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RESEARCH PROFILE

National Science Foundation Astronomy and Astrophysics Postdoctoral Fellow working in experimental particle-astrophysics on the Askaryan Radio Array and IceCube experiments. Interested in high energy neutrino astronomy, specifically the construction, simulation, and data analysis of neutrino telescopes.

EDUCATION

Ph.D. in Physics, The Ohio State University, Columbus, Ohio USA 2014-2019
Advisor: Prof. Amy Connolly

M.S. in Physics, The Ohio State University, Columbus, Ohio USA 2014-2016

B.A. in Physics, Washington University in St. Louis, St. Louis, Missouri USA 2010-2014
Cum Laude, Advisor: Prof. Henric Krawczynski

AWARDS

National Science Foundation Astronomy and Astrophysics Postdoctoral Fellowship 2019-2022
National Science Foundation Graduate Research Fellowship 2016-2019
APS Division of Astrophysics Travel Award 2017, 2019
Bunny and Thomas Clark Graduate Scholarship Honorable Mention 2019
OSU Graduate Enrichment Fellowship 2014-2015
WUSTL Undergraduate Physics Research Fellow Summer 2011

RESEARCH EXPERIENCE

Michigan State University, East Lansing, MI USA **August 2019 - present**
Postdoctoral Fellow

The Ohio State University, Columbus, OH USA **August 2014 - July 2019**
Ph.D. Student

Washington University in St. Louis, St. Louis, MO USA **October 2012 - May 2014**
Undergraduate Research Associate

SELECTED PUBLICATIONS

9. "Simulation and Sensitivity for a phased IceCube-Gen2 deployment"
B. A. Clark, R. Halliday, *et al.* for the IceCube-Gen2 Collaboration
PoS (ICRC2021)1186.

8. "Sensitivity Studies for the IceCube-Gen2 radio array"
S. Hallmann, **B. A. Clark**, C. Glaser, D. Smith, *et al.* for the IceCube-Gen2 Collaboration
PoS (ICRC2021)1183.

7. "Design and Sensitivity of the Radio Neutrino Observatory in Greenland (RNO-G)"
J.A. Aguilar *et al.* for the RNO-G Collaboration (incl. **B. A. Clark**)
JINST 16 (2021) 03, P03025. [arXiv:2010.12279]

6. "Constraints on the diffuse flux of ultrahigh energy neutrinos from four years of Askaryan Radio Array Data in two stations"
   P. Allison *et al.* for the ARA Collaboration (incl. **B. A. Clark** as corresponding author)
   Phys. Rev. D 102, 043021 (2020). [arXiv:1912.00987]

5. "Long-baseline horizontal radio-frequency transmission through polar ice"
   P. Allison *et al.* for the ARA Collaboration (incl. **B. A. Clark**)
   JCAP Vol 2020 No 12 Pg 009. [arXiv:1908.10689]

4. "NuRadioMC: Simulating the radio emission of neutrinos from interaction to detector"
   C. Glaser *et al.* (incl. **B. A. Clark**)
   Eur. Phys. J. C 80, 77 (2020). [arXiv:1906.01670]

3. "Design and Performance of an Interferometric Trigger Array for Radio Detection of High-Energy Neutrinos"
   P. Allison *et al.* for the ARA Collaboration (incl. **B. A. Clark**)
   Nuclear Instruments and Methods A Vol 930 Pg 112-125 (2019). [arXiv:1809.04573]

2. "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]

1. "Measurement of the real dielectric permittivity ϵ_r of glacial ice."
   P. Allison *et al.* for the ARA Collaboration (incl. **B. A. Clark**)
   Astroparticle Physics Vol 108 Pg 63-73 (2019). [arXiv:1712.03301]

0. "Analyzing the Data from X-ray Polarimeters with Stokes Parameters."
   F. Kislat, **B. Clark**, M. Bielicke, H. Krawczynski.
   Astroparticle Physics Vol 68 Pg 45-51 (2015). [arXiv:1409.6214]

I am also a co-author on all IceCube papers since 2020. Please note: it is the policy of the ARA and IceCube collaborations that authors be listed in alphabetical order.

SCIENTIFIC TALKS & POSTERS

National & International Conferences

9. Very Large Volume Neutrino Telescopes 2021 (virtual, invited) 2021/05/19
8. APS April Meeting 2021 (virtual) 2021/04/19
7. 19th Annual AAPF Symposium (virtual) 2021/02/09
6. NEUTRINO 2020 (virtual) 2020/06/21
5. 18th Annual AAPF Symposium at the 235th AAS Meeting, Honolulu HI. 2020/01/04
4. APS April Meeting 2019, Denver CO 2019/04/15
3. APS April Meeting 2018, Columbus OH 2018/04/16
2. TeV Particle Astrophysics, Columbus OH 2017/08/11
1. APS April Meeting 2017, Washington DC 2017/01/31

Colloquia, Seminars, and Other Talks

8. MSU Astronomy Seminar, East Lansing MI. 2019/10/23
7. OSU CCAPP Seminar, Columbus OH. 2019/07/16

6. Ohio Section of the APS Fall 2018 Meeting, Toledo OH. 2018/09/29
5. OSU CCAPP Seminar, Columbus OH 2018/05/22
4. Colloquium, College of Wooster Physics Department, Wooster OH (invited) 2016/10/04
3. Computing in High Energy Astropart. Phys. Research 2016, Columbus OH. 2016/05/26
2. OSU Physics Summer Seminar Series, Columbus OH 2016/04/23
1. Ohio Section of the APS Spring 2016 Meeting, Dayton OH 2016/04/09

OUTREACH AND SERVICE

Talk, MSU Science Festival	April 2021
Talk, Making Space for All	June 2020
Talk, Astronomy on Tap Lansing	October 2019
Coordinator for ASPIRE Workshop for High School Women, OSU	July 2015-June 2019
Volunteer Judge, Ohio State Science Day	2015-2019
Physics Climate and Diversity Committee, OSU	January 2017-May 2018
Talk, Columbus Science Pub	May 2018
Talk, The Wellington School, Columbus, OH	April 2018
Officer, Physics Graduate Student Council, OSU	October 2014-May 2017

TEACHING

The Ohio State University, Columbus, OH

TA Training Facilitator, University Center for the Advancement Teaching **August 2016**

- Facilitated two-day "introduction to teaching and learning" workshop for 30 first-time Teaching Assistants across the University's 40 STEM science programs.
- Built confidence in new TAs, guided development of teaching identities, addressed diversity in the classroom, and aided participant planning for long-term classroom success.

Teaching Assistant–"Astronomy 1143: Stars, Galaxies, and Cosmology" **Spring 2016**

- Aided student learning by teaching review sessions and lecturing when lead faculty was absent for 80 student introductory survey course, open to students across the university
- Moderated online forum, in collaboration with lead faculty, for students to exchange questions and clarify concepts.

Teaching Assistant–"Physics 1251: E&M, Optics, and Quantum Mechanics" **Fall 2015**

- Guided student learning in the recitation and laboratory context for four contact hours per week.
- Facilitated quantitative laboratory experiments including team-based problem solving exercises.
- Designed rubrics for fair, efficient, and consistent grading of quiz and examination instruments.

MENTORSHIP

Graduate Students:	Lauren Ennesser, Hieu Le, Keith McBride, Andrés Medina, Jessie Micallef, Julie Rolla, Jorge Torres-Espinosa
Undergraduate Students:	Suren Gourapura, Emma Hettinger, Hannah Hassan, Elizabeth Kowalczyk, Spoorthi Nagasmudram, Victoria Niu, Le Nguyen, Brandon Pries, Jude Rajasekera, Lucas Smith
High School Students:	Addison Hartman, Natalie Keyes

REFERENCES

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