

Kanchan Soni

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CONTACT DETAILS

Center for Gravitational Waves Astronomy and Astrophysics
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PERSONAL DETAILS

Gender: Female
Date of birth: January 26, 1995
Nationality: Indian

EMPLOYMENT

- **Syracuse University, New York, USA** 2024-present
Postdoctoral Researcher

EDUCATION

- **IUCAA, India** 2018-2024
Ph.D in Physics
Thesis: *“Efficient searches for compact binary coalescences and science in the LIGO-India era”*
Advisor: Prof. Sanjit Mitra
 - **IISER Thiruvananthapuram, India** 2013-2018
BS-MS dual degree in Physics
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AWARDS AND ACHEIVEMENTS

- **University Grants Commission (UGC), India** 2018-2024
 - **INSPIRE Fellowship**, Department of Science and Technology, India 2013-2018
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RESEARCH INTERESTS

- Gravitational wave searches and data analysis
 - Development of efficient search analysis techniques for the current and next-generation gravitational wave detectors
 - Characterisation and reduction of noise in the current gravitational wave detectors
 - Astrophysical interpretation of binary black hole and binary neutron star population from LIGO and next-generation gravitational wave detectors
 - Multi-messenger Astronomy with future terrestrial and space-based detectors
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TECHNICAL SKILLS

- **Gravitational-wave Data Analysis Tools:** PyCBC, BILBY
 - **Astrophysical Simulation Tools:** COSMIC
 - **Programming Language:** Python, C, C++, Shell Script, MATLAB, Mathematica
 - **High Performance Computing Skills:** Experience with MPI/OpenMP, parallel programming using Python for HTC clusters
 - **Tools/Frameworks:** L^AT_EX, Git
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CONFERENCE PRESENTATION

- GWPAW 2024 2024 (in person)
- 14th Edoardo Amaldi Conference on Gravitational Waves 2021 (Virtual)
- LIGO-Virgo-KAGRA Collaboration Meeting 2021 (Virtual)

OTHER CONFERENCES AND WORKSHOPS

- Invited participation: Detection and Analysis of Gravitational Waves in the era of Multi-Messenger Astronomy [LINK](#) 2024 (Virtual)
- Participation: ICTS school on Gravitational Wave Astronomy, India 2022 (in person)
- Participation: School on Black Holes and Gravitational Waves, IIT Madras, India 2022 (Virtual)
- Presentation and Participation: [PyCBC remote meeting](#) 2021 (Virtual)
- Participation: ICTS school on Gravitational Wave Astronomy, India 2021 (Virtual)
- Participation: Indian Association for General Relativity and Gravitation (IAGRG) conference, IIT Gandhinagar, India 2020 (Virtual)

SEMINARS & TALKS

- CCRG Lunch Talk on "Efficient searches for gravitational waves from compact binary coalescences in the current and future detectors", RIT, USA 2024
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LIMITED AUTHOR PUBLICATIONS

1. **Kanchan Soni**, Alexander H. Nitz, "[Hierarchical searches for subsolar-mass binaries and the third-generation gravitational wave detector era](#)", *ApJ* 978 69 (2024) [[arXiv:2409.11317](#)]
2. **Kanchan Soni**, Aditya Vijaykumar, Sanjit Mitra, "[Assessing the potential of LIGO-India in resolving the Hubble Tension](#)" [[arXiv:2409.11361](#)]
3. **Kanchan Soni**, S. Mitra, S. Dhurandhar, "[Obtaining statistical significance of gravitational wave signals in hierarchical search](#)", *Phys. Rev. D* 109, 024046 (2024) [[arXiv:2309.00019](#)]
4. Bhooshan Gadre, **Kanchan Soni**, Shubhanshu Tiwari, Antoni Ramos-Buades, Maria Haney, Sanjit Mitra, "[Detectability of eccentric binary black holes with PyCBC and cWB pipelines during the third observing run of LIGO-Virgo-KAGRA](#)", *Phys. Rev. D* 110, 044013 (2024) [[arXiv:2405.04186](#)]
5. **Kanchan Soni**, B. Uday Gadre, S. Mitra, S. Dhurandhar, "[Hierarchical search for compact binary coalescences in the Advanced LIGO's first two observing runs](#)", *Phys. Rev. D* 105, 064005 (2022) [[arXiv:2106.08925](#)]

6. Koustav Chandra, V. Villa-Ortega, T. Dent, C. McIsaac, Archana Pai, I.W. Harry, G.S. Cabourn Davies, and **Kanchan Soni**, [Optimized PyCBC search for gravitational waves from intermediate-mass black hole mergers](#), Phys. Rev. D **104**, 042004 (2022) [[arXiv:2106.00193](#)]
7. Koustav Chandra, Archana Pai, V. Villa-Ortega, T. Dent, C. McIsaac, I.W. Harry, G.S. Cabourn Davies, and **Kanchan Soni**, [Salient features of the optimised PyCBC IMBH search](#) [[arXiv:2110.01879](#)]

LIGO-VIRGO-KAGRA PUBLICATIONS (Contributions)

1. The LIGO Scientific Collaboration, the Virgo Collaboration, the KAGRA Collaboration, “[Search for intermediate mass black hole binaries in the third observing run of Advanced LIGO and Advanced Virgo](#)”, Phys. Rev. D **100**, 064064 (2021), [arXiv:2105.15120](#)
2. D Davis et al, “[LIGO detector characterization in the second and third observing runs](#)”, Class. Quantum Grav. **38** 135014 (2021)
3. The LIGO Scientific Collaboration, the Virgo Collaboration, the KAGRA Collaboration, “[GWTC-2: Compact Binary Coalescences Observed by LIGO and Virgo during the First Half of the Third Observing Run](#)”, Phys. Rev. X **11**, 021053 (2021), [arXiv:2010.14527](#)
4. The LIGO Scientific Collaboration, the Virgo Collaboration, the KAGRA Collaboration, “[GWTC-2.1: Deep Extended Catalog of Compact Binary Coalescences Observed by LIGO and Virgo During the First Half of the Third Observing Run](#)”, [arXiv:2108.01045](#)
5. The LIGO Scientific Collaboration, the Virgo Collaboration, the KAGRA Collaboration, “[GWTC-3: Compact Binary Coalescences Observed by LIGO and Virgo During the Second Part of the Third Observing Run](#)”, [arXiv:2111.03606](#)

Memberships & Affiliations

- LIGO-Virgo-KAGRA Collaboration 2019-2023

REFeree & REVIEWER

- Astrophysical Journal (ApJ)

TEACHING EXPERIENCE

- Spandan Shekar (MS student) 2024-present
IISER Bhopal, India
- Kajol Shelke (MS student), 2024
Pune University, India
- Teaching Assistant for Introduction to General Relativity 2021
Graduate school program, IUCAA, Pune, India
- Sanjeet Sahastrabudhi (MS student), 2020-2021
Fergusson College, Pune, India
- Akshita Mittal (MS student), 2020-2021
IISER Thiruvananthapuram, India

**PUBLIC
OUTREACH**

- Participated and mentored students in [GW Open Science Data Workshop](#) 2022
 - Active member of [LIGO-India Education and Public Outreach](#) 2020-2022
 - Online introductory talk on “Detection of Gravitational waves” Naxxatra Science, India 2021
 - Online invited talk titled “Listening to Cosmic Whispers” ([LINK](#)) IISER Thiruvananthapuram, India 2021
 - Published a science summary on “Search for intermediate mass black hole binaries in the third observing run of Advanced LIGO and Advanced Virgo” for LIGO-Virgo-KAGRA (LVK) public outreach ([LINK](#)) 2021
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