Kanchan Soni

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CONTACT DETAILS

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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

AWARDS AND ACHEIVEMENTS

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

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:** LaTeX, Git

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

- Participated: ICTS school on Gravitational Wave Astronomy, India — 2022 (in person)
- Participated: School on Black Holes and Gravitational Waves, IIT Madras, India — 2022 (Virtual)
- Presented and participated: PyCBC remote meeting — 2021 (Virtual)
- Participated: ICTS school on Gravitational Wave Astronomy, India — 2021 (Virtual)
- Participated: Indian Association for General Relativity and Gravitation (IAGRG) conference, IIT Gandhinagar, India — 2020 (Virtual)

LIMITED AUTHOR PUBLICATIONS

1. **Kanchan Soni**, Alexander H. Nitz, "Hierarchical searches for subsolar-mass binaries and the third-generation gravitational wave detector era" [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

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" — 2021
  Naxxatra Science, India
- Online invited talk titled "Listening to Cosmic Whispers" (LINK) — 2021
  IISER Thiruvananthapuram, India
- 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
