Subhodeep Sarkar

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

Research Scholar
RSS2019005, Semester IV,
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: Junior Research Fellow — July 2019 - Present
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

EDUCATION

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

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

- Supervisor: Dr. Srijit Bhattacharjee, IIIT, Allahabad

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].

TEACHING EXPERIENCE

Teaching Assistant, Department of Applied Sciences, IIIT, Allahabad

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

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

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

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

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

TALKS AND POSTER PRESENTATIONS

Talks

- Inner-horizon Instability in BTZ Black Holes — 14 April 2021
  21st British Gravity Meeting (BritGrav21
  University College Dublin, Ireland
- Inner-horizon Instability in BTZ Black Holes — 05 October 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 December 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 **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 Teaching and Research (RAIPTR) 2019** organized by the Department of Applied Sciences, **IIIT, Allahabad**, 13 - 15 October 2019.

PROJECTS AND INTERNSHIPS

Project Student Dec 2018 to Mar 2019
Saha Institute of Nuclear Physics, Kolkata
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

SKILLS

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

Programming:
- *Proficient in* Python (NumPy, SciPy, Matplotlib), and Mathematica.
- *Experienced in* C/C++, FORTRAN, Java, Pandas, Numba, Julia, Maple.

Document Creation:
- LaTeX, Markdown.

REFERENCES

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

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

Prof. Somasri Sen
Assistant 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

Prof. Tabish Qureshi
Director and Professor of Physics
Centre for Theoretical Physics E-mail: tabish@ctp-jamia.res.in
Jamia Millia Islamia

CONTACT INFORMATION

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Prayagraj, Uttar Pradesh, India 211015.
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E-mail: subhodeep.sarkar1@gmail.com, rss2019005@iiita.ac.in

OTHER INFORMATION

Date of Birth: July 17, 1993
Nationality: Indian
Religion: Non-Practicing Hindu
Date of C.V.: June 30, 2021