Subhodeep Sarkar

Ph.D. Scholar in Theoretical Physics
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CURRENT POSITION AND AFFILIATION

Research Scholar
RSS2019005, Semester VII,
Department of Applied Sciences,
Indian Institute of Information Technology (IIIT), Allahabad
Uttar Pradesh, India

EMPLOYMENT

Indian Institute of Information Technology, Allahabad, Uttar Pradesh, India

- Position: Senior Research Fellow and Teaching Assistant, Department of Applied Sciences — July 2021 - Present
- Position: Junior Research Fellow — July 2019 - July 2021
  Project: Near Horizon Structure of Black Holes
  Grant No.: ECR/2017/002124
  Principal Investigator: Dr. Srijit Bhattacharjee
  Funding Agency: Science and Engineering Research Board (SERB), Department of Science and Technology (DST), Government of India

RESEARCH INTERESTS

Gravitational and Black Hole Physics
- Black Hole Perturbation Theory
- Internal Structure of Black Holes
- Semi-classical Aspects of Gravity
- Black Hole Shadows

EDUCATION

Indian Institute of Information Technology, Allahabad, Uttar Pradesh, India

Ph.D., Physics, *Expected:* Summer 2023

- Thesis Title (tentative): *Probing the Near Horizon Structure of Black Holes using Perturbation Theory*
- Supervisor: Dr. Srijit Bhattacharjee, IIIT, Allahabad
- CGPI : 9.36 (as of Sem. V)
- Completed Credits: 60 (Min. Credits: 64)

Jamia Millia Islamia (Central University), New Delhi, India

M.Sc., Physics, June 2018

- CGPA: 9.5 *(Placed in First Class with Distinction)*
- Project Supervisor: Prof. Anjan Ananda Sen
- Topic: The Generalized Proca Action in the Randall-Sundrum Braneworld Scenario
- Special Papers: General Theory of Relativity, Quantum Field Theory, Particle Physics, Classical Field Theory

Asutosh College, University of Calcutta, Kolkata, West Bengal, India

B.Sc.(Honours), Physics, June 2016

- Result: First Class with Honours (*Secured 63.625 %*)

National Gems Higher Secondary School, Kolkata, West Bengal, India

Indian School Certificate Examination - I.S.C. (Higher Secondary), May 2012

- Result: *Secured 96.00% (aggregate)*

Indian Certificate of Secondary Education - I.C.S.E. (Secondary), May 2010

- Result: *Secured 95.40% (aggregate)*

PUBLICATIONS AND PREPRINTS

Published Papers

1. S. Bhattacharjee, S. Sarkar and A. Bhattacharyya, *Scalar perturbations of black holes in Jackiw-Teitelboim gravity*, *Phys. Rev. D* **103** (2021) 024008 [2011.08179].
2. S. Bhattacharjee, S. Kumar and S. Sarkar, *Mass inflation and strong cosmic censorship in a nonextreme BTZ black hole*, *Phys. Rev. D* **102** (2020) 044030 [2005.09705].
3. S. Sarkar, S. Kumar and S. Bhattacharjee, *Can we detect a supertranslated black hole?*, *Phys. Rev. D* **105** (2022) 084001 [2110.03547].

PUBLICATION METRICS

iNSPIRE HEP

Papers: 3
Citations: 21
h-index: 3
Citations/paper (avg): 7

Google Scholar

Papers: 3
Citations: 22
h10-index: 0

Semantic Scholar

Papers: 3
Citations: 15
h-index: 3
Highly Influential Citations: 1

Web of Science/Publons

Papers: 3
Citing Articles: 12
h-index: 2
Times Cited (avg): 4

TEACHING EXPERIENCE

Teaching Assistant, Department of Applied Sciences, IIIT, Allahabad

Engineering Physics — 2021 Odd Semester, 2020 Odd Semester, 2019 Odd Semester
Paper Code: SEGP132C
Program: B.Tech. in IT and ECE
Instructor: Dr. Srijit Bhattacharjee

Biological Data Analytics (Biostatistics) — 2021 Odd Semester, 2020 Odd Semester
Paper Code: SBDA131C
Program: M.Tech. in Bioinformatics
Instructor: Dr. Srijit Bhattacharjee

Computational Methods in Physics using Python (CoMP-Py) — 2021 Summer Break
Program: Short Term Certificate Course
Instructor: Dr. Srijit Bhattacharjee

Numerical Methods for Bioinformatics — 2022 Even Semester, 2021 Even Semester
Program: M.Tech. in Bioinformatics
Instructor: Dr. Srijit Bhattacharjee

Nonlinear Dynamics and Infectious Disease Modeling — 2022 Odd Semester
Program: M.Tech. in Bioinformatics
Instructor: Dr. Srijit Bhattacharjee

SKILLS

Languages:
- English (C1), Bengali (Native), Hindi (Bilingual).

Programming:
- *Experienced in* Python (NumPy, SciPy, Matplotlib), and Mathematica.
- *Familiar with* C/C++, Fortran, Pandas, Numba, Julia, Maple, Cadabra.

Document Creation:
- LaTeX, Markdown.

MEMBERSHIP AND SERVICE

- *Life Member*, **Indian Association for General Relativity and Gravitation (IAGRG)**.

TALKS AND POSTER PRESENTATIONS

Talks

- Testing the Strong Cosmic Censorship Conjecture in anti-de Sitter spacetimes — 28 Jul 2022
  Departmental Seminar, School of Physical Sciences
  Indian Association for the Cultivation of Science, Kolkata
- The Strong Cosmic Censorship Conjecture in Anti-de Sitter Spacetimes — 18 May 2022
  Atlantic General Relativity 2022
  Memorial University of Newfoundland and Labrador, Canada
- Testing the Strong Cosmic Censorship Conjecture in anti-de Sitter spacetimes [*Watch on YouTube*] — 11 Mar 2022
  Testing Aspects of General Relativity
  IIT Gandhinagar, IIIT Allahabad, University of Lethbridge, Canada
- Inner-horizon Instability in BTZ Black Holes — 14 Apr 2021
  21st British Gravity Meeting (BritGrav21)
  University College Dublin, Ireland
- Inner-horizon Instability in BTZ Black Holes — 05 Oct 2020
  Workshop on Mathematical and Computational Approaches for Solving the Source-Free Einstein Field Equations
  ICERM, Brown University, USA

Poster Presentations

- Inner-horizon Instability in BTZ Black Holes — 19 Dec 2020
  31st Meeting of the Indian Association for General Relativity and Gravitation (IAGRG)
  IIT, Gandhinagar on behalf of **IAGRG**

WORKSHOPS, CONFERENCES AND OTHER ACADEMIC ACTIVITIES

- Attended **Numerical Relativity Community Summer School** organized by the **Institute for Computational and Experimental Research in Mathematics (ICERM), Brown University, USA**, 08 - 12 August 2022.
- Attended **First IAGRG School on Gravitation and Cosmology** organized by the Indian Association of General Relativity and Gravitation (IAGRG), 16 - 28 May 2022.
- Attended **Atlantic General Relativity 2022** hosted by the **Memorial University of Newfoundland and Labrador, Canada**, 16 - 19 May 2022.
- Attended **Testing Aspects of General Relativity** hosted by **IIT Gandhinagar**, IIIT Allahabad, **University of Lethbridge, Canada**, 11 - 14 March 2022.
- Attended **21st British Gravity Meeting (BritGrav21)** hosted by the Relativity Group in the School of Mathematics and Statistics at **University College Dublin**, 12 - 16 April 2021.
- Attended **31st Meeting of the Indian Association for General Relativity and Gravitation (IAGRG)** organized by **IIT, Gandhinagar** on behalf of **IAGRG**, 19 - 20 December 2020.
- Attended **Virtual Workshop on Statistical Methods for the Detection, Classification, and Inference of Relativistic Objects** organized by **ICERM, Brown University, USA**, 16 - 20 November 2020.
- Attended **Virtual Workshop on Mathematical and Computational Approaches for the Einstein Field Equations with Matter Fields** organized by **ICERM, Brown University, USA**, 26 - 30 October 2020.
- Attended **Virtual Workshop on Workshop on Mathematical and Computational Approaches for Solving the Source-Free Einstein Field Equations** organized by **ICERM, Brown University, USA**, 05 - 09 October 2020.
- Attended **Online Workshop on Testing GR using Gravitational Waves** organized by **IIT, Gandhinagar** and **IACS, Kolkata**, 13 - 14 August 2020.
- Attended **Student Talks on Trending Topics in Theory (ST4) 2020**, 04 - 14 July 2020.
- Volunteered for **Applications of Data Science in Astrophysics and Gravitational Wave Research (DSAP) 2019**, organized by **IIIT, Allahabad**, 01 - 03 November 2019.
- Volunteered for **XXXIV Annual Indian Association of Physics Teachers (IAPT) Convention 2019** organized by the Department of Applied Sciences, **IIIT, Allahabad**, 13 - 15 October 2019.
- Volunteered for **National Seminar on Recent Advances & Innovations in Physics Teach-**

ing and Research (RAIPTR) 2019 organized by the Department of Applied Sciences, **IIIT, Allahabad**, 13 - 15 October 2019.

ACADEMIC VISITS, PROJECTS AND INTERNSHIPS

Academic Visits

Indian Association for the Cultivation of Science, Kolkata
Host: Dr. Sumanta Chakraborty
Period: 11 Jul 2022 to 05 Aug 2022

Project Student Dec 2018 to Mar 2019

Saha Institute of Nuclear Physics
Supervisor: Prof. Koushik Dutta
Topic: Vector Dark Matter Production at the End of Inflation

M.Sc. Project Student Jul 2017 to May 2018

Centre for Theoretical Physics,
Jamia Millia Islamia
Supervisor: Prof. Anjan Ananda Sen
Topic: Gravitation (Basics of General Relativity, Modified Theories of Gravity, Generalized Proca Theories, Warped Geometry and the Randall-Sundrum Model)

Summer Student May 2017 to Jul 2017

Department of Theoretical Physics,
Indian Association for the Cultivation of Science
Supervisor: Prof. Dilip Kr. Ghosh
Topic: A Reading Course on Quantum Field Theory

Visiting Student Dec 2016 to Jan 2017

Quantum Information and Computation Group,
Harish-Chandra Research Institute
Supervisor: Prof. Ujjwal Sen
Topic: A Reading Course on Quantum Entanglement and Quantum Information Theory

REFERENCES

Prof. Srijit Bhattacharjee
Assistant Professor of Physics,
Department of Applied Sciences, E-mail: srijitb@iiita.ac.in
IIIT, Allahabad.

Prof. Lekha Nair
Former Head and Professor of Physics,
Department of Physics, E-mail: lnair@jmi.ac.in
Jamia Millia Islamia.

Prof. Somasri Sen
Associate Professor of Physics,
Department of Physics, E-mail: ssen@jmi.ac.in
Jamia Millia Islamia.

Prof. Anjan Ananda Sen
Professor of Physics,
School of Arts and Sciences, E-mail: anjan.sen@ahduni.edu.in
Ahmedabad University.
Centre for Theoretical Physics,
Jamia Millia Islamia

Prof. Tabish Qureshi
Director and Professor of Physics,
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Jamia Millia Islamia.

CONTACT INFORMATION

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OTHER INFORMATION

Date of Birth: July 17, 1993
Nationality: Indian
Date of C.V.: August 15, 2022