

BRIAN A. CLARK

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RESEARCH PROFILE

Experimental astrophysics PhD candidate at The Ohio State University and National Science Foundation Graduate Research Fellow, working with the Askaryan Radio Array (ARA). Interested in ultra-high energy neutrino astronomy, specifically the construction, simulation, and data analysis of radio-based Antarctic neutrino telescopes.

EDUCATION

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, <i>Cum Laude</i> –Advisor: Prof. Henric Krawczynski	

AWARDS

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

The Ohio State University , Columbus, OH USA	August 2014 - present
<i>Ph.D. Student</i> , 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

3. “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)
Submitted to Astroparticle Physics (2018). [arXiv:1807.03335]

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

RELEVANT SKILLS

Programming/Software	C++, C, Python, BASH, Energia, Code Composer Studio, PADS
Mechanical/Electrical	Surface mount soldering, power distribution, RF signal conditioning

TEACHING

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

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
Officer, Physics Graduate Student Council, OSU	October 2014-May 2017

MENTORSHIP

- Graduate Students:** Lauren Ennesser, Keith McBride, Andrés Medina, Julie Rolla, 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