CARL PFENDNER

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SUMMARY

- Particle astrophysicist with strong background in problem-solving, analysis, simulation, programming, statistics, collaborative work, and professional communication
- Led collaborative analysis and simulation projects on 3 collaborations (ARA, EVA, GENETIS), resulting in several publications
- Looking to apply skills outside academia to wider applications in business, industry, and government

PROFESSIONAL EXPERIENCE

Denison University   **Granville, OH**
Visiting Assistant Professor   *2019 - 2021*

Otterbein University   **Westerville, OH**
Visiting Assistant Professor   *2018 - 2019*

- Contributed to 2 highly collaborative projects contributing simulation results and data analysis techniques (C++, ROOT, Python)
- Organized weekly data analysis and simulation meetings
- Oversaw research by two undergraduates on simulation studies (C++, ROOT) (https://tinyurl.com/AndersonARASensitivity)
- Taught several undergraduate courses covering physics and technical quantitative skills (in-person and remote)

The Ohio State University   **Columbus, OH**
Postdoctoral Researcher, Lecturer   *2012-2018*

- Completed two detailed analyses of Askaryan Radio Array (ARA) data (C++, ROOT, Statistics) (Pubs. 2, 5)
- Developed novel and more efficient analysis techniques leading to published analysis of four years of data (C++, ROOT) (Pub. 1)
- Lead developer: Added flux models, ice models, improvements to ray tracing, improved geometry modelling, data-like output format, other improvements to ARA's AraSim simulation package (C++, ROOT)
- Simulated, tested, and analyzed antennas for ExaVolt Antenna (EVA) test study leading to publication (Matlab) (Pub. 3)
- Oversaw framework development for genetic algorithm to evolve specialized antenna designs, contributed to interface between multiple software packages in evolutionary loop (GENETIS collaboration) (bash, JavaScript, Python) (Pub. pending)
- Contributed to IceCube collaboration good run list management (Python)
- Mentored >10 undergraduate and graduate students in simulation and analysis research projects
- Gave more than 20 conference, workshop, and invited talk contributions domestically and internationally

EDUCATION

- M.A., Ph.D., Physics, University of Wisconsin - Madison, 2012
-     Dissertation: *A Bayesian Analysis of the Pierre Auger Cosmic Ray Energy Spectrum from Different Regions of the Sky*
- M.Phil., Philosophy of Religion, Cambridge University, 2006
- B.A., Physics/Classical Studies, University of Pennsylvania, 2005

SELECTED CONFERENCE PRESENTATIONS

- "Progress in In Situ UHE Neutrino Detectors: Joint Studies on Simulation and Ice", C. Pfendner for the ARA and ARIANNA Collaborations, TeVPA 2017, Columbus, OH, USA, August 2017.
- "Background rejection in the ARA experiment", C. Pfendner for the ARA Collaboration, ARENA 2016 conference talk, Groningen, NL, September 2016.
- "The ExaVolt Antenna", C. Pfendner, A. Connolly for the EVA Collaboration, Rio de Janeiro, Brazil, 6 July 2013, Session NU-IN

SELECTED PUBLICATIONS

1. "Constraints on the Diffuse Flux of Ultra-High Energy Neutrinos from Four Years of Askaryan Radio Array Data in Two Stations," Allison *et al.* (ARA Collaboration), Phys. Rev. D 102, 043021 (2020), arXiv:1912.00987.
2. "Constraints on the Ultra-High Energy Neutrino Flux from Gamma-Ray Bursts from a Prototype Station of the Askaryan Radio Array," P. Allison *et al.* (ARA Collaboration), Astropart.Phys. 88 (2017) 7-16, arXiv:1507.00100v2.
3. "Shape Analysis and Deployment of the ExaVolt Antenna," F. Baginski *et al.* (EVA collaboration), J. Astron. Instrum., 06 (2017) 1740004.
4. "Performance of two Askaryan Radio Array stations and first results in the search for ultrahigh energy neutrinos," P. Allison *et al.* (ARA Collaboration), Phys. Rev., D93 (2016) no 8, 082003, arxiv:1404.5285.
5. "First Constraints on the Ultra-High Energy Neutrino Flux from a Prototype Station of the Askaryan Radio Array," P. Allison *et al.* (ARA Collaboration), Astroparticle Physics, 70 (2015) 62-80, arxiv:1404.5285.
6. "A Bayesian Approach to Comparing Cosmic Ray Energy Spectra," S.Y. BenZvi, B. Connolly, C. Pfendner, and S. Westerhoff, Astrophys. J., **738**, 82 (2012).

OTHER SKILLS

Professional software experience LaTeX, Slack, Matlab, XFdtd, Microsoft Office, Google Apps (Sheets, Forms, Meet, etc), Zoom
Operating Systems Linux (bash), Mac OSX, Windows
Languages English: native. French: conversational.