
Subhodeep Sarkar

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

Research Fellow

- Centre for Theoretical Physics, Jamia Millia Islamia, New Delhi, India.
- Department of Applied Sciences, Indian Institute of Information Technology (IIIT), Allahabad Uttar Pradesh, India.

EMPLOYMENT

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

- Position: Junior Research Fellow Feb 2023 – Present
Department: Centre for Theoretical Physics
Grant No.: CRG/2020/004347
Principal Investigator: Prof. Anjan Ananda Sen
Funding Agency: Science and Engineering Research Board (SERB),
Department of Science and Technology (DST), Government of India

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

- Position: Senior Research Fellow Jul 2021 – Apr 2022
Department: Applied Sciences
- Position: Junior Research Fellow Jul 2019 – Jul 2021
Department: Applied Sciences
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

Gravitation and Black Hole Physics

- Black Hole Perturbation Theory
- Quasi-normal Modes of Black Holes
- Internal Structure of Black Holes
- Semi-classical Aspects of Gravity
- Gravitational Lensing and Black Hole Shadow

EDUCATION

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

Ph.D., Physics, *Expected*: Winter 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

Preprints

1. **Subhodeep Sarkar**, Mostafizur Rahman and Sumanta Chakraborty, *Perturbing the perturbed: Stability of quasi-normal modes in presence of a positive cosmological constant*, 2304.06829 [{INSPIRE}](#).

Published Papers

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

PUBLICATION
METRICS

INSPIRE HEP

Papers: 4
Citations: 25
h-index: 3
Citations/paper (avg): 6.3

Google Scholar

Papers: 4
Citations: 27
h-index: 3
i10-index: 2

Semantic Scholar

Papers: 4
Citations: 22
h-index: 3
Highly Influential Citations: 2

Web of Science/Publons

Papers: 3
Citing Articles: 17
h-index: 3
Times Cited (avg): 5.67

TEACHING
EXPERIENCE

Teaching Assistant, Department of Applied Sciences, IIIT, Allahabad

Engineering Physics	2022 Odd Semester
Paper Code: SEGP132C	2021 Odd Semester
Program: B.Tech. in IT and ECE	2020 Odd Semester
Instructor: Dr. Srijit Bhattacharjee	2019 Odd Semester

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

	<p>Computational Methods in Physics using Python (CoMP-Py) Program: Short Term Certificate Course Instructor: Dr. Srijit Bhattacharjee</p>	2021 Summer Break
	<p>Numerical Methods for Bioinformatics Program: M.Tech. in Bioinformatics Instructor: Dr. Srijit Bhattacharjee</p>	2022 Even Semester 2021 Even Semester
	<p>Nonlinear Dynamics and Infectious Disease Modeling Program: M.Tech. in Bioinformatics Instructor: Dr. Srijit Bhattacharjee</p>	2022 Odd Semester
MENTORING	<p>Assisted <i>Prof. Anjan Ananda Sen</i> in supervising the following students at CTP, Jamia Millia Islamia</p> <ul style="list-style-type: none"> • Nargis Rashid (Jamia Millia Islamia), M.Sc. Thesis on <i>Black Holes and Quasi-normal Modes in Modified Gravity</i>, 2023. <p>Assisted <i>Dr. Srijit Bhattacharjee</i> in supervising the following students at IIIT, Allahabad</p> <ul style="list-style-type: none"> • Kayyum Yusufali Sayyad (IIIT, Allahabad), M.Tech. Thesis on <i>Infectious Disease Modeling</i>, 2023 • Sanchari Biswas (Christ University, Bangalore), M.Sc. Thesis on <i>Black Hole Shadow</i>, 2022. • Ashley Chraya (IISER Mohali), Summer Project on <i>Quasi-normal Modes of Black Holes</i>, 2021. 	
OTHER ACADEMIC ACHIEVEMENTS	<p>National Examinations</p> <ul style="list-style-type: none"> • Qualified GATE 2019 (Rank: 993, Score: 462). • Qualified IIT JAM 2016 (Rank: 863). • Ranked in the top 1% nationwide in the Indian School Certificate Examination 2012. 	
SKILLS	<p>Languages:</p> <ul style="list-style-type: none"> • English (C1), Bengali (Native), Hindi (Bilingual). <p>Programming:</p> <ul style="list-style-type: none"> • <i>Experienced in Python (Scientific Stack), and Mathematica.</i> • <i>Familiar with C/C++, Fortran, Julia, Maple, Cadabra.</i> <p>Document Creation:</p> <ul style="list-style-type: none"> • LaTeX, Markdown. 	
MEMBERSHIP AND SERVICE	<p>Academic Bodies</p> <ul style="list-style-type: none"> • <i>Life Member, Indian Association for General Relativity and Gravitation (IAGRG).</i> 	
TALKS AND POSTER PRESENTATIONS	<p>Talks</p> <ul style="list-style-type: none"> • <i>Testing the Strong Cosmic Censorship Conjecture in Anti-de Sitter spacetimes</i> 28 Jul 2022 Departmental Seminar, School of Physical Sciences Indian Association for the Cultivation of Science, Kolkata • <i>The Strong Cosmic Censorship Conjecture in Anti-de Sitter Spacetimes</i> 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, IIT 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

Assisted in organizing

- Short Term Certificate Course on **Computational Methods in Physics using Python (CoMP-Py) 2021**, IIT, Allahabad, 01 May – 10 July 2021.
- Vritika Seminars on **Computational and Theoretical Aspects of Gravitational Physics (CompGravIIITA)**, IIT, Allahabad, June – July, 2021.
- **Applications of Data Science in Astrophysics and Gravitational Wave Research (DSAP) 2019**, IIT, Allahabad, 01 – 03 November 2019.
- **XXXIV Annual Indian Association of Physics Teachers (IAPT) Convention 2019**, IIT, Allahabad, 13 – 15 October 2019.
- **National Seminar on Recent Advances & Innovations in Physics Teaching and Research (RAIPTR) 2019**, IIT, Allahabad, 13 – 15 October 2019.

Attended

- **Testing Aspects of General Relativity II** hosted by IIT Gandhinagar, IIT Allahabad, University of Lethbridge, Canada, 11 – 13 April 2023.
- **Numerical Relativity Community Summer School** organized by the Institute for Computational and Experimental Research in Mathematics (ICERM), Brown University, USA, 08 – 12 August 2022.
- **First IAGRG School on Gravitation and Cosmology** organized by the Indian Association of General Relativity and Gravitation (IAGRG), 16 – 28 May 2022.
- **Atlantic General Relativity 2022** hosted by the Memorial University of Newfoundland and Labrador, Canada, 16 – 19 May 2022.
- **Testing Aspects of General Relativity** hosted by IIT Gandhinagar, IIT Allahabad, University of Lethbridge, Canada, 11 – 14 March 2022.
- **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.
- **31st Meeting of the Indian Association for General Relativity and Gravitation (IAGRG)** organized by IIT, Gandhinagar on behalf of IAGRG, 19 – 20 December 2020.
- **Virtual Workshop on Statistical Methods for the Detection, Classification, and Inference of Relativistic Objects** organized by ICERM, Brown University, USA, 16 – 20 November 2020.
- **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.
- **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.
- **Online Workshop on Testing GR using Gravitational Waves** organized by IIT, Gandhinagar and IACS, Kolkata, 13 – 14 August 2020.

WORKSHOPS,
CONFERENCES
AND OTHER
ACADEMIC
ACTIVITIES

- **Student Talks on Trending Topics in Theory (ST4) 2020**, 04 – 14 July 2020.

ACADEMIC
VISITS**National Visits**

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

PROJECTS AND
INTERNSHIPS

- 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. Anjan Ananda Sen
Professor of Physics,
Centre for Theoretical Physics,
Jamia Millia Islamia
E-mail: aasen@jmi.ac.in
- Prof. Srijit Bhattacharjee
Assistant Professor of Physics,
Department of Applied Sciences,
IIT, Allahabad.
E-mail: srijitb@iiita.ac.in
- Prof. Lekha Nair
Former Head and Professor of Physics,
Department of Physics,
Jamia Millia Islamia.
E-mail: lnair@jmi.ac.in
- Prof. Somasri Sen
Associate Professor of Physics,
Department of Physics,
Jamia Millia Islamia.
E-mail: ssen@jmi.ac.in
- Prof. Tabish Qureshi
Hony. Director and Professor of Physics,
Centre for Theoretical Physics,
Jamia Millia Islamia.
E-mail: tabish@ctp-jamia.res.in

CONTACT
INFORMATION

Centre for Theoretical Physics,
Jamia Millia Islamia (Central University),
Bab-e Maulana Abul Kalam Azad (Gate No. 7),
Jamia Nagar, Okhla, New Delhi, Delhi 110025.

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Primary Email ID: subhodeep.sarkar1@gmail.com
Other Email IDs: rss2019005@iiita.ac.in, subhodeep@ctp-jamia.res.in

OTHER
INFORMATION

Date of Birth: July 17, 1993
Nationality: Indian
Date of C.V.: July 7, 2023