

# A. SYLVIA BISCOVEANU

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## EDUCATION

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**Massachusetts Institute of Technology, *Cambridge, MA*** Expected: 2023  
Ph.D. in Physics  
Field: Gravitational-wave astrophysics

**The Pennsylvania State University, *State College, PA*** 2013–2017  
B.S. in Physics and B.A. in Spanish GPA: 4.0  
Schreyer Honors Scholar and Paterno Fellow  
Minors in Mathematics and Music Performance (violin and viola)  
*Determining the Mass Composition of Ultra High Energy Cosmic Rays Using the Principle of Shower Universality and Data from the Pierre Auger Observatory*, advisor Miguel Mostafá

## EXPERIENCE

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**Graduate Research Assistant** Sept. 2018–present  
LIGO Laboratory, Massachusetts Institute of Technology *Cambridge, MA*  
Thesis advisor: Salvatore Vitale

**Graduate Teaching Assistant** Jan. 2022  
Department of Physics, Massachusetts Institute of Technology *Cambridge, MA*  
Introduction to Special Relativity

**Associate Investigator** Sept. 2017–present  
OzGrav: The ARC Centre of Excellence for Gravitational-Wave Discovery *Melbourne, VIC*

**Fulbright Postgraduate Fellow** Sept. 2017–June 2018  
Monash University *Clayton, VIC*  
Gravitational-wave data analysis with LIGO  
Advisor: Eric Thrane

**Undergraduate Research Assistant** Jan. 2014–May 2017  
The Pennsylvania State University *State College, PA*  
NASA Space Grant for Women in Science and Engineering Research  
Ultra high-energy cosmic ray mass composition with the Pierre Auger Observatory  
Advisor: Miguel Mostafá

**Summer Undergraduate Research Fellow** June 2016–Sept. 2016  
LIGO Laboratory, The California Institute of Technology *Pasadena, CA*  
Searching for non-tensorial polarizations in the stochastic gravitational-wave background

**Undergraduate Research Assistant** Sept. 2015–Dec. 2015  
Universidad Complutense de Madrid *Madrid, Spain*  
Ultra high-energy cosmic ray mass composition with the Pierre Auger Observatory  
Advisor: Fernando Arqueros

**Summer Undergraduate Research Assistant** June. 2015–Aug. 2015  
Monash University *Clayton, VIC*

**Learning Assistant**

The Pennsylvania State University

Introductory Mechanics (Spring 2014)

Introduction to Quantum Mechanics I (Fall 2016)

Jan. 2014-Dec. 2016

State College, PA

**SELECT PUBLICATIONS**

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1. **A.S. Biscoveanu**, P. Landry, S. Vitale, *Population properties and multimessenger prospects of neutron star-black hole mergers following GWTC-3*, (2022), arXiv:2207.01568
2. **A.S. Biscoveanu**, K. Kremer, E. Thrane, *Constraining white dwarf tides from gravitational waves with LISA*, (2022), arXiv:2206.15390
3. **A.S. Biscoveanu**, T.A. Callister, C.-J. Haster, K.K.Y. Ng, S. Vitale, W.M. Farr, *The binary black hole spin distribution likely broadens with redshift*, ApJL 932 L19 (2022), arXiv:2204.01578
4. S. Vitale, **A.S. Biscoveanu**, and C. Talbot, *The orientations of the binary black holes in GWTC-3*, (2022), arXiv:2204.00968
5. V. Varma, **A.S. Biscoveanu**, T. Islam, F.H. Shaik, C.-J. Haster, M. Isi, W.M. Farr, S.E. Field, S. Vitale, *Evidence of large recoil velocity from a black hole merger signal*, Phys. Rev. Lett. 128, 191102 (2022), arXiv:2201.01302
6. **A.S. Biscoveanu**, C. Talbot, S. Vitale, *The effect of spin mismodeling on gravitational-wave measurements of the binary neutron star mass distribution*, MNRAS 511, 4350 (2022), arXiv:2111.13619
7. R. Abbott et al., *The population of merging compact binaries inferred using gravitational waves through GWTC-3*, (2021), arXiv:2111.03634
8. D. Frostig, **A.S. Biscoveanu** et al., *An Infrared Search for Kilonovae with the WINTER Telescope. I. Binary Neutron Star Mergers*, ApJ 926, 152 (2022), arXiv:2110.01622
9. V. Varma, **A.S. Biscoveanu**, M. Isi, W.M. Farr, S. Vitale, *Hints of spin-orbit resonances in the binary black hole population*, Phys. Rev. Lett. 128, 031101 (2022), arXiv:2107.09693
10. V. Varma, M. Isi, **A.S. Biscoveanu**, W.M. Farr, S. Vitale, *Measuring binary black hole orbital-plane spin orientations*, Phys. Rev. D 105, 024045 (2022), arXiv:2107.09692
11. **A.S. Biscoveanu**, *Characterizing gravitational-wave sources with likelihood reweighting*, Nat. Rev. Phys. 4, 5 (2022), DOI: 10.1038/s42254-021-00404-4
12. C. Talbot, E. Thrane, **A.S. Biscoveanu**, R. Smith, *Inference with finite time series: Observing the gravitational Universe through windows*, Phys. Rev. Research 3, 043049 (2021), arXiv:2106.13785
13. **A.S. Biscoveanu**, M. Isi, V. Varma, S. Vitale, *Measuring the spins of heavy binary black holes*, Phys. Rev. D 104, 103018 (2021), arXiv:2106.06492
14. **A.S. Biscoveanu**, C. Talbot, E. Thrane, R. Smith, *Measuring the primordial gravitational-wave background in the presence of astrophysical foregrounds*, Phys. Rev. Lett. 125, 241101 (2020), arXiv:2009.04418
15. **A.S. Biscoveanu**, M. Isi, S. Vitale, V. Varma, *New spin on LIGO-Virgo binary black holes*, Phys. Rev. Lett. 126, 171103 (2021), arXiv:2007.09156
16. Y. Huang et al., *Statistical and systematic uncertainties in extracting the source properties of neutron star - black hole binaries with gravitational waves*, Phys. Rev. D 103, 083001 (2021), arXiv:2005.11850
17. I. Romero-Shaw, C. Talbot, **A.S. Biscoveanu** et al., *Bayesian inference for compact binary coalescences with BILBY: Validation and application to the first LIGO-Virgo gravitational-wave transient catalogue*, MNRAS 499, 3 (2020), arXiv:2006.00714
18. M. Safarzadeh, **A.S. Biscoveanu**, A. Loeb, *Constraining the delay time distribution of compact binary objects from the stochastic gravitational wave background searches*, ApJ 901, 2 (2020), arXiv:2004.12999
19. **A.S. Biscoveanu**, C.-J. Haster, S. Vitale, J. Davies, *Quantifying the Effect of Power Spectral Density Uncertainty on Gravitational-Wave Parameter Estimation for Compact Binary Sources*,

- Phys. Rev. D 102, 023008 (2020), arXiv:2004.05149
20. V. Varma, M. Isi, **A.S. Biscoveanu**, *Extracting the Gravitational Recoil from Black Hole Merger Signals*, Phys. Rev. Lett. 124, 101104 (2020), arXiv:2002.00296
  21. **A.S. Biscoveanu**, E. Thrane, S. Vitale, *Constraining short gamma-ray burst jet properties with gravitational waves and gamma rays*, ApJ 893, 38 (2020), arXiv:1911.01379
  22. **A.S. Biscoveanu**, S. Vitale, C.-J. Haster, *The reliability of the low-latency estimation of binary neutron star chirp mass*, ApJL 884, L32 (2019), arXiv:1908.03592
  23. G. Ashton et al., *Bilby: A user-friendly Bayesian inference library for gravitational-wave astronomy*, ApJS 241, 27 (2019), arXiv:1811.02042
  24. T.A. Callister, **A.S. Biscoveanu** et al., *Polarization-based Tests of Gravity with the Stochastic Gravitational-Wave Background*, Phys. Rev. X 7, 041058 (2017), arXiv:1704.08373
  25. B. P. Abbott et al., *Upper Limits on the Stochastic Gravitational-Wave Background from Advanced LIGO's First Observing Run*, Phys. Rev. Lett., 118, 121101 (2017), arXiv:1612.02029
  26. B. P. Abbott et al., *Directional limits on persistent gravitational waves from Advanced LIGO's first observing run*, Phys. Rev. Lett., 118, 121102 (2017) arXiv:1612.02030

## SCHOLARSHIPS AND AWARDS

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|   |           |
|---|-----------|
| <b>Charlotte Mateer Obert Named PEO Scholar Award</b>   | 2022      |
| National award recognizing academic excellence and achievement by women in doctoral-level programs                |           |
| <b>Alan H. Barrett Prize</b>  | 2021      |
| Department of Physics award for exceptional research in astrophysics at MIT                                       |           |
| <b>Ragnar and Margaret Naess Award</b>  | 2021      |
| MIT Music and Theater Arts award in recognition of creative accomplishments in music                              |           |
| <b>NSF Graduate Research Fellowship</b>   | 2018–2023 |
| National fellowship for outstanding graduate students in STEM fields  |           |
| <b>MIT Emerson Scholarship</b>  | 2020–2022 |
| To support private lessons for outstanding MIT student musicians  |           |
| <b>Paul And Daisy Soros Fellowship for New Americans</b>  | 2018–2020 |
| National fellowship recognizing the top immigrants and children of immigrants pursuing graduate studies in the US |           |
| <b>Monash University Faculty of Science Young Leader Award</b>  | 2018      |
| Recognized for my work to improve the climate for women in Physics and Astronomy at Monash                        |           |
| <b>Ford Foundation Fellowship Honorable Mention</b>   | 2018      |
| National fellowship aiming to increase the diversity of the nation's college and university faculty               |           |
| <b>Fulbright Postgraduate Scholarship – Australia</b>   | 2017–2018 |
| Fellowship designed to promote international relations through research and teaching exchange                     |           |
| <b>APS LeRoy Apker Award for Undergraduate Research Finalist</b>  | 2017      |
| <b>Student Marshal – Penn State Eberly College of Science</b>   | 2017      |
| <b>Student Marshal – Penn State Department of Spanish, Italian, and Portuguese</b>                                | 2017      |
| Honors the top graduating student in the college or department  |           |
| <b>Channa and Usharani Reddy Mission Award</b>  | 2017      |

Recognizes a graduating Schreyer Scholar who best exemplifies the honors college mission

**Barry Goldwater Scholarship Award** 2016  
**Astronaut Scholarship Foundation Award** 2016

National scholarships for undergraduate excellence in STEM

**John and Elizabeth Holmes Teas Scholarship in Physics** 2016-2017  
**Bert Elsbach Honors Scholarship in Physics** 2015-2016  
**Penn State Provost Award** 2013-2015

Merit scholarships for top students in the Physics department and top incoming freshmen

**Penn State Evan Pugh, President Sparks, and President's Freshman Awards** 2014-2017  
For students in the top 0.5% at Penn State

**NASA Space Grant for Women in Science and Engineering Research** 2013-2014  
Funding award for undergraduate research

## INVITED PRESENTATIONS

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1. Physics and Astrophysics at the eXtreme (PAX-VIII) Panelist, *Cambridge, MA* Aug. 2022
2. Harvard LPPC Seminar, *Cambridge, MA* May 2022
3. UWM CGCA Seminar, *virtual* March 2022
4. IPAM Workshop: Mathematical and Computational Challenges in the Era of GW Astronomy  
Workshop III, *Los Angeles, CA* Nov. 2021  
Tutorial Workshop, *virtual* Sept. 2021
5. Perimeter Institute Strong Gravity Seminar, *virtual* Nov. 2021
6. Gravitational Wave Astronomy Northwest Student Workshop, *virtual* June 2021
7. MIT Kavli Institute Brown Bag Lunch Seminar, *virtual* March 2021
8. Brown University ICERM Workshop, *virtual* Nov. 2020  
Statistical Methods for the Detection, Classification, and Inference of Relativistic Objects
9. Harvard Black Hole Initiative Colloquium, *virtual* Nov. 2020
10. Gravitational-Wave Open Data Workshop #3, *virtual* May 2020
11. TEDxFulbrightCanberra, *Canberra, ACT* May 2018  
"The Cosmic Gravitational-Wave Symphony"
12. Penn State Primordial Universe and Gravity Seminar, *State College, PA* April 2017
13. University of Melbourne Astrophysics Colloquium, *Melbourne, VIC* July 2015

## CONTRIBUTED PRESENTATIONS

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1. **American Physical Society April Meeting**, *New York, NY* April 2022  
Sources of systematic error in gravitational-wave measurements of the binary neutron star mass distribution
2. **14th Edoardo Amaldi Conference on Gravitational Waves**, *virtual* July 2021  
Measuring the spins of heavy binary black holes
3. **European Astronomical Society Meeting**, *virtual* July 2021  
The Multimessenger Discovery Potential of the Wide-Field Infrared Transient Explorer
4. **American Physical Society April Meeting**, *virtual* April 2021  
Simultaneous Measurement of a Cosmological Stochastic Background and an Astrophysical Foreground
5. **237<sup>th</sup> Meeting of the American Astronomical Society**, *virtual* Jan. 2021  
A new spin on LIGO-Virgo binary black holes
6. **235<sup>th</sup> Meeting of the American Astronomical Society**, *Honolulu, HI* Jan. 2020  
The Reliability of the Low-Latency Estimation of Binary Neutron Star Chirp Mass

7. **American Physical Society April Meeting**, Denver, CO April 2019  
Constraining Short Gamma-Ray Burst Jet Properties Using Coincident Gravitational-Wave and Electromagnetic Detections
8. **American Physical Society New England Section Meeting**, *Dartmouth, MA* Nov. 2018  
Constraining the Jet Properties of GRBs with Multimessenger Astronomy
9. **9<sup>th</sup> ACGRG**, *Gingin, WA* Nov. 2017  
Constraining GRB Jet Properties Using Coincident GW/EM Detections
10. **LIGO-Virgo Collaboration Meeting**, *Pasadena, CA* March 2017  
Stochastic Search for Non-GR Polarizations  
Best Data Analysis Poster
11. **American Physical Society April Meeting**, *Salt Lake City, UT* April 2016  
Determining the Mass Composition of Cosmic Rays Using Shower Universality
12. **Pierre Auger Collaboration Meeting**, *Malargüe, Argentina* March 2016  
Elongation Rate Using the El Universal Reconstruction
13. **American Physical Society April Meeting**, *Baltimore, MD* April 2015  
Extending the Measurement of Shower Maximum to the Highest Energies Using Universality and Data from the Surface Detector of the Pierre Auger Observatory
14. **American Physical Society Mid-Atlantic Section Meeting**, *State College, PA* Oct. 2014  
Determining the Particle Identity of Ultra-High Energy Cosmic Rays

## SERVICE AND OUTREACH

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- Student Representative**, LIGO Academic Advisory Committee Sept. 2021–present  
Advocate for early career scientists in the LIGO Collaboration through career development and social programming
- Referee**, ApJ, ApJL, Phys. Rev. Lett., Phys. Rev. D 2020–present
- Research Project Leader**, Warrior-Scholar Project July 2020, 2021, 2022  
Design and lead a gravitational-wave research project for veterans transitioning from active service to an academic setting
- Undergraduate Research Mentor**, MIT LIGO Lab
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| Jonathan Davies, Imperial College London | Summer 2019          |
| Kaylee de Soto, MIT                      | Summer 2020          |
| Claire Williams, Carleton College        | Summer and Fall 2020 |
| Nadia Qutob, Georgia Tech                | Summer 2022          |
- Student organizer**, MIT Kavli Institute Journal Club Sept. 2019–May 2021  
Arrange and introduce weekly speakers to present on new papers and preprints to the MIT Kavli community
- Mentor**, Gravitational-Wave Open Data Workshop May 2020, 2021  
Develop and lead a series of tutorials introducing gravitational-wave data analysis techniques using open data
- Graduate Mentor**, MIT Women in Physics Mentorship Program Sept. 2018- June 2019  
Provide advice and support to a female undergraduate physics student at MIT
- Music Director, Social Chair**, MIT Ribotones June 2019–present  
Organize and perform in local outreach concerts at nursing homes and hospitals throughout the Boston area
- Founding Executive Board Member**, MIT MUSE Project Sept. 2020–Sept. 2021  
Organize a virtual concert series highlighting the works of black musicians and composers