

# Soumi De

## CURRICULUM VITAE

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## EDUCATION

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### **PhD Candidate, Department of Physics**

Syracuse University, USA

*Aug 2015 - Jun 2020*

Advisor: Prof. Duncan Brown

### **MSc. (First Class) in Physics**

University of Calcutta, India

*2012 - 2014*

### **BSc. in Physics (First Class Honours), minor: Mathematics and Chemistry**

St. Xavier's College, Kolkata, India

*2009 - 2012*

## HONORS, AWARDS, AND FELLOWSHIPS

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### **Research Excellence Doctoral Funding Fellowship, Syracuse University**

*2019-2020*

- Awarded to 36 graduate students across 16 departments.

### **Inaugural Kathy '73 and Stan '72 Walters Endowed Fund for Science Research,**

*2018*

Syracuse University

- Awarded to 1 candidate across all Science disciplines.

### **Kavli Student Fellow, Kavli Summer Program in Astrophysics, Copenhagen, Denmark**

*2017*

- Granted to 14 graduate students from institutes across the USA and Europe to conduct research projects in astrophysics in collaboration with senior scientists in the program.

### **Princess of Asturias Award for Technical and Scientific Research, as a member of the LIGO Scientific Collaboration**

*2017*

### **Special Breakthrough Prize in Fundamental Physics, as a member of the LIGO Scientific Collaboration**

*2016*

### **Gruber Cosmology Prize, as a member of the LIGO Scientific Collaboration**

*2016*

### **Indian Science Academies' Summer Research Fellow**

*2013*

- Granted to 241 Physics Bachelors and Masters students across India to conduct research projects in their preferred institute.

### **Visiting Students' Programme Research Fellowship**

*2013*

- Granted to 12 Masters students across India to conduct research projects in Astronomy and Astrophysics at IUCAA.

## PUBLICATIONS & PRODUCTS

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### SHORT AUTHOR - REFEREED AND PREPRINTS :

8. Rosa Wallace Everson, Morgan MacLeod, **Soumi De**, Phillip Macias, Enrico Ramirez-Ruiz, *Common Envelope Wind Tunnel: Range of Applicability and Self-Similarity in Realistic Stellar Envelopes*, arXiv:2006.07471 (2020).
7. **Soumi De**, Morgan MacLeod, Rosa Wallace Everson, Andrea Antoni, Ilya Mandel, Enrico Ramirez-Ruiz, *Common Envelope Wind Tunnel: The effects of binary mass ratio and implications for the accretion-driven growth of LIGO binary black holes*, arXiv:1910.13333 (2019), Accepted by Astrophysical Journal.
6. Collin D. Capano, Ingo Tews, Stephanie M. Brown, Ben Margalit, **Soumi De**, Sumit Kumar, Duncan A. Brown, Badri Krishnan, Sanjay Reddy, *GW170817: Stringent constraints on neutron-star radii from multimessenger observations and nuclear theory*, Nat Astron (2020) <https://doi.org/10.1038/s41550-020-1014-6>, arXiv:1908.10352.
5. Michael Forbes, Sukanta Bose, Sanjay Reddy, Dake Zhou, Arunava Mukherjee, **Soumi De**, *Constraining the neutron-matter equation of state with gravitational waves*, Phys. Rev. D, 100, 083010 (2019).
4. **Soumi De**, Christopher M. Biwer, Collin D. Capano, Alexander H. Nitz, Duncan A. Brown, *Posterior samples of the parameters of binary black holes from Advanced LIGO, Virgo's second observing run*, Nature Scientific Data 6, 81 (2019).
3. Christopher M. Biwer, Collin D. Capano, **Soumi De**, Miriam Cabero, Alexander H. Nitz, Duncan A. Brown, Vivien Raymond, *PyCBC Inference: A Python-based parameter estimation toolkit for compact binary coalescence signals*, Publ. Astron. Soc. Pac., 131, 996 (2019).
2. **Soumi De**, Daniel Finstad, James M. Lattimer, Duncan A. Brown, Edo Berger, Christopher M. Biwer, *Tidal Deformabilities and Radii of Neutron Stars from the Observation of GW170817*, Phys. Rev. Lett., 121, 091102 (2018).
1. Daniel Finstad, **Soumi De**, Duncan A. Brown, Edo Berger, Christopher M. Biwer, *Measuring the viewing angle of GW170817 with electromagnetic and gravitational waves*, Astrophys. J. Lett. 860, L2 (2018).

### LIGO SCIENTIFIC COLLABORATION PUBLICATIONS:

Following are the publications that I have contributed to as member of the collaboration from Sep 2015 to Jan 2018

7. B. P. Abbott et al., *GW170817: Observation of gravitational waves from a binary neutron star inspiral*, Phys. Rev. Lett., 119, 161101 (2017).
6. B. P. Abbott et al., *Muti-messenger observations of a binary neutron star merger*, Astrophys. J. Lett., 848, 2 (2017).
5. B. P. Abbott et al., *Binary Black Hole Mergers in the First Advanced LIGO Observing Run*, Phys. Rev. X 6, 041015 (2016).
4. B. P. Abbott et al., *GW151226: Observation of Gravitational Waves from a 22-Solar-Mass Binary Black Hole Coalescence*, Phys. Rev. Lett., 116, 241103 (2016).
3. B. P. Abbott et al., *The Rate of Binary Black Hole Mergers Inferred from Advanced LIGO Observations Surrounding GW150914*, Astrophys. J. Lett. 833, 1 (2016).

2. B. P. Abbott et al., *GW150914: First Results from the Search for Binary Black Hole Coalescence with Advanced LIGO*, Phys. Rev. D 93, 122003 (2016).
1. B. P. Abbott et al., *Observation of Gravitational Waves from a Binary Black Hole Merger*, Phys. Rev. Lett., 116, 061102 (2016).

## PRESENTATIONS

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### INVITED TALKS :

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| <b>Strong Gravity Seminar, Perimeter Institute for Theoretical Physics</b><br>Waterloo, Canada<br><i>Modeling the Common Envelope Inspiral Phase and Formation of LIGO's Binary Black Holes</i>   | Mar 2020 |
| <b>Data Science Seminar, Los Alamos National Laboratory</b><br>Los Alamos, New Mexico, USA<br><i>Characterizing neutron stars and black holes with gravitational-wave data science: Techniques and digital infrastructures</i>                      | Feb 2020 |
| <b>Astrophysics Seminar, Los Alamos National Laboratory</b><br>Los Alamos, New Mexico, USA<br><i>Probing neutron star and black hole binaries in the era of multi-messenger astronomy: From simulations to observations</i>                         | Feb 2020 |
| <b>International Workshop on Gross Properties of Nuclei and Nuclear Excitations</b><br>Hirschegg, Austria<br><i>Tidal deformabilities and radii of neutron stars from multimessenger observations</i>   | Jan 2020 |
| <b>High Energy Phenomena Seminar, Harvard Smithsonian Center for Astrophysics</b><br>Cambridge, Massachusetts, USA<br><i>Constraining the properties and evolution of neutron star and black hole binaries from gravitational-wave observations</i> | Feb 2019 |
| <b>Gravitational Wave Physics and Astronomy Workshop</b><br>College Park, Maryland, USA<br><i>Tidal Deformabilities and Radii of Neutron Stars from the Observation of GW170817</i>   | Dec 2018 |
| <b>Kavli Summer Program in Astrophysics</b><br>Niels Bohr Institute, Copenhagen, Denmark<br><i>Effect of mass ratio on Common Envelope flows</i>  | Aug 2017 |

### CONTRIBUTED TALKS :

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|---|----------|
| <b>American Physical Society April meeting</b><br>Denver, Colorado, USA<br><i>Tidal Deformabilities and Radii of Neutron Stars from the Observation of GW170817</i> | Apr 2019 |
| <b>Conference on Computational Physics</b><br>University of California, Davis, USA<br><i>Parameter Estimation of Compact Binaries using PyCBC Inference</i>         | Aug 2018 |
| <b>Eastern Gravity Meeting, Long Island University</b><br>Brooklyn, USA<br><i>Constraining the nuclear equation of state with GW170817</i>                          | May 2018 |

## PROFESSIONAL DEVELOPMENT

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<b>MESA (Modules for Experiments in Stellar Astrophysics) Summer School</b> University of California, Santa Barbara	Summer School <i>Aug 2019</i>
<b>The New Era of Gravitational-Wave Physics and Astrophysics</b> Kavli Intitute for Theoretical Physics	Summer Program <i>May - Jul 2019</i>
<b>Neutron Star Merger Summer School, Facility for Rare Isotope Beams</b> Michigan State University	Summer School <i>Apr 2018</i>
<b>Astrophysics from a Neutron Star Merger</b> Kavli Intitute for Theoretical Physics	Conference <i>Dec 2017</i>
<b>Kavli Summer Program in Astrophysics</b> Niels Bohr Institute, Copenhagen	Summer Program <i>Jul - Aug 2017</i>
<b>Open Science Grid User School</b> University of Wisconsin, Madison, Computer Sciences Department	Summer School <i>Jul 2016</i>