

## Philip S. Cowperthwaite

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CONTACT INFORMATION	Philip S. Cowperthwaite Carnegie Observatories 813 Santa Barbara St. Pasadena, CA 91101	<i>Office:</i> +1-626-304-0265 <i>Mobile:</i> +1-301-788-3369 <i>URL:</i> <a href="http://www.pscastro.com">www.pscastro.com</a> <i>E-mail:</i> <a href="mailto:pcowperthwaite@carnegiescience.edu">pcowperthwaite@carnegiescience.edu</a>
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	<b>Harvard University</b> , Cambridge, Massachusetts USA A.M., Astronomy, Spring 2015 Ph.D., Astronomy, Spring 2018 <ul style="list-style-type: none"><li>• From Design to Detection: Joint Gravitational Wave and Electromagnetic Astronomy</li><li>• Advisor: Prof. Edo Berger</li></ul> <b>The University of Maryland at College Park</b> , College Park, Maryland USA B.S., Summa Cum Laude, Astronomy with High Honors, Spring 2013 B.S., Summa Cum Laude, Physics, Spring 2013 <ul style="list-style-type: none"><li>• Minor in Mathematics</li></ul>	
POSITIONS	<b>Carnegie Observatories</b> , Pasadena, California USA NASA Hubble Postdoctoral Fellow, 2018-2021	
AWARDS	<b>National Aeronautics and Space Administration</b> <ul style="list-style-type: none"><li>• Hubble Postdoctoral Fellow, 2018-2021</li></ul> <b>American Astronomical Society</b> <ul style="list-style-type: none"><li>• Rodger Doxsey Travel Prize, 2018</li></ul> <b>Harvard University</b> <ul style="list-style-type: none"><li>• Fireman Thesis Prize, 2018</li><li>• Harvard Horizons Finalist, 2018</li><li>• Merit Fellowship, 2017–2018</li><li>• John Parker Bequest Grant, 2017–2018</li><li>• John P. and Carol J. Merrill Graduate Fellow, 2014–15</li></ul> <b>National Science Foundation</b> <ul style="list-style-type: none"><li>• Graduate Research Fellowship, 2013–18</li><li>• Research Experience for Undergraduates Summer Fellowship, 2012</li></ul> <b>University of Maryland, College Park</b> <ul style="list-style-type: none"><li>• University Medal Finalist, 2013</li><li>• J.R. Dorfman Prize for Outstanding Undergraduate Research, 2013</li></ul> <b>Center for Research and Exploration in Space Science and Technology</b> <ul style="list-style-type: none"><li>• Summer Research Fellowship, 2011</li></ul> <b>The State of Maryland</b> <ul style="list-style-type: none"><li>• Howard P. Rawlings Grant, 2010–2012</li><li>• Maryland Delegates Grant, 2010–12</li></ul>	

PROFESSIONAL EXPERIENCE	<b>ComSciCon – Local Organizing Committee 2017</b> <b>Astrophysical Journal Letters – Referee</b> <b>American Physical Society – Member</b> <b>American Astronomical Society – Junior Member</b>
RESEARCH EXPERIENCE	<b>NSF Graduate Research Fellow</b> , Harvard University <i>Optical Follow-Up of Gravitational Wave Events</i> <b>Fall 2013 to Spring 2018</b> <ul style="list-style-type: none"> <li>• Advisor: Prof. Edo Berger</li> </ul> <b>REU Summer Research Internship</b> , Smithsonian Astrophysical Observatory <i>Infrared Spectroscopy of Blazars</i> <b>Summer 2012</b> <ul style="list-style-type: none"> <li>• Advisors: Drs. Howard A. Smith and Raffaele D’Abrusco</li> </ul> <b>Undergraduate Research Assistant</b> , The University of Maryland, College Park <i>Numerical Simulations of Accretion Flows</i> <b>Fall 2012 to Summer 2013</b> <ul style="list-style-type: none"> <li>• Advisor: Prof. Christopher S. Reynolds</li> <li>• Senior Thesis, Awarded High Honors</li> </ul> <i>X-Ray Spectroscopy of Active Galactic Nuclei</i> <b>Fall 2010 to Spring 2012</b> <ul style="list-style-type: none"> <li>• Advisor: Prof. Christopher S. Reynolds</li> <li>• Joint Space Science Institute Undergraduate Research Scholar</li> </ul> <i>Visualizations of Black Hole Accretion Flows</i> <b>Spring 2010 to Fall 2010</b> <ul style="list-style-type: none"> <li>• Advisor: Prof. Christopher S. Reynolds</li> </ul> <b>CRESST Summer Research Internship</b> , NASA/Goddard Space Flight Center <i>Visualizations of Merging Black Hole Binaries</i> <b>Summer 2011</b> <ul style="list-style-type: none"> <li>• Advisors: Drs. John Baker and Bruno Giacomazzo</li> </ul>
MENTORING EXPERIENCE	<b>Harvard University</b> , Cambridge, Massachusetts USA <i>Research Advisor for Undergraduates</i> <ul style="list-style-type: none"> <li>• Mahlet Shiferaw – Galaxy Catalogs for GW/EM Follow-Up – Summer 2017</li> <li>• Samuel Liu – Data Science Techniques for Light Curve Analysis – Summer 2016</li> </ul>
TEACHING EXPERIENCE	<b>Harvard University</b> , Cambridge, Massachusetts USA <i>Graduate Teaching Fellow</i> <ul style="list-style-type: none"> <li>• Astronomy 16 – Stellar and Planetary Astronomy – Spring 2016</li> <li>• Astronomy 200 – Radiative Processes – Spring 2014</li> <li>• Certificate of Teaching Excellence – Bok Center for Teaching</li> </ul> <b>University of Maryland College Park</b> , College Park, Maryland USA <i>Undergraduate Teaching Assistant</i> <ul style="list-style-type: none"> <li>• Astronomy 100 – Introduction to Astronomy – Fall 2011 to Spring 2013</li> <li>• Astronomy 120 – Introductory Astrophysics – Fall 2012 (Grader)</li> </ul>
OBSERVATIONAL EXPERIENCE	<b>Blanco Telescope, Cerro Tololo Inter-American Observatory, Chile</b> <ul style="list-style-type: none"> <li>• DECam – DES-GW LIGO Follow-up – 125 hours total</li> </ul> <b>Magellan Telescope, Las Campanas Observatory, Chile</b> <ul style="list-style-type: none"> <li>• Clay 6.5m – LDSS3-C – 3 nights</li> <li>• Baade 6.5m – IMACS – 8 nights</li> </ul> <b>MMT, Fred Lawrence Whipple Observatory, USA</b> <ul style="list-style-type: none"> <li>• BlueChannel – 3 nights</li> </ul>
TECHNICAL SKILLS	<b>Programming:</b> Python, R, C/C++, Perl, Mathematica, MATLAB, Git <b>Science Applications:</b> SAO DS9, HEASoft, <i>Spitzer</i> 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

# Philip S. Cowperthwaite

## Publications

Updated Sep 10, 2018. The most recent version of this list may be found online at <http://www.pscastro.com>. ADS citation counts are shown in square brackets. I am an author on 32 refereed publications (7 as first author), my *h*-index is 23 and my refereed publications have 1972 citations.

## Refereed

32. KD Alexander, R Margutti, PK Blanchard, W Fong, E Berger, A Hajela, T Eftekhari, R Chornock, **PS Cowperthwaite**, D Giannios, C Guidorzi, A Kathirgamaraju, A MacFadyen, BD Metzger, M Nicholl, L Sironi, VA Villar, PKG Williams, X Xie, J Zrake. “*A Decline in the X-Ray through Radio Emission from GW170817 Continues to Support an Off-axis Structured Jet.*” 2018, [ApJ 863 L18](#) [24].
31. VA Villar, **PS Cowperthwaite**, E Berger, PK Blanchard, S Gomez, KD Alexander, R Margutti, R Chornock, T Eftekhari, GG Fazio, J Guillochon, JL Hora, M Nicholl, PKG Williams. “*Spitzer Space Telescope Infrared Observations of the Binary Neutron Star Merger GW170817.*” 2018, [ApJ 862 L11](#) [3].
30. J Guillochon, **PS Cowperthwaite**. “*Open Astronomy Catalogs API.*” 2018, [RNAAS 2 27](#).
29. **PS Cowperthwaite**, E Berger, A Rest, R Chornock, DM Scolnic, PKG Williams, W Fong, MR Drout, RJ Foley, R Margutti, R Lunnan, BD Metzger, E Quataert. “*An Empirical Study of Contamination in Deep, Rapid, and Wide-field Optical Follow-up of Gravitational Wave Events.*” 2018, [ApJ 858 18](#) [1].
28. R Margutti, KD Alexander, X Xie, L Sironi, BD Metzger, A Kathirgamaraju, W Fong, PK Blanchard, E Berger, A MacFadyen, D Giannios, C Guidorzi, A Hajela, R Chornock, **PS Cowperthwaite**, T Eftekhari, M Nicholl, VA Villar, PKG Williams, J Zrake. “*The Binary Neutron Star Event LIGO/Virgo GW170817 160 Days after Merger: Synchrotron Emission across the Electromagnetic Spectrum.*” 2018, [ApJ 856 L18](#) [61].
27. M Cantiello, JB Jensen, JP Blakeslee, E Berger, AJ Levan, NR Tanvir, G Raimondo, E Brocato, KD Alexander, PK Blanchard, M Branchesi, Z Cano, R Chornock, S Covino, **PS Cowperthwaite**, P D’Avanzo, T Eftekhari, W Fong, AS Fruchter, A Grado, J Hjorth, DE Holz, JD Lyman, I Mandel, R Margutti, M Nicholl, VA Villar, PKG Williams. “*A Precise Distance to the Host Galaxy of the Binary Neutron Star Merger GW170817 Using Surface Brightness Fluctuations.*” 2018, [ApJ 854 L31](#) [14].
26. D Scolnic, R Kessler, D Brout, **PS Cowperthwaite**, M Soares-Santos, J Annis, K Herner, H-Y Chen, M Sako, Z Doctor, Butler. “*How Many Kilonovae Can Be Found in Past, Present, and Future Survey Data Sets?.*” 2018, [ApJ 852 L3](#) [8].
25. VA Villar, J Guillochon, E Berger, BD Metzger, **PS Cowperthwaite**, M Nicholl, KD Alexander, PK Blanchard, R Chornock, T Eftekhari, W Fong, R Margutti, PKG Williams. “*The Combined Ultraviolet, Optical, and Near-infrared Light Curves of the Kilonova Associated with the Binary Neutron Star Merger GW170817: Unified Data Set, Analytic Models, and Physical Implications.*” 2017, [ApJL 851 L21](#) [56].
24. C Guidorzi, R Margutti, D Brout, D Scolnic, W Fong, KD Alexander, **PS Cowperthwaite**, J Annis, E Berger, PK Blanchard, R Chornock, DL Coppejans, T Eftekhari, JA Frieman, D Huterer, M Nicholl, M Soares-Santos, G Terreran, VA Villar, PKG Williams. “*Improved Constraints on  $H_0$  from a Combined Analysis of Gravitational-wave and Electromagnetic Emission from GW170817.*” 2017, [ApJ 851 L36](#) [27].
23. BP Abbott, R Abbott, TD Abbott, F Acernese, K Ackley, C Adams, T Adams, P Addesso, RX Adhikari, VB Adya, **al.** “*A gravitational-wave standard siren measurement of the Hubble constant.*” 2017, [Nature 551 85-88](#) [130].

22. W Fong, E Berger, PK Blanchard, R Margutti, **PS Cowperthwaite**, R Chornock, KD Alexander, BD Metzger, VA Villar, M Nicholl, T Eftekhari, PKG Williams, J Annis, D Brout, DA Brown, H-Y Chen, Z Doctor, HT Diehl, DE Holz, A Rest, M Sako, M Soares-Santos. “*The Electromagnetic Counterpart of the Binary Neutron Star Merger LIGO/Virgo GW170817. VIII. A Comparison to Cosmological Short-duration Gamma-Ray Bursts.*” 2017, [ApJL 848 L23](#) [35].
21. PK Blanchard, E Berger, W Fong, M Nicholl, J Leja, C Conroy, KD Alexander, R Margutti, PKG Williams, Z Doctor, R Chornock, VA Villar, **PS Cowperthwaite**, J Annis, D Brout, DA Brown, H-Y Chen, T Eftekhari, JA Frieman, DE Holz, BD Metzger, A Rest, M Sako, M Soares-Santos. “*The Electromagnetic Counterpart of the Binary Neutron Star Merger LIGO/Virgo GW170817. VII. Properties of the Host Galaxy and Constraints on the Merger Timescale.*” 2017, [ApJL 848 L22](#) [30].
20. KD Alexander, E Berger, W Fong, PKG Williams, C Guidorzi, R Margutti, BD Metzger, J Annis, PK Blanchard, D Brout, DA Brown, H-Y Chen, R Chornock, **PS Cowperthwaite**, M Drout, T Eftekhari, J Frieman, DE Holz, M Nicholl, A Rest, M Sako, M Soares-Santos, VA Villar. “*The Electromagnetic Counterpart of the Binary Neutron Star Merger LIGO/Virgo GW170817. VI. Radio Constraints on a Relativistic Jet and Predictions for Late-time Emission from the Kilonova Ejecta.*” 2017, [ApJL 848 L21](#) [91].
19. R Margutti, E Berger, W Fong, C Guidorzi, KD Alexander, BD Metzger, PK Blanchard, **PS Cowperthwaite**, R Chornock, T Eftekhari, M Nicholl, VA Villar, PKG Williams, J Annis, DA Brown, H Chen, Z Doctor, JA Frieman, DE Holz, M Sako, M Soares-Santos. “*The Electromagnetic Counterpart of the Binary Neutron Star Merger LIGO/Virgo GW170817. V. Rising X-Ray Emission from an Off-axis Jet.*” 2017, [ApJL 848 L20](#) [112].
18. R Chornock, E Berger, D Kasen, **PS Cowperthwaite**, M Nicholl, VA Villar, KD Alexander, PK Blanchard, T Eftekhari, W Fong, R Margutti, PKG Williams, J Annis, D Brout, DA Brown, H-Y Chen, MR Drout, B Farr, RJ Foley, JA Frieman, CL Fryer, K Herner, DE Holz, R Kessler, T Matheson, BD Metzger, E Quataert, A Rest, M Sako, DM Scolnic, N Smith, M Soares-Santos. “*The Electromagnetic Counterpart of the Binary Neutron Star Merger LIGO/Virgo GW170817. IV. Detection of Near-infrared Signatures of r-process Nucleosynthesis with Gemini-South.*” 2017, [ApJL 848 L19](#) [85].
17. M Nicholl, E Berger, D Kasen, BD Metzger, J Elias, C Briceño, KD Alexander, PK Blanchard, R Chornock, **PS Cowperthwaite**, T Eftekhari, W Fong, R Margutti, VA Villar, PKG Williams, W Brown, J Annis, A Bahramian, D Brout, DA Brown, H-Y Chen, JC Clemens, E Dennihy, B Dunlap, DE Holz, E Marchesini, F Massaro, N Moskowitz, I Pelisoli, A Rest, F Ricci, M Sako, M Soares-Santos, J Strader. “*The Electromagnetic Counterpart of the Binary Neutron Star Merger LIGO/Virgo GW170817. III. Optical and UV Spectra of a Blue Kilonova from Fast Polar Ejecta.*” 2017, [ApJL 848 L18](#) [89].
16. **PS Cowperthwaite**, E Berger, VA Villar, BD Metzger, M Nicholl, R Chornock, PK Blanchard, W Fong, R Margutti, M Soares-Santos, KD Alexander, S Allam, J Annis, D Brout, DA Brown, RE Butler, H-Y Chen, HT Diehl, Z Doctor, MR Drout, T Eftekhari, B Farr, DA Finley, RJ Foley, JA Frieman, CL Fryer, J García-Bellido, MSS Gill, J Guillochon, K Herner, DE Holz, D Kasen, R Kessler, J Marriner, T Matheson, JEH Neilsen, E Quataert, A Palmese, A Rest, M Sako, DM Scolnic, N Smith, DL Tucker, PKG Williams, E Balbinot, JL Carlin, ER Cook, F Durret, TS Li, PAA Lopes, ACC Lourenço, JL Marshall, GE Medina, J Muir, RR Muñoz, M Sauseda, DJ Schlegel, LF Secco, AK Vivas, W Wester, A Zenteno, Y Zhang, TMC Abbott, M Banerji, K Bechtol, A Benoit-Lévy, E Bertin, E Buckley-Geer, DL Burke, D Capozzi, A Carnero Rosell, M Carrasco Kind, FJ Castander, M Crocce, CE Cunha, CB D’Andrea, LN da Costa, C Davis, DL DePoy, S Desai, JP Dietrich, A Drlica-Wagner, TF Eifler, AE Evrard, E Fernandez, B Flaugher, P Fosalba, E Gaztanaga, DW Gerdes, T Giannantonio, DA Goldstein, D Gruen, RA Gruendl, G Gutierrez, K Honscheid, B Jain, DJ James, T Jeltama, MWG Johnson, MD Johnson, S Kent, E Krause, R Kron, K Kuehn, N Nuropatkin, O Lahav, M Lima, H Lin, MAG Maia, M March, P Martini, RG McMahon, F Menanteau, CJ Miller, R Miquel, JJ Mohr, E Neilsen, RC Nichol, RLC Ogando, AA Plazas, N Roe, AK Romer, A Roodman, ES Rykoff, E Sanchez, V Scarpine, R Schindler, M Schubnell, I Sevilla-Noarbe, M Smith, RC Smith, F Sobreira, E Suchyta, MEC Swanson, G Tarle, D Thomas, RC Thomas, MA Troxel, V

Vikram, AR Walker, RH Wechsler, J Weller, B Yanny, J Zuntz. “*The Electromagnetic Counterpart of the Binary Neutron Star Merger LIGO/Virgo GW170817. II. UV, Optical, and Near-infrared Light Curves and Comparison to Kilonova Models.*” 2017, [ApJL 848 L17](#) [134].

15. M Soares-Santos, DE Holz, J Annis, R Chornock, K Herner, E Berger, D Brout, H-Y Chen, R Kessler, M Sako, S Allam, DL Tucker, RE Butler, A Palmese, Z Doctor, HT Diehl, J Frieman, B Yanny, H Lin, D Scolnic, **PS Cowperthwaite**, E Neilsen, J Marriner, N Kuropatkin, WG Hartley, F Paz-Chinchón, KD Alexander, E Balbinot, P Blanchard, DA Brown, JL Carlin, C Conselice, ER Cook, A Drlica-Wagner, MR Drout, F Durret, T Eftekhari, B Farr, DA Finley, RJ Foley, W Fong, CL Fryer, J García-Bellido, MSS Gill, RA Gruendl, C Hanna, D Kasen, TS Li, PAA Lopes, ACC Lourenço, R Margutti, JL Marshall, T Matheson, GE Medina, BD Metzger, RR Muñoz, J Muir, M Nicholl, E Quataert, A Rest, M Sauseda, DJ Schlegel, LF Secco, F Sobreira, A Stebbins, VA Villar, K Vivas, AR Walker, W Wester, PKG Williams, A Zenteno, Y Zhang, TMC Abbott, FB Abdalla, M Banerji, K Bechtol, A Benoit-Lévy, E Bertin, D Brooks, E Buckley-Geer, DL Burke, A Carnero Rosell, M Carrasco Kind, J Carretero, FJ Castander, M Crocce, CE Cunha, CB D’Andrea, LN da Costa, C Davis, S Desai, JP Dietrich, P Doel, TF Eifler, E Fernandez, B Flaugher, P Fosalba, E Gaztanaga, DW Gerdes, T Giannantonio, DA Goldstein, D Gruen, J Gschwend, G Gutierrez, K Honscheid, B Jain, DJ James, T Jeltama, MWG Johnson, MD Johnson, S Kent, E Krause, R Kron, K Kuehn, S Kuhlmann, O Lahav, M Lima, MAG Maia, M March, RG McMahon, F Menanteau, R Miquel, JJ Mohr, RC Nichol, B Nord, RLC Ogando, D Petravick, AA Plazas, AK Romer, A Roodman, ES Rykoff, E Sanchez, V Scarpine, M Schubnell, I Sevilla-Noarbe, M Smith, RC Smith, E Suchyta, MEC Swanson, G Tarle, D Thomas, RC Thomas, MA Troxel, V Vikram, RH Wechsler, J Weller, DE Survey, DECGW-EM Collaboration. “*The Electromagnetic Counterpart of the Binary Neutron Star Merger LIGO/Virgo GW170817. I. Discovery of the Optical Counterpart Using the Dark Energy Camera.*” 2017, [ApJL 848 L16](#) [95].
14. BP Abbott, R Abbott, TD Abbott, F Acernese, K Ackley, C Adams, T Adams, P Addesso, RX Adhikari, VB Adya, **al.** “*Multi-messenger Observations of a Binary Neutron Star Merger.*” 2017, [ApJL 848 L12](#) [457].
13. R Lunnan, R Chornock, E Berger, D Milisavljevic, DO Jones, A Rest, W Fong, C Fransson, R Margutti, MR Drout, PK Blanchard, P Challis, **PS Cowperthwaite**, RJ Foley, RP Kirshner, N Morrell, AG Riess, KC Roth, D Scolnic, SJ Smartt, KW Smith, VA Villar, KC Chambers, PW Draper, ME Huber, N Kaiser, R-P Kudritzki, EA Magnier, N Metcalfe, C Waters. “*PS1-14bj: A Hydrogen-poor Superluminous Supernova With a Long Rise and Slow Decay.*” 2016, [ApJ 831 144](#) [38].
12. M Nicholl, E Berger, R Margutti, R Chornock, PK Blanchard, A Jerkstrand, SJ Smartt, I Arcavi, P Challis, KC Chambers, T-W Chen, **PS Cowperthwaite**, A Gal-Yam, G Hosseinzadeh, DA Howell, C Inserra, E Kankare, EA Magnier, K Maguire, PA Mazzali, C McCully, D Milisavljevic, KW Smith, S Taubenberger, S Valenti, RJ Wainscoat, O Yaron, DR Young. “*Superluminous Supernova SN 2015bn in the Nebular Phase: Evidence for the Engine-powered Explosion of a Stripped Massive Star.*” 2016, [ApJL 828 L18](#) [29].
11. **PS Cowperthwaite**, E Berger, M Soares-Santos, J Annis, D Brout, DA Brown, E Buckley-Geer, SB Cenko, HY Chen, R Chornock, HT Diehl, Z Doctor, A Drlica-Wagner, MR Drout, B Farr, DA Finley, RJ Foley, W Fong, DB Fox, J Frieman, J Garcia-Bellido, MSS Gill, RA Gruendl, K Herner, DE Holz, D Kasen, R Kessler, H Lin, R Margutti, J Marriner, T Matheson, BD Metzger, JEH Neilsen, E Quataert, A Rest, M Sako, D Scolnic, N Smith, F Sobreira, GM Strampelli, VA Villar, AR Walker, W Wester, PKG Williams, B Yanny, TMC Abbott, FB Abdalla, S Allam, R Armstrong, K Bechtol, A Benoit-Lévy, E Bertin, D Brooks, DL Burke, A Carnero Rosell, M Carrasco Kind, J Carretero, FJ Castander, CE Cunha, CB D’Andrea, LN da Costa, S Desai, JP Dietrich, AE Evrard, A Fausti Neto, P Fosalba, DW Gerdes, T Giannantonio, DA Goldstein, D Gruen, G Gutierrez, K Honscheid, DJ James, MWG Johnson, MD Johnson, E Krause, K Kuehn, N Kuropatkin, M Lima, MAG Maia, JL Marshall, F Menanteau, R Miquel, JJ Mohr, RC Nichol, B Nord, R Ogando, AA Plazas, K Reil, AK Romer, E Sanchez, V Scarpine, I Sevilla-Noarbe, RC Smith, E Suchyta, G Tarle, D Thomas, RC Thomas, DL Tucker, J Weller, DES Collaboration. “*A DECam Search for an Optical Counterpart to the LIGO Gravitational-wave Event GW151226.*” 2016, [ApJL 826 L29](#) [31].



10. BP Abbott, R Abbott, TD Abbott, MR Abernathy, F Acernese, K Ackley, C Adams, T Adams, P Addesso, RX Adhikari, **al.**. “*Supplement: Localization and Broadband Follow-up of the Gravitational-wave Transient GW150914 (2016, ApJL, 826, L13).*” 2016, [ApJS 225 8](#) [35].
9. BP Abbott, R Abbott, TD Abbott, MR Abernathy, F Acernese, K Ackley, C Adams, T Adams, P Addesso, RX Adhikari, **al.**. “*Localization and Broadband Follow-up of the Gravitational-wave Transient GW150914.*” 2016, [ApJL 826 L13](#) [172].
8. M Nicholl, E Berger, SJ Smartt, R Margutti, A Kamble, KD Alexander, T-W Chen, C Inserra, I Arcavi, PK Blanchard, R Cartier, KC Chambers, MJ Childress, R Chornock, **PS Cowperthwaite**, M Drout, HA Flewelling, M Fraser, A Gal-Yam, L Galbany, J Harmanen, TW-S Holoien, G Hosseinzadeh, DA Howell, ME Huber, A Jerkstrand, E Kankare, CS Kochanek, Z-Y Lin, R Lunnan, EA Magnier, K Maguire, C McCully, M McDonald, BD Metzger, D Milisavljevic, A Mitra, T Reynolds, J Saario, BJ Shappee, KW Smith, S Valenti, VA Villar, C Waters, DR Young. “*SN 2015BN: A Detailed Multi-wavelength View of a Nearby Superluminous Supernova.*” 2016, [ApJ 826 39](#) [56].
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5. **PS Cowperthwaite**, E Berger. “*A Comprehensive Study of Detectability and Contamination in Deep Rapid Optical Searches for Gravitational Wave Counterparts.*” 2015, [ApJ 814 25](#) [35].
4. **PS Cowperthwaite**, CS Reynolds. “*Nonlinear Dynamics of Accretion Disks with Stochastic Viscosity.*” 2014, [ApJ 791 126](#) [9].
3. F Massaro, M Giroletti, R D’Abrusco, N Masetti, A Paggi, **PS Cowperthwaite**, G Tosti, S Funk. “*The Low-frequency Radio Catalog of Flat-spectrum Sources.*” 2014, [ApJS 213 3](#) [19].

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1. **PS Cowperthwaite**, CS Reynolds. “*The Central Engine Structure of 3C120: Evidence for a Retrograde Black Hole or a Refilling Accretion Disk.*” 2012, [ApJL 752 L21](#) [23].



# Philip S. Cowperthwaite

## Presentations List

Updated Sep 10, 2018.

### Presentation — Talk

- 2018 Aug *TeVPA 2018, Berlin, Germany*  
An r-process Kilonova Associated with the Gravitational Wave Event GW170817
- 2018 June *Carnegie Tea Talk, Carnegie Observatories, Pasadena, CA*  
Prospects For GW-EM Astronomy In The Next Decade
- 2018 May *Fireman Prize Talk, Harvard, Cambridge, MA*  
From Design to Detection: Joint Gravitational Wave and Electromagnetic Astronomy
- 2018 May *Sackler Conference 2018: Gravitational Wave Astrophysics, Cambridge, MA*  
Panelist on Future of EM Follow-Up
- 2018 April *Harvard Public Thesis Defense, Harvard, Cambridge, MA*  
From Design to Detection: Joint Gravitational Wave and Electromagnetic Astronomy
- 2017 Dec *ITC Luncheon Talk, Harvard, Cambridge, MA*  
Local Cosmology with Gravitational Waves
- 2017 Nov *BHI Journal Club, Harvard, Cambridge, MA*  
GW170817: Light Curves and Modeling
- 2017 Nov *CosmoFest, Harvard, Cambridge, MA*  
Local Cosmology with Gravitational Waves
- 2017 Nov *High Energy Lunch Talk, Harvard, Cambridge, MA*  
An r-process Kilonova Associated with the Gravitational Wave Event GW170817
- 2017 Oct *Thunch Talk, Princeton, Princeton, NJ*  
GW170817: The Dawn of Joint Gravitational Wave and Electromagnetic Astronomy
- 2017 Oct *ITC Luncheon Talk, Harvard, Cambridge, MA*  
GW170817: Light Curves and Modeling
- 2017 Oct *Monday Tea Talk, Caltech, Pasadena, CA*  
GW170817: The First Joint Gravitational Wave and Electromagnetic Detection
- 2017 Oct *Lunch Talk, Carnegie Observatories, Pasadena, CA*  
Deep and Rapid Optical Follow-Up of GW Triggers with DECam
- 2017 Oct *Astrophysics Seminar, Fermilab, Batavia, IL*  
Deep and Rapid Optical Follow-Up of GW Triggers with DECam
- 2017 Sep *Theory Lunch, Northwestern University, Evanston, IL*  
Deep and Rapid Optical Follow-Up of GW Triggers with DECam
- 2017 Sep *CTC Theory Lunch, UMD, College Park, MD*  
Deep and Rapid Optical Follow-Up of GW Triggers with DECam
- 2017 Aug *INT Workshop and Conference, University of Washington, Seattle, WA*  
Deep and Rapid Optical Follow-Up of GW Triggers with DECam
- 2017 Aug *INT Workshop and Conference, University of Washington, Seattle, WA*  
Overview: EM Observations of Kilonovae
- 2016 Nov *Time-Domain Astronomy Workshop, Radcliffe Institute, Cambridge, MA*  
Deep and Rapid Optical Follow-Up of GW Triggers with DECam
- 2016 Jun *GWPAW Workshop 2016, Cape Code, MA*  
DECam Searches for Optical Counterparts to Gravitational Wave Events
- 2016 Apr *APS April Meeting 2016, Salt Lake City, UT*  
Identifying Electromagnetic Counterparts to Gravitational Wave Triggers With DECam
- 2015 Jun *GWPAW Workshop 2015, Osaka, Japan*  
A Comprehensive Study of Detectability and Contamination in Deep Rapid Optical Searches for Gravitational Wave Counterparts
- 2012 Aug *Summer REU Colloquium Series, Harvard-Smithsonian CfA, Cambridge, MA*  
The Spitzer View of WISE selected blazars

## Presentation — Poster

- 2015 Jun      *GWPAW Workshop 2015, Osaka, Japan*  
A Comprehensive Study of Detectability and Contamination in Deep Rapid Optical Searches for Gravitational Wave Counterparts
- 2013 Jan      *221st AAS Meeting, Long Beach, CA*  
Piercing the Continuum of WISE selected blazars
- 2012 Jun      *Energetic Astronomy, JSI Workshop, Annapolis MD*  
The Central Engine Structure of 3c120: Evidence for a Retrograde Black Hole or a Refilling Accretion Disk