

# BRIAN A. CLARK

## CONTACT

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## RESEARCH INTERESTS

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Ultra-high energy neutrino astrophysics; hardware and circuit design for RF signal conditioning; mechanical/electrical systems integration; machine learning in astrophysics.

## EDUCATION

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**The Ohio State University**, Columbus, Ohio USA 2014-2019 (Expected)  
Ph.D. in Physics–Advisor: Prof. Amy Connolly  
Master of Science in Physics, June 2016

**Washington University in St. Louis**, St. Louis, Missouri USA 2010-2014  
Bachelor of Arts in Physics, *Cum Laude*–Advisor: Prof. Henric Krawczynski

## AWARDS

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National Science Foundation Graduate Research Fellowship 2016-2019  
APS Division of Astrophysics Travel Award 2017  
OSU Graduate Enrichment Fellowship 2014-2015  
WUSTL Undergraduate Physics Research Fellow Summer 2011

## EXPERIENCE

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**The Ohio State University**, Columbus, OH USA **August 2014 - present**  
*Ph.D. Student*, Ultra-High Energy Neutrino Astrophysics

- Active developer in the simulation, hardware, and analysis efforts in Askaryan Radio Array (ARA) collaboration to detect ultra-high energy, extra-galactic neutrinos.
- Lead and directed the mechanical and electrical systems integration of three new neutrino detecting stations, including the management of a six person team of junior students.
- Built and tested printed circuit boards for megahertz RF signal conditioning and power distribution, monitoring, and control.
- Deployed to Antarctica for five weeks to lead the commissioning and calibration of five neutrino detecting stations; performed rapid, high quality on site assessment of instrument performance.
- Developed new frequency and time-series analysis techniques to analyze radio emission from solar flares in the ARA prototype; this is the first extraterrestrial emission observed by the array.

## PUBLICATIONS

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1. “Observation of Reconstructable Radio Emission Coincident with an X-Class Solar Flare in the Askaryan Radio Array Prototype Station.”  
P. Allison et. al. for the ARA Collaboration (incl. **B. A. Clark** as corresponding author)  
To Be Submitted to Journal of Astroparticle Physics (2018).

2. “Measurement of the real dielectric permittivity  $\epsilon_r$  of glacial ice.”  
P. Allison et. al. for the ARA Collaboration (incl. **B. A. Clark**)  
Submitted to the Journal of Glaciology (2017). [arXiv:1712.03301]
3. “Analyzing the Data from X-ray Polarimeters with Stokes Paramters.”  
F. Kislat, **B. Clark**, M. Bielicke, H. Krawczynski.  
Astroparticle Physics Vol 68 Pg 45-51 (2015). [arXiv:1409.6214]

## SCIENTIFIC TALKS (1 Invited, 8 Contributed)

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| 1. Talk, OSU Physics Summer Seminar Series, Columbus OH.<br><i>Ultra-High Energy Neutrino Astrophysics with Radio-Based Detectors.</i>  | 2018/06/26 |
| 2. Talk, OSU CCAPP Seminar, Columbus OH.<br><i>The Askaryan Radio Array: Detector Status and Prospects for Using Directional Reconstruction in Point-Source Searches.</i>           | 2018/05/22 |
| 3. Talk, APS April Meeting 2018, Columbus OH.<br><i>Directional Reconstruction as a Means of Lowering Thresholds for Point-Source Searches in the Askaryan Radio Array.</i>         | 2018/04/16 |
| 4. Talk, TeVPA 2017, Columbus OH.<br><i>The Askaryan Radio Array: Current Status and Future Plans.</i>  | 2017/08/11 |
| 5. Talk, APS April Meeting 2017, Washington DC.<br><i>Observation of Reconstructable Radio Waveforms from Solar Flares with Askaryan Radio Array.</i>                               | 2017/01/31 |
| 6. Invited Talk, College of Wooster Physics Department Colloquium, Wooster OH.<br><i>Ultra-High Energy Neutrino Astrophysics with Radio Detectors.</i>                              | 2016/10/04 |
| 7. Talk, Computing in High Energy Astropart. Phys. Research 2016, Columbus OH.<br><i>Machine Learning Prospects in Trigger Thresholds for High Energy Radio Neutrino Astronomy.</i> | 2016/05/26 |
| 8. Talk, OSU Physics Summer Seminar Series, Columbus OH.<br><i>Trigger Thresholds in High Energy Neutrino Astronomy.</i>  | 2016/04/23 |
| 9. Talk, Ohio Section of the APS Spring 2016 Meeting, Dayton OH.<br><i>Ultra-High Energy Neutrino Astrophysics with the Askaryan Radio Array (ARA).</i>                             | 2016/04/09 |

## TEACHING

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TA Training Facilitator, University Center for the Advancement of Teaching, OSU	August 2016
Teaching Assistant, “Astronomy 1143: Stars, Galaxies, and Cosmology, OSU	Spring 2016
Teaching Assistant, “Physics 1251: E&M, Optics, and Quantum Mechanics”, OSU	Fall 2015

## OUTREACH AND SERVICE

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Physics Climate and Diversity Committee, OSU	January 2017-present
Coordinator for ASPIRE Workshop for High School Girls, OSU	July 2015-present
Volunteer Judge, Ohio State Science Day	2015-present
Talk, Columbus Science Pub	May 2018
Talk, The Wellington School, Columbus, OH	April 2018
Representative, Physics Graduate Student Council, OSU	October 2014-May 2017

## MENTORSHIP

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**Graduate Students:** Keith McBride, Andrés Medina, Jorge Torres-Espinosa

**Undergraduate Students:** Ian Best, Suren Gourapura, Hannah Hassan, Spoorthi Nagasmudram, Victoria Niu, Jude Rajasekera, Lucas Smith, Jason Torok

**High School Students:** Addison Hartman, Natalie Keyes