Carolyn 'Carrie' Volpert

Education

University of Maryland — College Park, MD
Astronomy PhD program — *Aug. 2018 – Present*

University of Chicago — Chicago, IL
Bachelor's degree in Physics (specialization in astrophysics) — *Sept. 2013 – June 2017*

Experience

Graduate Research Assistant — Feb. 2019 – Present
NASA Goddard Spaceflight Center — *Greenbelt, MD*

- Performed cryogenic testing and calibration measurements of dark prototype thin-film Al MKIDs (superconducting far-infrared detector devices)
- Designed the instrument calibration test-plan for the micro-spectrometer (still in fabrication)
- Built and installed new cryogenic test-bed components
- Developed code for detector data processing and noise analysis
- Established strategies for in-flight and post-flight instrument calibration (astrometry, atmospheric loading, beam size and shape, etc.
- Motivated scientific observation of CI in the Milky Way, and calculated the necessary sensitivities
- Currently hosts and runs the EXCLAIM group GitHub repository

Graduate Teaching Assistant — Aug. 2018 – Jan. 2019
University of Maryland — *College Park, MD*

- Instructed Astronomy 101 labs and discussion sections for a group of 40 undergraduates
- Received positive evaluations from students

Post-graduate Research Assistant — June 2017 – June 2018
University of Chicago — *Chicago, IL*

- Continued previous work on HAWC+ NASA SOFIA instrument
- Developed code for pointing and source identification and verification in post-flight data
- Developed code to perform real-time data quality analysis
- Participated in diagnosing instrument cryogen and optical alignment problems using ground test data
- Flew with the HAWC+ instrument on several SOFIA flights to test my real-time data quality analysis software

Undergraduate Research Assistant — Jan. 2015 – June 2017
University of Chicago — *Chicago, IL*

- Contributed to building and testing the data pipeline used to process data from the HAWC+ instrument on NASA's project SOFIA
- Wrote code to perform phase calibration, noise elimination, and error analysis of HAWC+ initial data
- Was awarded a Metcalf Internship to continue scientific summer research

Leadership and Outreach

Yerkes Workshops — Dec. 2014 – June 2017

- Founded a series of skill-based astronomy instrumentation workshops at the Yerkes Observatory for graduate students
- Organized logistics, wrote the curriculum, and lead workshop sessions
- Arranged guest speakers, travel to and from the observatory, and secured funding to ensure the opportunity was free for students
- Taught over 120 students over the course of 2.5 years

Astronomy Major Committee — Sept. 2016 – June 2017

- Was invited to serve as the undergraduate representative on the University of Chicago dept. of Astronomy committee assembled to address the creation of a new astronomy major
- Advocated to the committee for the creation of an undergraduate major

- Participated in designing the curriculum and requirements for the new major
- Saw the first students graduate with the new astronomy major in 2019

GRAD-MAP Mentor Present

- Joined the Graduate Resources for Advancing Diversity with Maryland Astronomy and Physics initiative, which focuses on helping minority undergraduates gain the skills to become competitive grad school applicants
- Joined as a student project mentor for the 2020 Winter Workshop

Technical Skills

Programming Languages:Python, some C/C++, some MATLAB, HTML/CSS
Lab Skills: operation of transition edge sensors, operation of kinetic inductance detectors, RF readout and wiring, handling sub-K cryogenic systems, lab electronics (soldering, cable making, etc.), cryogenic test-bed component installation, epoxy handling, managing vacuum systems, leak checking, building test-beds, optical alignment, other misc. lab task skills
Data Analysis: noise-equivalent-power and noise-equivalent-intensity modeling, image and spectral convolution, fitting data to physical models, two-level system noise modeling, observation field-of-view and scan strategy simulation
Developer Tools: Git, Google Cloud Platform, PyCharm, Sublime, Spyder
Libraries: Numpy, Scipy, Matplotlib, Astropy, Healpy, Pandas, Pyfits, Statsmodels, Scraps

Publications

1. Oxholm, T; Ade, PA et al. (EXCLAIM collaboration team including **Carolyn Volpert**), American Astronomical Society Meeting Abstracts 236, 02/2020
title: ***The EXperiment for Large-Aperture Intensity Mapping***

2. Ade, PA; Anderson, CJ; Barrentine, EM; et al. (EXCLAIM collaboration team including **Carolyn Volpert**), Low Temperature Physics, 10/2019
title: ***The EXperiment for Large-Aperture Intensity Mapping (EXCLAIM)***

3. Santos, FP; Chuss, DT; Dowell, CD, et al. (HAWC+ collaboration team including **Carolyn Volpert**), The Astrophysical Journal, 882, 09/2019
title: ***The far-infrared polarization spectrum of Rho Ophiuchi A from HAWC+/SOFIA observations***

4. Chuss, DT; Andersson, BG; Bally, J; et al. (HAWC+ collaboration team including **Carolyn Volpert**), The Astrophysical Journal, 872, 2/2019
title: ***HAWC+/SOFIA Multiwavelength Polarimetric Observations of OMC-1***

5. Jones, TJ; Dowell, CD; Rodriguez, ER, et al. (HAWC+ collaboration team including **Carolyn Volpert**), Astrophysical Journal Letters, 870, 01/2019
title: ***SOFIA Far-infrared Imaging Polarimetry of M82 and NGC 253: Exploring the Supergalactic Wind***

6. Harper, DA; Runyan, MC; Dowell, CD, et al. (HAWC+ collaboration team including **Carolyn Volpert**), Journal of Astronomical Instrumentation, 7, 04, 12/2018
title: ***HAWC+, The Far-infrared Camera and Polarimeter for SOFIA***

7. Bradstreet, David H; Sanders, SJ; **Volpert, CG**;, American Astronomical Society Meeting Abstracts, 221 01/2013
title: ***Light Curves and Analyses of the Eclipsing Overcontact Binaries V546 And V566 And the Discovery of a New Variable Star***