# SHARAN BANAGIRI

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**CITIZENSHIP** India

**EDUCATION**

*Ph.D,* Physics (Expected April 2021) *2014 - Present*
University of Minnesota

*B.Tech*, Mechanical Engineering *2009 - 2013*
Indian Institute of Technology, Hyderabad

**RESEARCH INTEREST** Astrophysics and cosmology with gravitational waves. Application of Bayesian and statistical methods to astrophysical data.

**RESEARCH EXPERIENCE**

- Unmodeled searches for long duration gravitational-wave transients.
- Methods for detection and parameter estimation of binary neutron star post-merger remnants.
- Methods to use gravitational-wave events as probes of large scale structure and anisotropies of matter distribution in the Universe.
- Development of Bayesian methods to detect anisotropies in the millihertz stochastic gravitational-wave backgrounds with LISA

**PROFESSIONAL EXPERIENCE**

*Graduate Researcher, 2016 through Present*
*Advisor*: Prof. Vuk Mandic, PhD, Professor of Physics; University of Minnesota

**TECHNICAL SKILLS** Python, MATLAB, Mathematica, Bash, C/C++, HTCondor, LaTeX, Git, Linux, vim, emacs

**SERVICE**

- ApJ referee
- LVC internal Burst and CW group reviewer.
- School of physics and astronomy colloquium committee member, *2016-2017*

**AWARDS**

- Hoff Lu Fellowship, University of Minnesota, *2018*
- Doctoral Dissertation Fellowship, University of Minnesota, *2019 - 2020*
- Aneesur Rahman Award, University of Minnesota, *2020*

**TEACHING** *Physics Teaching Assistant :* Teaching assistant for introductory and lower level undergraduate physics course (2014 - 2018)

**PROFESSIONAL MEMBERSHIP** LIGO Scientific Collaboration, American Physical Society, LISA Consortium

**TALKS** (selected)

- *December 2020: Cosmology Seminar, University of Minnesota*, Mapping the gravitational-wave sky with the LISA space mission
- *November 2020: LIGO Seminar at Caltech (remote)*, Astrophysics and cosmology with gravitational waves
- *September 2020: LISA Symposium (remote)*, A Bayesian analysis for the anisotropies in the stochastic gravitational-wave background with LISA
- *December 2019: Texas Symposium on Relativistic Astrophysics, Portsmouth UK*, Measuring angular correlations in the ensemble of binary black-hole mergers
- *October 2019: Cosmology Seminar, University of Minnesota*, Measuring anisotropies of sub-threshold binary black-hole mergers
- June 2019: *IGC@25: Multi-messenger Universe, Penn State*, Gravitational-wave searches for post-merger remnants following GW170817
- *2018: Cosmology Seminar, University of Minnesota*, Gravitational-wave searches for post-merger remnants of GW170817
- *October 2018: Midwest Relativity Conference, WI*, LVC searches for long-lived post-merger remnant of GW1708017
- *September 2018: LVC Meeting*, Bayesian parameter estimation of binary neutron star post-merger signals
- *September 2018: LVC Meeting*, Gravitational-wave searches for long-lived post-merger remnants from GW1708017
- *March 2018: LVC Meeting*, STAMP search for long transient Post-Merger signals from GW170817

**PUBLICATIONS** I am an author or a co-author on 78 papers in total. As a member of the LIGO scientific collaboration, I have been a coauthor on all LVC papers since 2017. A complete list of my publications can be found on INSPIRE-HEP or on the ADS service. Highlighted below are the papers to which I made significant contributions.

1. S. Banagiri, A. Criswell, T. Kuan, V. Mandic, J. D. Romano and S. R. Taylor, Mapping the Gravitational-wave Sky with LISA: A Bayesian Spherical Harmonic Approach, Paper in preparation (an early draft can be found at this link).
2. K. Z. Yang, V. Mandic, C. Scarlata and S. Banagiri, Searching for Cross-Correlation Between Stochastic Gravitational Wave Background and Galaxy Number Counts, Mon. Not. Roy. Astron. Soc. **500**, no.2, 1666-1672 (2021)
3. E. Payne, S. Banagiri, P. Lasky and E. Thrane, Searching for anisotropy in the distribution of binary black hole mergers, Phys. Rev. D **102**, no.10, 102004 (2020)
4. S. Banagiri, V. Mandic, C. Scarlata and K. Z. Yang, Measuring angular N-point correlations of binary black-hole merger gravitational-wave events with hierarchical Bayesian inference, Phys. Rev. D **102**, no.6, 063007 (2020)
5. S. Banagiri, M. W. Coughlin, J. Clark, P. D. Lasky, M. A. Bizouard, C. Talbot, E. Thrane and V. Mandic, Constraining the Gravitational-Wave Afterglow From a Binary Neutron Star Coalescence, Mon. Not. Roy. Astron. Soc. **492**, no.4, 4945-4951 (2020)

6. S. Banagiri, L. Sun, M. W. Coughlin and A. Melatos, Search strategies for long gravitational-wave transients: hidden Markov model tracking and seedless clustering, Phys. Rev. D **100**, no.2, 024034 (2019)
7. B. P. Abbott *et al.*, Search for gravitational waves from a long-lived remnant of the binary neutron star merger GW170817, Astrophys. J. **875**, no.2, 160 (2019)
8. M. Fitz Axen, S. Banagiri, A. Matas, C. Caprini and V. Mandic, Multiwavelength observations of cosmological phase transitions using LISA and Cosmic Explorer, Phys. Rev. D **98**, no.10, 103508 (2018)