

# Brendan M. O'Connor

PHD STUDENT · THE GEORGE WASHINGTON UNIVERSITY

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## Education

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### The George Washington University

PHD PHYSICS – GPA: 4.0

- Advisor: Dr. Chryssa Kouveliotou; Co-Advisors: Eleonora Troja and Brad Cenko
- Thesis: The Transient Universe: Compact Objects Near and Far
- Graduation planned for Spring 2023

Washington, DC

August 2017 - present

### The George Washington University

MPHIL PHYSICS – GPA: 4.0

Washington, DC

August 2017 - July 2020

### The George Washington University

MS PHYSICS – GPA: 4.0

Washington, DC

August 2017 - February 2020

### Union College

BS PHYSICS – GPA: 3.8 (*summa cum laude*)

- Minor in Astrophysics
- Thesis: Colliding Wind Binaries with Orbital Motion: Line Wind Formulation
- Thesis advisor: Francis Wilkin

Schenectady, NY

August 2013 - June 2017

## Professional Experience

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- 2019 - now **Faculty Assistant**, Department of Astronomy, University of Maryland, College Park  
Advisor: Eleonora Troja
- 2019 - now **Research Assistant**, NASA Goddard Space Flight Center (GSFC) Astrophysics Science Division (ASD)  
Advisors: Eleonora Troja and Brad Cenko
- 2018 - now **Graduate Research Assistant**, Department of Physics, The George Washington University  
Advisor: Chryssa Kouveliotou
- 2016 - 2017 **Undergraduate Thesis Researcher**, Department of Physics and Astronomy, Union College  
Advisor: Francis Wilkin
- 2014 **Undergraduate Summer Researcher**, Department of Astronomy, University of Massachusetts Amherst  
Advisor: Mark Heyer

## Publications

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As of June 25, 2022: I have completed 4 first-author, 3 second-author, and 2 third-author publications. I have authored or co-authored a total of 19 publications which have a total of 237 citations. My h-index is 9. In addition to these refereed publications I have led 16 GCN Circulars and Astronomer's Telegrams.

### FIRST AUTHOR

1. **O'Connor, B.**, Troja, E., Dichiara, S., Beniamini, P., et al. 2022. *A deep survey of short GRB host galaxies over  $z \sim 0 - 2$ : implications for offsets, redshifts, and environments*. MNRAS, In press.
2. **O'Connor, B.**, Göğüş, E., Huppenkothen, D., Kouveliotou, C., et al. 2021. *Identification of an X-Ray Pulsar in the BeXRB System IGR J18219–1347*. ApJ, 927, 139
3. **O'Connor, B.**, Troja, E., Dichiara, S., Chase, E. A., et al. 2021. *A tale of two mergers: constraints on kilonova detection in two short GRBs at  $z \sim 0.5$* . MNRAS, 502, 1279

4. **O'Connor, B.**, Beniamini, P., & Kouveliotou, C. 2020. *Constraints on the circumburst environments of short gamma-ray bursts*. MNRAS, 495, 4782

#### CO-AUTHOR

5. Chase, E. A., **O'Connor, B.**, Fryer, C. L., Troja, E., et al., 2022. *Kilonova Detectability with Wide-field Instruments*. ApJ, 927, 163.
6. Troja, E., **O'Connor, B.**, Ryan, G., Piro, L., et al., 2022. *Accurate flux calibration of GW170817: is the X-ray counterpart on the rise?*. MNRAS, 510, 1902.
7. Bruni, G., **O'Connor, B.**, Matsumoto, T., Troja, E., et al., 2021. *Late-time radio observations of the short GRB 200522A: constraints on the magnetar model*. MNRAS, 505, L41.
8. Troja, E., Fryer, C. L., **O'Connor, B.**, Ryan, G., et al., 2022. *A long gamma-ray burst from a stellar merger in the nearby Universe*. Submitted.
9. Dichiara, S., Troja, E., **O'Connor, B.**, Marshall, F. E., et al., 2020. *Short gamma-ray bursts within 200 Mpc*. MNRAS, 492, 5011.
10. Piro, L., Bruni, G., Troja, E., **O'Connor, B.**, et al., 2021. *The fast radio burst FRB 20201124A in a star-forming region: Constraints to the progenitor and multiwavelength counterparts*. A&A, 656, L15.
11. Dichiara, S., Troja, E., Beniamini, P., **O'Connor, B.**, et al., 2021. *Evidence of Extended Emission in GRB 181123B and Other High-redshift Short GRBs*. ApJL, 911, L28.
12. Becerra, R. L., Troja, E., Watson, A., **O'Connor, B.**, et al., 2022. *Deciphering the unusual stellar progenitor of GRB 210704A*. In preparation.
13. Ricci, R., Troja, E., Bruni, G., Matsumoto, T., Piro, L., **O'Connor, B.**, et al., 2021. *Searching for the radio remnants of short-duration gamma-ray bursts*. MNRAS, 500, 1708.
14. Enoto, T., Ng, M., Hu, C.-P., Güver, T., Jaisawal G. K., **O'Connor, B.**, et al., 2021. *A Month of Monitoring the New Magnetar Swift J1555.2—5402 during an X-Ray Outburst*. ApJL, 920, L4.
15. Troja, E., van Eerten, H., Zhang, B., Ryan, G., Piro, L., Ricci, R., **O'Connor, B.**, et al., 2020. *A thousand days after the merger: Continued X-ray emission from GW170817*. MNRAS, 498, 5643.
16. Dichiara S., Troja E., Lipunov V., Ricci R., et al., 2022. *The early afterglow of GRB 190829A*. MNRAS, 512, 2337.
17. Dichiara, S., Becerra, R. L., Chase, E. A., Troja, E., et al., 2021. *Constraints on the Electromagnetic Counterpart of the Neutron-star-Black-hole Merger GW200115*. ApJL, 923, L32.
18. Gorgone, N. M., Woudt, P. A., Buckley, D., Mukai, K., et al., 2021. *Swift/XRT Deep Galactic Plane Survey Discovery of a New Intermediate Polar Cataclysmic Variable, Swift J183920.1—045350*. ApJ, 923, 243.
19. Champion, D., Cognard, I., Cruces, M., Desvignes, G., et al., 2020. *High-cadence observations and variable spin behaviour of magnetar Swift J1818.0-1607 after its outburst*. MNRAS, 498, 6044.

#### Awards, Fellowships, & Grants

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##### AWARDS

2021 **Berman Award for Excellence in Experimental Physics**, The George Washington University

##### FELLOWSHIPS

2016 **Davenport Research Fellowship**, Union College

2013 **Presidential Scholarship**, Union College

##### ACADEMIC HONOR SOCIETIES

2017 **Phi Beta Kappa**, Union College

2017 **Sigma Xi**, Union College

2016 **Sigma Pi Sigma**, Union College

2016 **The Order of Omega**, Union College

## GRANTS

2022 **Chandra Cycle 23 Award (PI: B. O'Connor)**, Smithsonian Astrophysical Observatory (SAO)

\$ 66,792

### Accepted Proposals

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As of June 25, 2022: I am PI of 8 accepted telescope proposals. I acted as the observer (and Co-I) for another 15 accepted proposals. I was involved in an additional 29 accepted proposals as Co-I (totaling 44 proposals as Co-I).

These proposals have been awarded time on the following telescopes and observatories:

*Swift*, *Fermi*, *NICER*, *NuSTAR*, *Chandra*, *Hubble Space Telescope*, Lowell Discovery Telescope, Gemini, ATCA, VLA, uGMRT, e-MERLIN, EVN

#### As PI:

1. **Gemini-North 2022B**, Identifying the fingerprints of r-process heavy metals in a short GRB – *GN-2022B-Q-*  
Awarded 9.5 hr of Rapid ToO 130
2. **Gemini-South 2022B**, Identifying the fingerprints of r-process heavy metals in a short GRB – *GS-2022B-Q-*  
Awarded 9.5 hr of Rapid ToO 134
3. **Gemini-South 2022B**, Off-axis afterglows from compact binary mergers – Awarded 8.5 hr of *GS-2022B-Q-*  
Rapid ToO 232
4. **Lowell Discovery Telescope 2022B (Co-PI)**, Classically Scheduled Imaging and Spectroscopy of Transients and Their Host Galaxies – Awarded 5 full nights
5. **Gemini-South 2022A**, Identifying the fingerprints of r-process heavy metals in a short GRB – *GS-2022A-Q-*  
Awarded 9.5 hr of Rapid ToO 141
6. **Lowell Discovery Telescope 2022A**, Gamma-ray bursts and their host environments – Awarded 4 half-nights
7. **Chandra Cycle 23 Award**, The collimation and energetics of short GRBs: searching for jet-breaks with *Chandra* – Awarded 80 ks (2 ToOs) \$ 66,792
8. **Gemini-South Director's Discretionary Time**, Probing the unusual long GRB 211227A with Gemini – Awarded 2.1 hr of Rapid ToO *DT-2021B-019*
9. **Swift Target of Opportunity Requests**, Successfully requested 21 *Swift* ToOs of Galactic X-ray sources identified through the *Swift* Deep Galactic Plane Survey

#### As CO-I AND OBSERVER:

1. **Lowell Discovery Telescope 2022B (PI: S. B. Cenko)**, Target of Opportunity Transient Follow-Up with LDT
2. **Lowell Discovery Telescope 2022B (PI: I. Andreoni)**, ToO Observations of Gravitational Wave Counterparts in the Fourth LIGO-Virgo-KAGRA Observing Run
3. **Lowell Discovery Telescope 2022A (PI: A. Gottlieb)**, LDT observations of Fast Radio Bursts: counterparts and environment
4. **Lowell Discovery Telescope 2022A (PI: Cenko)**, Target of Opportunity Gamma-Ray Burst Follow-Up with LDT
5. **NICER Cycle 4 (PI: C. Kouveliotou)**, *NICER* ToO observations of *Swift*/XRT Deep Galactic Plane Survey (DGPS) sources
6. **Chandra Cycle 23 (PI: C. Kouveliotou)**, *Chandra* ToO observations of Phase II *Swift* Deep Galactic Plane Survey (DGPS) sources
7. **Lowell Discovery Telescope 2021B (PI: Cenko)**, Target of Opportunity Gamma-Ray Burst Follow-Up with LDT
8. **Lowell Discovery Telescope 2021B (PI: S. Dichiara)**, Gamma-ray bursts and their host environments
9. **Lowell Discovery Telescope 2021B (PI: E. Troja)**, LDT observations of Fast Radio Bursts: counterparts and environment

10. **Chandra Director's Discretionary Time (PI: E. Troja)**, A luminous kilonova or a faint supernova? The curious case of GRB210704A
11. **Chandra Director's Discretionary Time (PI: L. Piro)**, Unraveling the nature of the persistent radio source associated to FRB201124A with *Chandra*
12. **Lowell Discovery Telescope 2021A (PI: S. Dichiara)**, Gamma-ray bursts and their host environments
13. **Lowell Discovery Telescope 2021A (PI: E. Troja)**, LDT observations of Fast Radio Bursts: counterparts and environment
14. **NICER Cycle 3 (PI: C. Kouveliotou)**, *NICER* ToO observations of *Swift*/XRT Deep Galactic Plane Survey (DGPS) sources
15. **NuSTAR Director's Discretionary Time (PI: C. Kouveliotou)**, *Swift* Galactic Plane Survey Key Project – Utilized 9 *NuSTAR* DDTs of Galactic X-ray sources identified through the *Swift* Deep Galactic Plane Survey. The Survey was a *NuSTAR* Legacy Survey Program until 2019.

#### ADDITIONAL CO-I PROPOSALS:

1. **HST Cycle 30 (PI: E. Troja)**, Mapping the diversity of kilonovae through rapid Hubble observations of a short gamma-ray burst GO-17175
2. **HST Cycle 29 (PI: E. Troja)**, Identifying the fingerprints of r-process heavy metals in a short GRB GO-16846
3. **HST Cycle 25 (PI: E. Troja)**, Identify the signature of neutron star mergers through rapid Hubble observations of a short GRB GO-15089
4. **Gemini-North 2022B (PI: M. Im)**, Long-term Monitoring in Optical/NIR of Gravitational-wave Sources GN-2022B-Q-117
5. **Gemini-South 2022B (PI: M. Im)**, Long-term Monitoring in Optical/NIR of Gravitational-wave Sources GS-2022B-Q-120
6. **Gemini-North 2022B (PI: M. Im)**, Optical/NIR Follow-up Observation of Gravitational-Wave Sources GN-2022B-Q-118
7. **Gemini-South 2022B (PI: M. Im)**, Optical/NIR Follow-up Observation of Gravitational-Wave Sources GS-2022B-Q-119
8. **Gemini-South 2021A (PI: E. Troja)**, Mapping the diversity of neutron star mergers with rapid Gemini observations of short gamma-ray bursts GS-2021A-Q-102
9. **Gemini-North 2021A (PI: E. Troja)**, Mapping the diversity of neutron star mergers with rapid Gemini observations of short gamma-ray bursts GN-2021A-Q-103
10. **Gemini-North 2020B (PI: E. Troja)**, Mapping the diversity of neutron star mergers with rapid Gemini observations of short gamma-ray bursts GN-2020B-Q-102
11. **Gemini-South 2020B (PI: E. Troja)**, Mapping the diversity of neutron star mergers with rapid Gemini observations of short gamma-ray bursts GS-2020B-Q-101
12. **Fermi Cycle 14 (PI: C. Kouveliotou)**, Magnetar Observations with the Fermi/Gamma Ray Burst Monitor
13. **Chandra Cycle 23 (PI: E. Troja)**, Beyond the GRB jet: searching for the remnant of a neutron star merger
14. **Chandra Cycle 23 (PI: E. Troja)**, Identifying the fingerprints of r-process heavy metals in a short GRB
15. **Chandra Cycle 23 (PI: S. Dichiara)**, Chandra Sub-arcsecond Localization of Swift Short GRBs
16. **Chandra Cycle 22 (PI: E. Troja)**, The Collimation and Energetics of Short GRBs: Searching for Jet-breaks with Chandra
17. **Swift Cycle 18 (PI: S. Dichiara)**, Searching High and Low for Elusive Short GRBs
18. **EVN E21 (PI: G. Bruni)**, Characterising the progenitors of fast radio bursts with the EVN EB094
19. **EVN DDT (PI: F. Panessa)**, Disclosing the nature of the persistent radio source associated to FRB20201124A

20. **e-MERLIN Cycle 13 (PI: G. Bruni)**, Characterising the progenitors of fast radio bursts with e-MERLIN
21. **e-MERLIN DDT (PI: G. Bruni)**, Disclosing the nature of the persistent radio source associated to FRB 20201124A with e-MERLIN
22. **ATCA 2022 (PI: R. Ricci)**, Characterizing the spectral behaviour of the Persistent Radio Emission of a Fast Radio Burst
23. **GMRT Cycle 42 (PI: G. Bruni)**, Spectral characterization of the persistent radio emission in fast radio bursts
24. **GMRT DDT (PI: G. Bruni)**, Characterising starburst activity in the host of the repeating FRB 20201124A
25. **VLA 2022B (PI: E. Troja)**, The collimation and energetics of short gamma-ray bursts
26. **VLA 2022B (PI: S. Chastain)**, Electromagnetic counterparts of gravitational wave events
27. **VLA 2021B (PI: E. Troja)**, The collimation and energetics of short gamma-ray bursts
28. **VLA 2021B (PI: E. Troja)**, Beyond the GRB jet: searching for the remnant of a neutron star merger
29. **VLA 2021A (PI E. Troja)**, Beyond the GRB jet: searching for the remnant of a neutron star merger

## Presentations

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### INVITED TALKS

- May 2022. *Shedding light on hostless short GRBs with large aperture telescopes*. Invited talk (45m) at Transient Astronomy Meeting (TAM). University of Maryland, College Park. Presented virtually.
- April 2022. *Shedding light on hostless short GRBs with large aperture telescopes*. Invited talk (45m) at Astronomy Group Meeting. The George Washington University. Washington, DC.
- March 2022. *Shedding light on hostless short GRBs with large aperture telescopes*. Invited talk (45m) at High Energy Astrophysics (HEAP) seminar. Universidad Nacional Autónoma de México. Presented virtually.

### CONTRIBUTED PRESENTATIONS

- March 2022. *A search for hostless short GRBs with large aperture telescopes*. Poster presentation at High Energy Astrophysics Division (HEAD 19) Meeting. Pittsburgh, PA.
- December 2021. *Shedding light on hostless short GRBs with large aperture telescopes*. Contributed talk (20m) at IAU Symposium 363. Presented virtually.
- June 2021. *Constraints on kilonova emission in two short GRBs at  $z \sim 0.5$* . Contributed talk (15m) at Marcel Grossman 16th Meeting. Presented virtually.
- June 2021. *Constraints on kilonova emission in two short GRBs at  $z \sim 0.5$* . Contributed talk (15m) at European Astronomical Society (EAS) Annual Meeting. Presented virtually.
- March 2021. *Constraints on kilonova emission in two short GRBs at  $z \sim 0.5$* . Contributed talk at 2021 Square Kilometer Array (SKA) Science Conference. Presented virtually.
- January 2021. *Constraints on kilonova emission in two short GRBs at  $z \sim 0.5$* . Contributed talk (5m) at the virtual 237th meeting of the American Astronomical Society (AAS). Presented virtually.
- October 2020. *The merger environments of short gamma-ray bursts*. Contributed talk (15m) at Chandra Frontiers in Time Domain Astrophysics. Presented virtually.
- April 2019. *Revealing Trending YouTube Videos and their Relation to Power Laws*. Poster presentation at The George Washington University Research Days (second prize in the area of Studies in Business, Politics, and Society). Washington, DC.

May 2017. *Binary Stellar Wind Collisions with Orbital Motion*. Poster presentation at Annual Union College Steinmetz Symposium. Schenectady, NY.

April 2017. *Colliding Wind Binaries with Orbital Motion: Line Wind Formulation*. Poster presentation at National Conference on Undergraduate Research (NCUR). Memphis, TN.

October 2016. *Colliding Wind Binaries with Orbital Motion: 2D Line Wind Formulation in the Corotating Frame*. Poster presentation at Astronomical Society of New York (ASNY) Monference. Albany, NY.

## Teaching Experience

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- 2019 **Secondary Instructor**, The George Washington University  
2017-2019 **Graduate Teaching Assistant**, The George Washington University

## Mentoring Experience

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- 2022 **Supervised the research of a first-year graduate student**, Seth Gagnon, The George Washington University  
2021 **Supervised the research of a first-year graduate student**, Alex van Kooten, The George Washington University

## Outreach & Professional Development

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### SERVICE AND OUTREACH

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|--------------------|---|-----------------|
| 2018 & 2019        | <b>Astronomy Festival on the National Mall</b> , Volunteer                                  | Washington, DC  |
| 2016-2017          | <b>Union College Student Affairs Council</b> , Student Representative                       | Schenectady, NY |
| 2016-2017          | <b>Union College Student Conduct Committee</b> , Committee Member                           | Schenectady, NY |
| 2016 & 2017        | <b>Dudley Observatory at Museum of Innovation and Science</b> , Volunteer at Astronomy Days | Schenectady, NY |
| 2015-2016          | <b>Union College Men's Club Soccer</b> , Treasurer  | Schenectady, NY |
| 2015 & 2016        | <b>Special Olympics New York Annual 5k rUndead Event Service</b> , Volunteer                | Schenectady, NY |
| 2014, 2015, & 2016 | <b>John Calvin Toll Day of Community Service</b> , Volunteer                                | Schenectady, NY |
| 2015               | <b>Town of Niskayuna Recreational Soccer</b> , Volunteer Coach                              | Niskayuna, NY   |
| 2014               | <b>Food Bank of Western Massachusetts</b> , Volunteer                                       | Hatfield, MA    |

### PEER REVIEW

- 2022 - now **Journal referee**, The Astrophysical Journal (ApJ)

### PROFESSIONAL MEMBERSHIPS

- 2020 - now **Swift Deep Galactic Plane Survey (SGPS)**, Observation Lead  
2020 - now **The Gamow Explorer Science Team**, Member  
2020 - now **MeerKAT Galactic Plane Survey**, Member

### WEEKLY COLLOQUIA

- 2022 - now **GWU Astronomy Data Analysis Seminars**, Organizer/Presenter  
2022 - now **UMD Transient Astronomy Meetings**, Member/Presenter  
2019 - now **NASA GSFC GRB Lunch**, Member/Presenter  
2018 - now **GWU Astronomy Group Meetings**, Member/Presenter