Dr. Saswati Roy

Assistant Professor, NITA

Assistant Professor
National Institute of Technology Agartala (NITA), Agartala 799046, Tripura, India
(Aug, 2016 - Present)

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Interests:
Analytical and numerical study of black hole physics, specifically lensing phenomena, trajectory analysis, shadow formation, frame dragging etc.

Education:
- Assam University, Silchar, India — PhD in Theoretical Physics (General Theory of Relativity), 2011-2018
- Assam University, Silchar, India — M.Sc. in Physics, 2000 - 2002, ***University Gold Medalist***

Current Designation:
July 2023 - Present: Assistant Professor at NITA

Awards/Recognitions:
- ***Honorary Associate Professor*** at Indian Centre for Space Physics, Kolkata in Oct'2025
- ***Gold Medal from Assam University*** for first rank in M.Sc. (Physics) in 2002
- ***Kiran Bala Bhattacharjee Memorial Endowment Prize*** for first rank in M.Sc. (Physics) in 2002
- ***Sanskrit Scholarship in Class IX from Govt. of Tripura*** (7th position among the students of Tripura, India)

Academic Membership:
- Honorary Associate Professor at Indian Centre for Space Physics, Kolkata
- Bharatiya Paramparik Gyan Vigyan Samaj (Indian Traditional Knowledge and Science Society), India
- Astronomical Society of India (ASI) (L -2462)
- Indian Association for General Relativity and Gravitation (IAGRG), IUCAA, Pune, India (L - 398)
- Physics Academy of North East (PANE), IITG, Assam, India (LM- 381)

Publications:

1. Kala S., Nandan H., Maithani K., **Roy Saswati** , Abebe A., **Null geodesics, thermodynamics, weak gravitational lensing, and black hole shadow characteristics of a frolov regular black hole with constraints from EHT observations**, Eur. Phys. J. Plus 140, 991 (2025) **(DOI: 10.1140/epjp/s13360-025-06930-9)**

2. Kukreti S., Kala S., Nandan H., Ahmed F., **Roy Saswati** , **Equatorial light bending around a Hairy Kiselev Black Hole,** Nuclear Physics B, 1019, 117124 (2025) **(DOI:10.1016/j.nuclphysb.2025.117124)**

3. **Roy Saswati,** Kala S., Ghosh P., Nandan H., Sen A. K. **, Non-Equatorial Deflection of Light due to Kerr-Newman Black Hole: A Material Medium Approach,** The European Physical Journal C **85, 8, 925 (2025) (DOI: 10.1140/epjc/s10052-025-14659-z)**

4. **Roy Saswati,** Kala S., Singha A., Nandan H., Sen A. K. **, Deflection of light due to Kerr Sen black hole in heterotic string theory using material medium approach,** The European Physical Journal C **85, 7, 772 (2025) (DOI: 10.1140/epjc/s10052-025-14459-5)**

5. Kala S., Nandan H., Abebe A., **Roy Saswati**, **Gravitational lensing around a dual-charged stringy black hole in plasma background**, The European Physical Journal C 84, 10, 1089 (2024) **(DOI: 10.1140/epjc/s10052-024-13362-9)**

6. **Roy Saswati** and Sen A. K., "**Study of Gravitational Deflection of Light ray**", Journal of Physics: Conf. Series 1330, 012002, (2019) **(DOI: 10.1088/1742-6596/1330/1/012002)**

7. **Roy Saswati** and Sen A. K., "**Deflection of Light ray due to a charged body using Material medium approach**", Z. Naturforsch. (A Journal of Physical Science) 72(12) a, 1113-1126 (2017) **(DOI: 10.1515/zna-2017-0186)**

8. **Roy Saswati** and Sen A. K., "**Trajectory of a light ray in Kerr field: A Material medium approach",** Astrophys. Space Sci. 360, 23 (2015) **(DOI:10.1007/s10509-015-2538-6)**

9. **Roy Saswati** and Sen A. K., Trends in Mathematical Science Research (ISBN no. 978-91-920948-4-8) **"Variation of Refractive index due to charged body"**(Proceedings of the National Conference on Trends in Mathematical Science Research (TMSR-2014) held at Assam University, Silchar during 5-6 September, 2014) Ed. B. Purakayastha, SILCHAR SUNGRAPHICS, Assam University, Silchar, 110-115 (Published on 2015)

10. **Roy Saswati** and Sen A. K., Exploring the Cosmos (ISBN no.978-3-8443-9165-7) "**Velocity of a photon like particle in Kerr field using material medium approach**" (Proceedings of the Conference on Astrophysics and Astroparticle Physics held at NBU during Jan 27 & 28, 2011) Ed. A. Bhadra, LAMBERT Academic Publishing Germany, 2011, p 44-50 (published on 23.05.2011) (Book Chapter)

BS-MS, BT-MT, M.Sc Projects:

1. 2025, Mr. Anshul P. Tapase (BT-MT), Study of Charged hairy Kiselev Black hole
2. 2025, Mr. Avinash Singh (BT-MT), Theoretical analysis of Charged hairy Kiselev Black hole
3. 2025, Mr. Kautilya Raghav (BT-MT), Exploring TESS-Detected Exoplanet Characteristics Across Metallicity Environments
4. 2025, Mr. Subhadeep Sinha (BT-MT), Exploring the Dusty Tails of K2-22b and KIC 1255b: A Multi-Wavelength and MCMC-Based Analysis
5. 2025, Miss Sayanika Modak (M.Sc), Gravitational Lensing around Kerr Sen black hole in Plasma background
6. 2024, Mr. Prasanjit Ghosh (BS-MS), Gravitational Deflection of Material Particle due to Schwarzschild Black Hole using Material Medium Approach
7. 2024, Mr. Atanu Singha (BS-MS), Effect of String in Gravitational Deflection of Light due to Kerr-Sen Black Hole using Material Medium Approach
8. 2023, Miss Titiksha Karmakar (BS-MS), Cosmological Red Shift in the Conformal FLRW Metric
9. 2023, Mr. Sajan Noatia (BT-MT), Christoffel Symbol and Derivation of geodesic Equation
10. 2023, Mr. Shubhrajit Deb (BS-MS), Effect of String Theory in GTR

11. 2023, Miss Srestha Kar (BS-MS), Black Hole Dynamics
12. 2023, Mr. Mohammad Jasir (BT-MT), Light curve Analysis of Eclipsing Binaries
13. 2022, Mr. Aswini Bala (BT-MT), Intensity of Gravitationally Lensed Images in Schwarzschild Metric and its Application
14. 2021, Mr. Britant (BT-MT), Frame Dragging in Kerr-Newman Metric
15. 2019, Mr. Siddharth Rastogi (BS-MS), Study of Gravitational Deflection of a Matter Particle using the Material Medium Approach
16. 2018, Mr. Soumen Datta (BS-MS), Refractive index due to Kerr-Newman Spacetime
17. 2017, Mr. Hari Om Mishra (BT-MT), Calculation of relativistic frame dragging due to various gravitating bodies: Schwarzschild body, Kerr body, Reissner-Nordstrom body and Kerr-Newman body
18. 2017, Mr. Sarwar Khan (BS-MS), Effect of Cosmological Constant on the Gravitational Deflection of Light Ray