

# Nikhil Sarin

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## Education

### **Monash University**

**Ph.D.**, Astrophysics, Feb 2018-April 2021 (expected).

Thesis: “The observational consequences of neutron star post-merger remnants” supervised by Dr. Paul Lasky and Dr. Greg Ashton.

Fields: neutron star mergers, gamma-ray bursts, gravitational waves

**Honours** (1<sup>st</sup> class), Astrophysics, 2017.

Thesis: “Gamma-ray burst afterglows and gravitational waves” supervised by Dr. Paul Lasky and Dr. Letizia Sammut.

**BSc**, Major in Astrophysics and Geology, 2014-2016.

## Teaching

### **School of Physics & Astronomy, Monash University**

Teaching assistant, PHS1031 - Physics for the living world, 2017

Teaching assistant, ASP1011 - Introduction to astronomy, 2017

Teaching assistant, PHS1011 - Classical physics and relativity, 2018

Tutor, ASP2062 - Introduction to astrophysics, 2018

Tutor, ASP2011 - Astronomy, 2019

## Awards and Fellowships

### **Research Training Scheme**

PhD Scholarship, Australian Research Council, 2018-2021

### **Runner-up student talk**

Runner-up student talk at the Astronomical Society of Australia (ASA) meeting, 2018

### **MoCA prize**

Best Honours student in Astrophysics, Monash University, 2017

### **J.L Williams Honours Scholarship**

Honours scholarship, 2017

### **Monash Science future leaders**

Science future leaders program (Emerald Tier), 2015

## Languages and Skills

English, Hindi

Python, L<sup>A</sup>T<sub>E</sub>X, Git, Bash, Fortran, Mathematica, HTML, Stan

## Conferences **LIGO PE F2F, February 2019**

LIGO parameter estimation group meeting to develop LIGO parameter-estimation infrastructure.

## **ANITA meeting, February 2019**

Annual Australian National Institute for Theoretical Astrophysics (ANITA) meeting at Swinburne University.

## **OzGrav retreat, December 2018**

Australian research council centre for excellence for gravitational-wave research (OzGrav) annual retreat at Novotel Vines resort, Perth.

## **ASA meeting, July 2018**

Annual Astronomical Society of Australia meeting at Swinburne University.

## **ANITA meeting, February 2018**

ANITA meeting at University of Western Australia.

## Publications

Listed below are only publications for which I have made significant contributions. I am an author on numerous other publications as a member of the LIGO Scientific Collaboration

### Refereed

**Sarin**, Lasky & Ashton (2019), *X-ray afterglows of short gamma-ray bursts: Magnetar or Fireball?*, ApJ, 872:114

**Sarin**, Lasky, Sammut & Ashton (2018), *X-ray guided gravitational-wave search for binary neutron star merger remnants*, PRD, 98:043011.

Ashton, Hübner, Talbot, Lasky et al. (2019), *Bilby: A user-friendly Bayesian inference library for gravitational-wave astronomy*, ApJS 241:2

**My contribution:** As one of the developers for the Bilby code, my key contributions have been to implement Monte-Carlo Gaussian noise realisations, the reduced-order quadrature likelihood for compact binary coalescences, and unit tests.

**The LIGO-Virgo Scientific Collaboration**, Abbott et al. (2019), *Search for Gravitational Waves from a Long-lived Remnant of the Binary Neutron Star Merger GW170817*. ApJ, 875:2

**My contribution:** I was on the paper writing team, contributing significantly to the writing of the introduction and waveform sections. I contributed to the astrophysical interpretation of the results, and calculated detection thresholds for similar signals with third-generation detectors.

**The LIGO-Virgo Scientific Collaboration**, Abbott et al. (2017), *Search for post-merger grav-*

*itational waves from the remnant of the binary neutron star merger GW170817* ApJL, 851, L16.

**My contribution:** I helped develop the waveform models that were used to set the upper-limit on potential gravitational-wave emission.

## Conference Proceedings

Lasky, P., **Sarin** & Ashton (2019), *Neutron Star Merger Remnants: Braking Indices, Gravitational Waves, and the Equation Of State*. Conference Proceedings of the Xiamen-CUSTIPEN Workshop