Philip S. Cowperthwaite

Contact Information	Philip S. Cowperthwaite Carnegie Observatories 813 Santa Barbara St. Pasadena, CA 91101	*Office:* +1-626-304-0265 *Mobile:* +1-301-788-3369 *URL:* www.pscastro.com *E-mail:* pcowperthwaite@carnegiescience.edu

Citizenship USA

Research Interests Electromagnetic counterparts to gravitational wave events. Theoretical modeling of optical transients associated with binary neutron star mergers (e.g., kilonovae). General time-domain astrophysics: contamination in optical surveys, survey design and optimization, rapid timescale transients. Large-scale astronomy image processing and pipeline development for surveys.

Education

Harvard University, Cambridge, Massachusetts USA
A.M., Astronomy, Spring 2015
Ph.D., Astronomy, Spring 2018
- From Design to Detection: Joint Gravitational Wave and Electromagnetic Astronomy
- Advisor: Prof. Edo Berger

The University of Maryland at College Park, College Park, Maryland USA
B.S., Summa Cum Laude, Astronomy with High Honors, Spring 2013
B.S., Summa Cum Laude, Physics, Spring 2013
- Minor in Mathematics

Positions

Carnegie Observatories, Pasadena, California USA
NASA Hubble Postdoctoral Fellow, 2018-2021

Awards

National Aeronautics and Space Administration
- Hubble Postdoctoral Fellow, 2018-2021

American Astronomical Society
- Rodger Doxsey Travel Prize, 2018

Harvard University
- Fireman Thesis Prize, 2018
- Harvard Horizons Finalist, 2018
- Merit Fellowship, 2017–2018
- John Parker Bequest Grant, 2017–2018
- John P. and Carol J. Merrill Graduate Fellow, 2014–15

National Science Foundation
- Graduate Research Fellowship, 2013–18
- Research Experience for Undergraduates Summer Fellowship, 2012

University of Maryland, College Park
- University Medal Finalist, 2013
- J.R. Dorfman Prize for Outstanding Undergraduate Research, 2013

Center for Research and Exploration in Space Science and Technology
- Summer Research Fellowship, 2011

The State of Maryland
- Howard P. Rawlings Grant, 2010–2012
- Maryland Delegates Grant, 2010–12

Professional Experience

ComSciCon – Local Organizing Committee 2017
Astrophysical Journal Letters – Referee
American Physical Society – Member
American Astronomical Society – Junior Member

Research Experience

NSF Graduate Research Fellow, Harvard University
Optical Follow-Up of Gravitational Wave Events **Fall 2013 to Spring 2018**
- Advisor: Prof. Edo Berger

REU Summer Research Internship, Smithsonian Astrophysical Observatory
Infrared Spectroscopy of Blazars **Summer 2012**
- Advisors: Drs. Howard A. Smith and Raffaele D'Abrusco

Undergraduate Research Assistant, The University of Maryland, College Park
Numerical Simulations of Accretion Flows **Fall 2012 to Summer 2013**
- Advisor: Prof. Christopher S. Reynolds
- Senior Thesis, Awarded High Honors

X-Ray Spectroscopy of Active Galactic Nuclei **Fall 2010 to Spring 2012**
- Advisor: Prof. Christopher S. Reynolds
- Joint Space Science Institute Undergraduate Research Scholar

Visualizations of Black Hole Accretion Flows **Spring 2010 to Fall 2010**
- Advisor: Prof. Christopher S. Reynolds

CRESST Summer Research Internship, NASA/Goddard Space Flight Center
Visualizations of Merging Black Hole Binaries **Summer 2011**
- Advisors: Drs. John Baker and Bruno Giacomazzo

Mentoring Experience

Harvard University, Cambridge, Massachusetts USA
Research Advisor for Undergraduates
- Mahlet Shiferaw – Galaxy Catalogs for GW/EM Follow-Up – Summer 2017
- Samuel Liu – Data Science Techniques for Light Curve Analysis – Summer 2016

Teaching Experience

Harvard University, Cambridge, Massachusetts USA
Graduate Teaching Fellow
- Astronomy 16 – Stellar and Planetary Astronomy – Spring 2016
- Astronomy 200 – Radiative Processes – Spring 2014
  - Certificate of Teaching Excellence – Bok Center for Teaching

University of Maryland College Park, College Park, Maryland USA
Undergraduate Teaching Assistant
- Astronomy 100 – Introduction to Astronomy – Fall 2011 to Spring 2013
- Astronomy 120 – Introductory Astrophysics – Fall 2012 (Grader)

Observational Experience

Blanco Telescope, Cerro Tololo Inter-American Observatory, Chile
- DECam – DES-GW LIGO Follow-up – 125 hours total

Magellan Telescope, Las Campanas Observatory, Chile
- Clay 6.5m – LDSS3-C – 3 nights
- Baade 6.5m – IMACS – 8 nights

MMT, Fred Lawrence Whipple Observatory, USA
- BlueChannel – 3 nights

Technical Skills

Programming: Python, R, C/C++, Perl, Mathematica, MATLAB, Git **Science Applications:** SAO DS9, HEASoft, *Spitzer* SMART software, IDL Astrolib Tools, VISIT, Gnuplot, IRAF

Published Works

As of September 10, 2018 I am an author on 32 refereed publications (7 as first author), my h-index is 23 and my refereed publications have 1972 citations. First author papers are shown here. A full publication list is available below.

Cowperthwaite, P. S., Berger, E., Rest, A., & et al., "The LIGO "Dry-Run": An Empirical Study of Contamination in Wide-Field Optical Follow-Up of Gravitational Wave Events" 2018, ApJ, 858, 18

Cowperthwaite, P. S., Berger, E., Villar, V. A., & et al., "The Electromagnetic Counterpart of the Binary Neutron Star Merger LIGO/VIRGO GW170817. II. UV, Optical, and Near-IR Light Curves and Comparison to Kilonova Models" 2017, ApJL, 848, L17

Cowperthwaite, P. S., Berger, E., Soares-Santos, M., & et al., "A DECam Search for an Optical Counterpart to the LIGO Gravitational-wave Event GW151226" 2016, ApJL, 826, L29

Cowperthwaite, P. S., & Berger, E., "A Comprehensive Study of Detectability and Contamination in Deep Rapid Optical Searches for Gravitational Wave Counterparts" 2015, ApJ, 814, 25

Cowperthwaite, P. S., & Reynolds, C. S. "Nonlinear Dynamics of Accretion Disks with Stochastic Viscosity," 2014, ApJ, 791, 126

Cowperthwaite, P. S., Massaro, F., D'Abrusco, R., & et al., "Identification of New Blazar Candidates With Multifrequency Archival Observations," 2013, AJ, 146, 110

Cowperthwaite, P. S. & Reynolds, C. S., "The Central Engine Structure of 3C120: Evidence for a Retrograde Black Hole or a Refilling Accretion Disk," 2012, ApJ, 752, L21

Conferences and Presentations

As of September 10,2018 I have given 26 presentations of which 23 have been talks and 3 have been posters.

References

Prof. Edo Berger (e-mail: eberger@cfa.harvard.edu; phone: +617-495-7914)
- Professor, Astronomy, Harvard University

Prof. Brian Metzger (e-mail: bdm2129@columbia.edu; phone: +212-854-9702)
- Assistant Professor, Department of Physics, Columbia University

Prof. Daniel E. Holz (e-mail: dholz@uchicago.edu; phone: +773-834-3306)
- Associate Professor, KICP, The University of Chicago

Prof. Daniel Eisenstein (e-mail: deisenstein@cfa.harvard.edu; phone: +617-495-7530)
- Professor, Astronomy, Harvard University