



Andrew Miller

◆ Nationality: American and Irish ◆ Date & Place of Birth: 7 January 1993, New Jersey, USA

FELLOWSHIPS/APPOINTMENTS:

5. Postdoctoral Fellow, Université Catholique de Louvain, Louvain-la-Neuve, Belgium, January 2020–present
4. Fellow, [Institute for High Energy Physics and Astrophysics](#) (IHEPA), University of Florida, USA, August 2019–December 2019
3. Early Career Researcher, Institute for Cosmic Ray Research (ICRR), Japan, [RISE-NEWS](#) program trilateral collaboration between US, Europe and Japan, August 2019–November 2019.
2. Graduate Research Fellow, University of Florida, USA, August 2015–August 2019.
1. Merit scholar, The College of New Jersey, USA, August 2011–May 2015.

EDUCATION:

Sapienza-Università di Roma, Dipartimento di fisica, Roma, Italy, 2016–2019 & University of Florida (UF), Department of physics, Gainesville, FL, USA, 2015–2019

Dual doctorate in physics

University of Florida, 2015–2016

Master of Science in physics, 20 December 2016

The College of New Jersey (TCNJ), Department of Physics, Ewing, NJ, 2011–2015

Bachelor of Science in physics, 22 May 2015, minor in mathematics, summa cum laude

PUBLICATIONS:

16. D. Chatterjee, S. Ghosh, P. Brady, S. Kapadia, A. Miller, S. Nissanke, F. Pannarale (2019). A Machine Learning Based Source Property Inference for Compact Binary Mergers. Accepted, ApJ.
15. O. Piccinni, P. Astone, S. D'Antonio, S. Frasca, G. Intini, I. LaRosa, P. Leaci, S. Mastrogiovanni, A. Miller, C. Palomba (2019). A directed search of continuous gravitational wave signals from the Galactic center in Advanced LIGO second observing run. Accepted, PRD.
14. Palomba, C., D'Antonio, S., Astone, P., Frasca, S., Intini, G., La Rosa, I., Leaci, P., Mastrogiovanni, S., Miller, A.L., Muciaccia, F. and Piccinni, O.J. (2019). Direct constraints on ultra-light boson mass from searches for continuous gravitational waves. Physical Review Letters 123, 17.
13. Miller, A.L., Astone, P., D'Antonio, S., Frasca, S., Intini, G., La Rosa, I., Leaci, P., Mastrogiovanni, S., Muciaccia, F., Mitidis, A. and Palomba, C. (2019). How effective is machine learning to detect long transient gravitational waves from neutron stars in a real search? Physical Review D, 100(6), p.062005.

12. Singhal, A., P. Astone, S. D'Antonio, S. Frasca, G. Intini, P. Leaci, S. Mastrogiovanni, A. Miller, C. Palomba, and O. J. Piccinni (2019). A resampling algorithm to detect continuous-wave signals from neutron stars in binary systems. *Classical and Quantum Gravity* 36, 205015.
11. Oliver, M., Keitel, D., Miller, A. L., Estelles, H., & Sintes, A. M. (2019). Matched-filter study and energy budget suggest no detectable gravitational-wave 'extended emission' from GW170817. *Monthly Notices of the Royal Astronomical Society*, 485(1), 843-850.
10. Mytidis, A., Panagopoulos, A. A., Panagopoulos, O. P., Miller, A. and Whiting, B.F. (2019). Sensitivity study using machine learning algorithms on simulated r-mode gravitational wave signals from newborn neutron stars. *Physical Review D* 99.2: 024024.
9. LVC Collaboration: Search for gravitational waves from a long-lived remnant of the binary neutron star merger GW170817 (2019). *The Astrophysical Journal* 875, no. 2: 160.
8. D'Antonio, S., Palomba, C., Astone, P., Frasca, S., Intini, G., La Rosa, I., Leaci, P., Mastrogiovanni, S., Miller, A., Muciaccia, F. and Piccinni, O.J. (2018). Semicoherent analysis method to search for continuous gravitational waves emitted by ultralight boson clouds around spinning black holes. *Physical Review D*, 98(10), p.103017.
7. Mastrogiovanni, S., Astone, P., Antonio, S.D., Frasca, S., Intini, G., La Rosa, I., Leaci, P., Miller, A., Muciaccia, F., Palomba, C. Piccinni, O.J., and A. Singhal (2018). Phase decomposition of the template metric for continuous gravitational-wave searches. *Physical Review D* 98.10: 102003
6. Miller, A., P. Astone, S. D'Antonio, S. Frasca, G. Intini, P. Leaci, S. Mastrogiovanni, C. Palomba, O. J. Piccinni, A. Singhal and B.F. Whiting (2018). Method to search for long duration gravitational wave transients from isolated neutron stars using the generalized frequency-Hough transform. *Physical Review D* 98.10: 102004.
5. Piccinni, O. J., P. Astone, S. D'Antonio, S. Frasca, G. Intini, P. Leaci, S. Mastrogiovanni, A. Miller, C. Palomba, and A. Singhal (2018). A new data analysis framework for the search of continuous gravitational wave signals. *Class.Quantum Grav* 36(1), no. 015008.
4. Mastrogiovanni, S., P. Astone, S. D'Antonio, S. Frasca, G. Intini, P. Leaci, A. Miller, C. Palomba, O. J. Piccinni, and A. Singhal (2017). An improved algorithm for narrow-band searches of continuous gravitational waves. *Class. Quantum Grav* 34, no. 135007.
3. Walsh, S., Pitkin, M., Oliver, M., D'Antonio, S., Dergachev, V., Krolak, A., Miller, A., ... & Frasca, S. (2016). Comparison of methods for the detection of gravitational waves from unknown neutron stars. *Physical Review D*, 94(12), 124010.
2. Miller, A. and Wickramasinghe, T. (2016): How beaming of gravitational radiation from gamma ray bursts impacts gravitational wave detection. *Journal of Physics: Conference Series* 716, pp. 12006-12009(4). doi:10.1088/1742-6596/716/1/012006.
1. Magee, N. B., Miller, A., Amaral, M., and Cumiskey, A (2014): Mesoscopic surface roughness of ice crystals pervasive across a wide range of ice crystal conditions, *Atmos. Chem. Phys.*, **14**, 12357-12371, doi:10.5194/acp-14-12357-2014.

TEACHING EXPERIENCE:

4. *Teaching Assistant*, Department of Physics, University of Florida, Aug. 2015–Dec. 2016
Taught 3 classical mechanics labs, fall 2015, 4 mechanics discussion sections, spring/fall 2016.
3. *Physics Tutor*, Department of Physics, The College of New Jersey, Aug. 2014–May 2015
Tutored General Physics I, II, Modern Physics, and Mathematical Physics.
2. *Physics and Math Tutor*, Tutoring Center, The College of New Jersey, Aug. 2013–May 2014
Tutored General Physics I and II, Calculus A and B, and Differential Equations.
1. *Lab Assistant*, Department of Physics, The College of New Jersey, Aug. 2012–May 2013
Set up and assisted with General Physics I and II labs.

CONFERENCE ORGANIZING EXPERIENCE:

3. On the Organizing Staff for the 1st European Physical Society Conference on Gravitation, 19–21 February 2019, Rome, Italy.
2. On the Organizing Staff for the IAU General Assembly, 20–31 August 2018, Vienna, Austria.
1. On the Organizing Staff for the 15th Marcel Grossmann Meeting, 1–7 July 2018, Rome, Italy.

INVITED PRESENTATIONS:

6. Miller, A., Bruno, G., Astone, P. et al. Adapting gravitational wave searches to detect dark photon dark matter. Presented to the University of Maastricht, 27 February 2020, Maastricht, Netherlands.
5. Miller, A., Astone, P. et al. Transient continuous gravitational wave searches using machine learning and the Hough Transform. Presented to the University of Liège, 20 February 2020, Liège, Belgium.
4. Miller, A., Astone, P. et al. Using machine learning and the Hough Transform to detect gravitational waves from isolated neutron stars. Presented to the Université Catholique de Louvain, 9 January 2020, Louvain-la-Neuve, Belgium.
3. Miller, A., Astone, P. et al. Characterizing machine learning's capabilities to detect long duration transient gravitational wave signals from isolated neutron stars. Presented to the Congrès des doctorants (conference of Ph.D. students), 25–29 March 2019, Paris, France.
2. Miller, A. for the LIGO/Virgo collaborations. Results of a Search for a Postmerger Remnant of Binary Neutron Merger GW170817. Presented to the 1st Punjab University (PU) International Conference on Gravitation and Cosmology, 27–31 January 2019, Lahore, Pakistan.
1. Miller, A., Astone, P. et al. Searching for a remnant of GW170817. Presented to the University of Oslo, Institute of Theoretical Astrophysics, 14 June 2018, Oslo, Norway.

COLLABORATION MEETING PRESENTATIONS:

7. Miller, A. and the Rome/Florida groups. Long duration transient search on O3 data using machine learning and the Generalized FrequencyHough. Presented remotely to the LSC-Virgo March Meeting, Lake Geneva, WI, USA, 18–21 March 2019.
6. Miller, A. and the Rome/Florida groups. Update on FrequencyHough postmerger search. Presented to the LSC-Virgo September Meeting, Maastricht, Netherlands, 4–7 September 2018.
5. Miller, A. and the Rome/Florida groups. Update on postmerger remnant search using the FrequencyHough. Presented to the April Virgo Week meeting, Cascina, Italy, 16–18 April 2018.
4. Miller, A. and the Rome/Florida groups. FrequencyHough postmerger search update. Presented remotely to the LSC-Virgo March Meeting, Sonoma, USA, 19–22 March 2018.
3. Miller, A. and the Rome/Florida groups. Post-merger remnant search for long GW transients. Presented to the November Virgo Week meeting, Cascina, Italy, 6–8 November 2017.
2. Miller, A., Astone, P. and Whiting, B.F. Analyzing a machine learning algorithm to detect gravitational waves from r-modes in white noise. Presented to the LSC-Virgo September Meeting, Geneva, Switzerland, 28 August–1 September, 2017.
1. Miller, A. et al. Developing a machine learning-based method to detect long gravitational wave transients. Presented to the May Virgo Week meeting, Cascina, Italy, 15–17 May 2017.

CONFERENCE PRESENTATIONS:

17. Miller A. et al. First search for a remnant of GW170817 using convolutional neural networks. Presented to the TeV Particle Astrophysics conference (TeVPA 2019), 2–6 December 2019, Sydney, Australia.
16. Miller, A. et al. First search for a remnant of GW170817 using convolutional neural networks. Presented to the Gravitational Wave Physics and Astronomy Workshop (GWPAW), 14–17 October, 2019, Tokyo, Japan.
15. Miller, A. for the Rome and Florida groups. Using machine learning to detect gravitational waves from isolated neutron stars. Presented to the 10th Young Researcher Meeting (YRM), 18–21 June, 2019, Rome, Italy.
14. Miller, A., Astone, P. and Whiting, B. A method to search for a remnant of GW170817 with the FrequencyHough. Presented to the 3rd HEL.A.S. summer school and DAAD school “neutron stars and gravitational waves, 8–12 October 2018, Thessaloniki, Greece.
13. Miller, A. Astone, P. and Whiting, B. for the Rome /Florida groups. Searching for a remnant of GW170817. Presented to the ISAPP-Baikal Summer School "Exploring the Universe through multiple messengers", 12–21 July 2018, Bol'shie Koty, Russia.
12. Miller, A. for the Rome and Florida groups. A method to search for a remnant of GW170817 with the FrequencyHough. Presented to the GEMMA (Gravitational-waves, ElectroMagnetic and dark MAtter) workshop, 4–7 June 2018, Lecce, Italy.

11. Sintes, A. for the LIGO/Virgo collaborations. Searches for signals from unknown or poorly known sources. Presented to the Astro-Solids, Dense Matter, and Gravitational Waves workshop, 16–20 April 2018, Seattle, WA, USA.
10. Miller, A. for the Rome and Florida groups. Search for a remnant of GW170817 using the Hough transform. Presented to the YKIS2018a symposium: General Relativity –The Next Generation, 19–23 February 2018, Kyoto, Japan.
9. Miller, A., Astone, P. Palomba, C. and Whiting, B.F. Post-merger remnant search for long gravitational wave transients. Presented to the 29th International Texas Symposium on Relativistic Astrophysics, Cape Town, South Africa, 3–8 December, 2017.
8. Palomba, C. and Miller, A. Search for very long transient GW signals from the post-merger Remnant of BNS. Presented to the GW170817 - Italian contributions to the dawn of the multi-messenger astronomy, Gran Sasso Science Institute (GSSI), L'Aquila, Italy, 29 November–1 December, 2017.
7. Miller, A., Vajpeyi, A., Astone, P., Frasca, S. and Whiting, B.F. Using Filtering to Find Long Duration Gravitational Waves from Neutron Stars. Presented to the 2017 IEEE International Young Scientists Forum on Applied Physics & Engineering, Lviv, Ukraine, 17–20 October, 2017.
6. Miller, A. and Wickramasinghe, T. How beaming of gravitational radiation from gamma ray bursts impacts gravitational wave detection. Presented to the 11th Edoardo Amaldi Conference on Gravitational Waves, Gwangju, South Korea, 21–26 June, 2015.
5. Miller, A. and Astone, P. An analysis of the FrequencyHough method for an all-sky search for continuous gravitational waves. Presented to the American Physical Society April Meeting as a talk, Baltimore, MD, 11–14 April, 2015.
4. Miller, A. and Zender, C.S. How much do diurnal land-sea circulations contribute to coastal wind power? Presented to the American Geophysical Union (AGU) Fall Meeting, San Francisco, CA, 9–13 December, 2013.
3. Miller, A. and Zender, C.S. Contribution of the diurnal sea breeze to wind power potential at Crystal Cove. Presented to the Society for Advancement of Chicanos and Native Americans in Science National Conference, San Antonio, TX, 3–6 October, 2013.
2. Miller, A., N. Magee, and M. Amaral: Nanoscale ice measured through in-situ ellipsometry and ESEM. Presented to the (AGU) Fall Meeting, San Francisco, CA, 3–7 December, 2012.
1. Amaral, M., Magee, N. and Miller, A. Environmental scanning electron microscopy of ice crystal nucleation and growth: investigating the formation of a shadow behind nucleating ice crystals. Presented to the AGU Fall Meeting, San Francisco, CA, 3–7 December, 2012.

SCHOOLS AND OTHER MEETINGS ATTENDED:

6. Physical and Mathematical Aspects of General Relativity, 15–19 July, 2019, Domodossola, Italy.
5. The International School on Gravity from Earth to Space, 21–23 May, 2019, Urbino, Italy.

4. Third ASTERICS-OBELICS International School on Computing for Astrophysics and Astroparticle Physics, 8–12 April, 2019, Annecy, France.
3. Fundamental Physics with LISA, 12–14 November, 2018, Arcetri, Florence, Italy.
2. Third LISA Consortium meeting, 5–7 November, 2018, Marseilles, France.
1. International School of Physics "Enrico Fermi", Gravitational Waves and Cosmology, 3–12 July, 2017 Varenna, Lake Como, Italy.

UNDERGRADUATE RESEARCH SUPERVISION:

3. Teresita Ramirez, International Research Experience for Undergraduates (IREU) student from California State University, Fullerton, CA, USA, Parameter estimation of power-law gravitational wave signals using machine learning, May–August 2019.
2. Jessica Leviton, IREU student from University of Michigan, MI, USA, Inaccuracies in Correction Parameters and Long Duration Transient Source Recovery, May–August 2018.
1. Avi Vajpeyi, IREU student from The College of Wooster, OH, USA, Enhancing Long Transient Power Spectra with Filters, May–August 2017.

OUTREACH:

3. *Graduate Student Mentor*, University of Florida IREU, November 2016–August 2019
Mentor American undergraduates who travel to Europe to do research for 2 months each summer.
2. *Gravitational waves: Theory, Detection, and Prospects*. Presented to The College of New Jersey, 3 May 2016. Presentation to my alma mater to get students interested in gravitational waves.
1. *An overview of gravitational wave physics: experiments and data analysis techniques*. Presented to the Pascack Hills High School Research Symposium, 22 May 2015
Invited presentation to my high school to get students interested in gravitational waves.

AWARDS:

4. Institute of High Energy Physics (IHEPA) Award, August 2019–present
3. 2nd place for presentation in Multiwavelength Astronomy and Astrophysics Section at the Young Scientists Forum in Lviv, Ukraine, 20 October 2017.
2. Fink-Moses-Pregger Physics Award for highest grade point average (GPA), 22 May 2015.
1. Leadership and services award in The College of New Jersey physics department, 22 May 2015.