
[Phys. Plasmas 27, 113701 \(2020\)](#) [Editor's Pick]

## Research Publications (continued)





- Under Review    ■ **Ajaz Mir**, *Pintu Bandyopadhyay, Madhurima Choudhury, Krishan Kumar, and Abhijit Sen*  
**Modeling of Experimentally Observed Two-Dimensional Precursor Solitons in a Dusty Plasma by the forced Kadomtsev–Petviashvili Equation.**  
[[Phys Rev E](#)]
- **Ajaz Mir**, *Sanat Tiwari and Abhijit Sen.*  
**Two-Stream Instability in Coulomb One Component Plasma.**  
[[Internal Review](#)]
- **Ajaz Mir**, *Farida Batool, Sanat Tiwari and Abhijit Sen.*  
**Nonlinear Mixing of Waves in a Yukawa One Component Plasma.**  
[[Internal Review](#)]

## Research Conferences

- Dec 2024    ■ Poster Presentation:  
**Study of Two Dimensional Nonlinear Excitations of Charged Object in a Dusty Plasma**  
39<sup>th</sup> National Symposium on Plasma Science & Technology 2024  
Plasma Science Society of India (PSSI)  
Venue: Pandit Deendayal Upadhyay Energy University (PDEU), Gandhinagar 382428, Gujarat, India.
- Jul 2024    ■ Poster Presentation:  
**Excitation of Precursor Solitons due to Charged Space Debris based on the forced Kadomtsev–Petviashvili model**  
10<sup>th</sup> PSSI-Plasma Scholars’ Colloquium 2024  
Venue: Indian Institute of Technology Delhi, New Delhi, 110016, India
- May 2023    ■ Oral Presentation:  
**Synchronization of Nonlinear Waves in Dusty Plasma**  
50<sup>th</sup> International Conference on Plasma Science (ICOPS) 2023  
Venue: Santa Fe, New Mexico, USA
- Dec 2022    ■ Oral Presentation [[Best Student Paper Award 2022](#)]:  
**Synchronization of Dust Acoustic Waves in a forced Korteweg–de Vries–Burgers model**  
15<sup>th</sup> International Conference on Plasma Science & Applications (ICPSA) 2022  
Venue: University of Gauhati, Guwahati, Assam, 781014, India
- Oral Presentation [[Buti Young Scientist Award 2022](#)]:  
**Synchronization of Dust Acoustic Waves in a forced Korteweg–de Vries–Burgers model**  
37<sup>th</sup> National Symposium on Plasma Science & Technology 2022  
Plasma Science Society of India (PSSI)  
Venue: Indian Institute of Technology Jodhpur, Karwar, Rajasthan, 342030, India
- Oct 2022    ■ Oral Presentation:  
**Bispectral Analysis of Nonlinear Mixing in Dusty Plasma**  
64<sup>th</sup> Annual Meeting of the APS Division of Plasma Physics (APS-DPP) 2022  
Venue: Spokane, Washington, USA
- May 2022    ■ Oral Presentation:  
**Bispectral Analysis for Nonlinear Mixing in Dusty Plasma**  
9<sup>th</sup> International Conference on the Physics of Dusty Plasmas (ICPDP) 2022  
Venue: Space Research Institute (IKI), Moscow, Russia

## Research Conferences (continued)

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- Dec 2021     Poster Presentation:  
**Nonlinear mixing in a dusty plasma governed by a periodically driven Korteweg-de Vries model**  
36<sup>th</sup> National Symposium on Plasma Science & Technology 2021  
Plasma Science Society of India (PSSI)  
Venue: Birla Institute of Technology Mesra, Ranchi, Jharkhand, 835215, India
- Jan 2021     Poster Presentation:  
**A forced Korteweg-de Vries model for nonlinear mixing of oscillations in a nonlinear dispersive medium**  
Trends in Physics and Future Prospects (TPFP) 2021  
Venue: Indian Institute of Technology Jammu, Jammu, J & K, 181221, India.
- Jun 2020     Participation:  
Regional e-Symposium on Physics - 2020  
Venue: Indian Institute of Technology Jammu, Jammu, J & K, 181221, India.
- Nov 2019     Poster Presentation:  
**Beat waves in dusty plasma**  
12<sup>th</sup> International Conference on Plasma Science & Applications (ICPSA) 2019  
Venue: University of Lucknow, Lucknow, Uttar Pradesh, 226007, India.


## Research Schools

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- June 2019     Participant:  
SERB School on "**Plasma Processing of Materials**"  
Venue: Indian Institute of Technology Bombay, Powai, Mumbai, 400076, India.



## Peer Reviewer

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- 2022     *Physics of Plasmas*

## Membership

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-  **Student Member** : IEEE Nuclear Plasma Science Society (NPSS)
-  **Life Member** : Plasma Science Society of India (PSSI)

## Referees

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- **Dr. Sanat Kumar Tiwari**  
Department of Physics, Indian Institute of Technology Jammu  
Jammu, Jammu & Kashmir, 181221, India  
✉ [sanat.tiwari@iitjammu.ac.in](mailto:sanat.tiwari@iitjammu.ac.in)  
☎ +91 9725258628
- **Prof. Abhijit Sen**  
Institute for Plasma Research  
Gandhinagar, Gujarat, 382428, India  
✉ [senabhijit@gmail.com](mailto:senabhijit@gmail.com)  
☎ +91 9825051578
- **Dr. Pintu Bandyopadhyay**  
Institute for Plasma Research  
Gandhinagar, Gujarat, 382428, India  
✉ [pintu@ipr.res.in](mailto:pintu@ipr.res.in)  
☎ +91 8141680353
- **Dr. Gurudas Ganguli**  
U. S. Naval Research Laboratory  
Washington, DC 20375, USA  
✉ [guru.ganguli@nrl.navy.mil](mailto:guru.ganguli@nrl.navy.mil)  
☎ 202-767-2401
- **Prof. John Goree**  
Department of Physics and Astronomy, University of Iowa  
Iowa City, IA 52242, USA  
✉ [john-goree@uiowa.edu](mailto:john-goree@uiowa.edu)  
☎ 319-335-1843