

Soumendra Kishore Roy

✉ sroy@cita.utoronto.ca  [SoumendraRoy](#)  soumendraroy.github.io

Designation

Canada Impact+ Postdoctoral Fellow
CITA Postdoctoral Fellow
Canadian Institute of Theoretical Astrophysics

Education

- 2026** PhD in Physics, [Stony Brook University, NY, USA](#)
Advisor: Will M. Farr
- 2020** Master of Science in Physics, [Presidency University, Kolkata, India](#)
- 2018** Bachelor of Science in Physics (Major), [Presidency University, Kolkata, India](#)

Research Positions

- 2026 - Present** Postdoctoral Fellow at Canadian Institute of Theoretical Astrophysics
- 2021 - Present** Guest Researcher at Center for Computational Astrophysics

Research Interest

My research focuses on gravitational-wave astronomy, with particular interest in population and cosmological parameter inference. My core expertise lies in modern statistical methods, especially machine learning and hierarchical Bayesian inference, which I use to connect models of binary stellar evolution with the observed population of compact binary mergers and understand their origins.

List of Publications

ADS **INSPIRE-HEP** **ORCID** **arXiv**

7 short-author publications, including **5 first-author** and **2 second-author papers**

3 LIGO–Virgo–KAGRA (LVK) collaboration papers with significant contributions

Number of citations: 418 (excluding LVK papers without significant contributions)

h-index: 6 (excluding LVK papers without significant contributions)

1st/2nd Author Papers:

7. A Mid-Thirties Crisis: Dissecting the Properties of Gravitational Wave Sources Near the 35 Solar Mass Peak; **Soumendra Kishore Roy**, Lieke van Son, Will M. Farr; Published in the Classical and Quantum Gravity special issue “Gravitational Wave Physics and Astrophysics Ten Years After GW150914” [Class. Quantum Grav. 42 225008 \(2025\)](#); [arXiv:2507.01086](#).
6. Cosmology with Binary Neutron Stars: Does the Redshift Evolution of the Mass Function Matter? **Soumendra Kishore Roy**, Lieke van Son, Ananya Ray, Will M. Farr; [ApJL 985 L33 \(2025\)](#); [arXiv:2411.02494](#).
5. Not just winds: why models find binary black hole formation is metallicity dependent, while binary neutron star formation is not; Lieke van Son, **Soumendra Kishore Roy** et al.; [ApJ 979 209 \(2025\)](#); [arXiv:2411.02484](#).
4. Effective General Relativistic Description of Jamming in Granular Matter; **Soumendra Kishore Roy**, Pratyusava Baral, Ratna Koley, Parthasarathi Majumdar; [arXiv:2011.01194](#).

3. Probing the Post-Minkowskian Approximation using Recursive Addition of Self-Interactions; **Soumendra Kishore Roy**, Ratna Koley, Parthasarathi Majumdar; [Phys. Rev. D 102, 084045 \(2020\)](#); [arXiv:2007.02887](#).
2. Prospects of Probing Dark Energy with eLISA: Standard versus Null Diagnostics; Pratyusava Baral, **Soumendra Kishore Roy**, Supratik Pal; [MNRAS, 500, 2896 \(2021\)](#); [arXiv:2005.07231](#).
1. Kinematics of Two-Particle Scattering in Black Hole Backgrounds; **Soumendra Kishore Roy**, Ratna Koley, Parthasarathi Majumdar, [Phys. Rev. D 100, 064052 \(2019\)](#); [arXiv:1905.09089](#).

Collaboration Papers with Significant Contributions:

3. GWTC-5.0: Population Properties of Merging Compact Binaries; The LVK Collaboration (including **Soumendra Kishore Roy**); Under Review in ApJL; [arXiv:2605.27226](#).
2. GWTC-4.0: Population Properties of Merging Compact Binaries; The LVK Collaboration (including **Soumendra Kishore Roy**); [ApJL 1005 L51 \(2026\)](#); [arXiv:2508.18083](#).
1. GWTC-4.0: Updating the Gravitational-Wave Transient Catalog with Observations from the First Part of the Fourth LIGO–Virgo–KAGRA Observing Run; The LVK Collaboration (including **Soumendra Kishore Roy**); [ApJL 1004 L22 \(2026\)](#); [arXiv:2508.18082](#).

Selected Presentations

1. **Theroy Group Meeting**, CIERA, Northwestern — Talk (January 2026)
2. **GW Focused Session**, CITA, Canada — Talk (January 2026)
3. **GW Focused Session**, CITA, Canada — Talk (Online, December 2025)
4. **Prospects in Theoretical Physics 2025**, IAS, Princeton, USA — Contributed Poster (July 2025)
5. **Institute for Cosmic Ray Research**, Kashiwa, Japan — Talk (April 2025)
6. **Research Center for the Early Universe**, Tokyo, Japan — Talk (April 2025)
7. **Stellar black hole formation and detection**, YITP, Kyoto, Japan — Contributed Talk (March 2025)
8. **Princeton Astro-Coffee**, Princeton University, USA — Talk (November 2024)
9. **GWPAW 2024**, Birmingham, UK — Contributed Poster (May 2024)
10. **APS April Meeting 2024**, Sacramento, California, USA — Contributed Talk (April 2024)
11. **CosmoMingle 2024**, Indian Statistical Institute, Kolkata, India — Talk (Jan 2024)
12. **Indian Statistical Institute Colloquium**, Kolkata, India — Invited Talk (June 2023)
13. **Center for Computational Astrophysics**, New York, USA — [GW Group Meeting Tutorial](#) (November 2022)
14. **31st Meeting of Indian Association of General Relativity and Gravitation**, IIT Gandhinagar, India — Contributed Talk (Online, December 2020)
15. **Mathematical and Computational Approaches for Solving the Source- Free Einstein Field Equations**, ICERM, Brown University, USA — Contributed Lightning Talk (Online, October 2020)
16. **LISA Symposium XIII** — Pre-Recorded Contributed Talk (Online, September 2020)
17. **30th Meeting of Indian Association for General Relativity and Gravitation**, BITS Pilani Hyderabad, India — Contributed Poster (January 2019)

Selected Workshops

1. **LIGO-Virgo-KAGRA Collaboration Meeting**, Northwestern University, USA (March 2023)
2. **GW Open Data Workshop**, Center for Computational Astrophysics, NY, USA (May 2022)
3. **Gravitational Wave Astronomy**, International Center of Theoretical Studies, Bengaluru, India (July 2019)
4. **Advanced School on Gravitational Wave**, Presidency University, Kolkata, India (December 2016)

Awards and Fellowships

1. **Junior Research Fellow**, Department of Higher Education, Ministry of Human Resource Development, India, 2019 (Awarded to the top 0.5% Students out of 25,000 Examinees)
2. **ICTS S.N. Bhatt Memorial Excellence Fellowship 2018** (Awarded to the top 15 Students among ~1000 Applicants)
3. **INSPIRE Fellow**, Department of Science and Technology, India, 2015, (awarded to the top 1% students out of 300,000 students at the higher secondary (+2) level, who are pursuing bachelors degrees in the sciences)

Teching Experiences

1. **Laboratory for Classical Physics**, PHY133, Teaching Assistant, Stony Brook University (Fall 2026)
2. **Astronomy**, AST203, Teaching Assistant, Stony Brook University (Spring 2025)
3. **Introduction to Planetary Sciences**, AST205, Teaching Assistant, Stony Brook University (Fall 2024)
4. **Laboratory for Classical Physics**, PHY133, Teaching Assistant, Stony Brook University (Summer 2023)
5. **Undergraduate Astronomy Lab**, AST112, Course Instructor, Stony Brook University (Spring 2022 & Spring 2023)
6. **Introduction to Solar System**, AST101 & AST105, Teaching Assistant, Stony Brook University (Fall 2021, Fall 2023 & Fall 2024)
7. Taught parts of several courses at the Master's level, including **the functional quantization of Φ^4 theory, the derivation of the FLRW metric using general relativity, inflation, and Gauss quadrature**, Presidency University, Kolkata, India

Academic Advising Experience

Mehmet Bukucu , University of Toronto, Canada	Aug 2026 – Present
Mehmet is a fourth-year Astrophysics undergraduate, working on distinguishing BBH formation channels using spin properties. Co-advised with Prof. Maya Fishbach.	
Aritra Bakshi , Presidency University, Kolkata, India	Jan 2025 – Present
Aritra is a fourth-year Physics undergraduate, working on understanding the systematics in joint population, cosmological, and neutron-star equation-of-state inference with next-generation BNS observations.	
Dwaipayan Mukherjee , Presidency University, Kolkata, India	Jan 2025 – Present
Dwaipayan is a fourth-year Physics undergraduate, working on the neutron-star-black-hole mass-gap discrepancy between electromagnetic and gravitational-wave observations.	

International collaborations

1. **Compact Object Mergers: Population Astrophysics and Statistics (COMPAS)** member since 2024
2. **LIGO** member since 2022 as part of the LIGO-Virgo-KAGRA Collaboration

3. **Cosmic Explorer Consortium** member since 2022

Scientific Outreach

1. **Invited Public Talk to School Students**, Jodhpur Park Boys School, Kolkata, India. Topic: Gravitational Waves (Online, September 2020)
2. **Invited Public Talk to College Students**, Presidency University, Kolkata, India. Topic: Gravitational Waves (Online, September 2020)
3. **One of the Founders and Co-organizers** of the Presidency Physics Academic Fest, Presision, which included the **First Undergraduate Symposium in India**

Selected Professional Services

1. **SOC Member**, Undergraduate Physics Symposium, [Presision 2020](#) & [Presision 2018](#) (September 2020 & August 2018)
2. **Volunteer**, Square Kilometer Array, Vigyan Samagam, The Mega Science Exhibition, Kolkata, India (December 2019)

References

1. **Prof. Will M. Farr**, Associate Professor, Stony Brook University, NY and Group Leader, Gravitational Wave Astronomy, Center for Computational Astrophysics, Flatiron Institute, NY, USA
Connection: Ph.D. Advisor
Email: will.farr@stonybrook.edu
2. **Prof. Maya Fishbach**, Assistant Professor, Canadian Institute of Theoretical Astrophysics, University of Toronto, Canada
Connection: Postdoc Mentor
Email: maya.fishbach@utoronto.ca
3. **Prof. Lieke van Son**, Assistant Professor, Institute for Mathematics, Astrophysics and Particle Physics, Radboud University, Nijmegen, Netherlands
Connection: Research Mentor
Email: lieke.vanson@ru.nl
4. **Prof. Reed Essick**, Assistant Professor, Canadian Institute of Theoretical Astrophysics, University of Toronto, Canada
Connection: Postdoc Mentor
Email: essick@cita.utoronto.ca