

# THOMAS W.-S. HOLOIEN

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Carnegie Fellow

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## EDUCATION

2013–2017 **The Ohio State University**, Columbus, OH

Ph.D. in Astronomy, 2017

Thesis: *Stellar Death in the Nearby Universe*

Advisor: Professor Krzysztof Z. Stanek

M.S. in Astronomy, 2016

2011–2013 **Rutgers University**, New Brunswick, NJ

B.S. in Astrophysics with departmental Highest Honors, 2013

Graduated *summa cum laude*

2004–2008 **Stanford University**, Stanford, CA

B.A. in East Asian Studies (Japan), 2008

Minor in Computer Science

## ADDITIONAL RESEARCH EXPERIENCE

2016 **SLAC National Accelerator Laboratory**, Menlo Park, CA

DOE Computational Science Graduate Fellow

## FELLOWSHIPS AND AWARDS

2017 – now Carnegie Fellowship, Carnegie Observatories

2017 Allan Markowitz Award in Observational Astronomy, Ohio State University

2014 – 2017 Department of Energy Computational Science Graduate Fellowship

2014 NSF Graduate Research Fellowship Honorable Mention

2014 Hertz Foundation Graduate Fellowship Semi-Finalist

2013 Center for Cosmology and AstroParticle Physics Early Start Award

2013 University Fellowship for Graduate Studies, The Ohio State University

2013 SAS Excellence Award, Class of 1925 Scholarship, Rutgers University

## SELECTED PROPOSALS AND RESEARCH SUPPORT

- 2017      **Co-I:** “X-ray Spectroscopy of a TDE”  
Chandra X-ray Observatory, 400 ks in Cycle 19 (PI: C. S. Kochanek)
- 2017      **Co-I:** “Ultraviolet Spectroscopic Monitoring of a Tidal Disruption Event”  
Hubble Space Telescope, 22 orbits in Cycle 25 (PI: C. S. Kochanek)
- 2016      **Co-I:** “X-ray Spectroscopy of an ASAS-SN TDE”  
Chandra X-ray Observatory, 400 ks in Cycle 18 (PI: C. S. Kochanek)
- 2016      **Co-I:** “Ultraviolet Spectroscopic Monitoring of an ASAS-SN Tidal  
Disruption Event”  
Hubble Space Telescope, 22 orbits in Cycle 24 (PI: C. S. Kochanek)
- 2015      **Named Participant:** “All-Sky Automated Survey for Supernovae: Big  
Science with Small Telescopes”  
National Science Foundation Grant (AST-1515927, PI: K. Z. Stanek)
- 2015      **Co-I:** “Swift Follow-Up of the Most Interesting ASAS-SN Transients”  
Swift Space Telescope, 90 ks in Cycle 11 (PI: K. Z. Stanek)

## OBSERVING EXPERIENCE

- 7 nights as primary observer on the du Pont 100-inch telescope  
4 nights as primary observer on the Magellan Clay 6.5-m telescope  
30 nights (28 as primary observer) on the MDM Hiltner 2.4-m telescope  
13 nights (9 as primary observer) on the MDM McGraw-Hill 1.3-m telescope

## PROGRAMMING EXPERIENCE

- Authored open-source software currently being used to plant realistic supernovae in simulated LSST data (available on github): XDGMM, EmpiriciSN
- Programming languages: C++, C, Python
- Parallel computing: OpenMP, MPI, Cuda
- Automated data processing: image reduction/subtraction, transient detection

## SERVICE AND OUTREACH

- Volunteer, Carnegie Observatories Open House  
Co-leader, OSU Astronomy Department Breakfast of Science Champions  
Presenter, OSU Astronomy Department Planetarium  
Volunteer, OSU Astronomy Department Star Parties

## PROFESSIONAL ACTIVITIES

- 2018 – now Referee, *Nature Astronomy*
- 2017 – now Referee, *Monthly Notices of the Royal Astronomical Society*
- 2016 – now Member, LSST Dark Energy Science Collaboration
- 2015 – now Referee, *The Astrophysical Journal*
- 2013 – now Member, American Astronomical Society

## NON-ACADEMIC EMPLOYMENT

- 2008–2010 **Project Engineer**, iCIMS.com, Hazlet, NJ
- 2007–2008 **Editorial Intern**, Nintendo Power, Future US, South San Francisco, CA
- 2006–2007 **Editorial Intern**, PSM: Independent PlayStation Magazine, Future US, South San Francisco, CA

## PUBLICATIONS

**Summary:** 76 total, 12 first author, 7 with significant contribution, 56 with contribution; 1650+ citations

**Submitted (9 total, 2 first author)**

9. *The ASAS-SN Bright Supernova Catalog – IV. 2018*  
**Holoien, T. W.-S.** et al. 2018, Submitted to *MNRAS*  
arXiv:1811.08904
8. *PS18kh: A New Tidal Disruption Event with a Non-Axisymmetric Accretion Disk*  
**Holoien, T. W.-S.** et al. 2018, Submitted to *ApJ*  
arXiv:1808.02890
7. *The Extraplanar Type II Supernova ASASSN-14jb in the Nearby Edge-on Galaxy ESO 467-G051*  
Meza, N. et al. 2018, Submitted to *A&A*  
arXiv:1811.11771
6. *The Relative Specific Type Ia Supernova Rate from Three Years of ASAS-SN*  
Brown, J. S., Stanek, K. Z., **Holoien, T. W.-S.** et al. 2018, Submitted to *MNRAS*  
arXiv:1810.00011
5. *First Resolution of Microlensed Images*  
Dong, S. et al. 2018, Submitted to *ApJ*  
arXiv:1809.08243
4. *The ASAS-SN Catalog of Variable Stars II: Uniform Classification of 412,000 Known Variables*  
Jayasinghe, T. et al. 2018, Submitted to *MNRAS*  
arXiv:1809.07329
3. *The Largest M Dwarfs Flares from ASAS-SN*  
Schmidt, S. J. et al. 2018, Submitted to *ApJ*  
arXiv:1809.04510
2. *An All-Sky Search for R Coronae Borealis Stars in ASAS-SN*  
Shields, J. V. et al. 2018, Submitted to *MNRAS*  
arXiv:1809.04075

1. *Discovery of an Extraordinary Binary System*  
Thompson, T. A. et al. 2018, Submitted to *Science*  
arXiv:1806.02751

**Accepted/Published (67 total, 10 first author)**

67. *The Unusual Late-Time Evolution of the Tidal Disruption Event ASASSN-15oi*  
**Holoien, T. W.-S.** et al. 2018, *MNRAS*, 480, 5689
66. *The ASAS-SN Bright Supernova Catalog – III. 2016*  
**Holoien, T. W.-S.** et al. 2017, *MNRAS*, 471, 4966
65. *EmpiriciSN: Re-Sampling Observed Supernova/Host Galaxy Populations Using an XD Gaussian Mixture Model*  
**Holoien, T. W.-S.**, Marshall, P. J., & Wechsler, R. H. 2017, *AJ*, 153, 249
64. *The ASAS-SN Bright Supernova Catalog – II. 2015*  
**Holoien, T. W.-S.** et al. 2017, *MNRAS*, 466, 4904
63. *The ASAS-SN Bright Supernova Catalog – I. 2013-2014*  
**Holoien, T. W.-S.** et al. 2017, *MNRAS*, 464, 2672
62. *ASASSN-15oi: A Rapidly Evolving, Luminous Tidal Disruption Event at 216 Mpc*  
**Holoien, T. W.-S.** et al. 2016, *MNRAS*, 463, 3813
61. *Discovery and Observations of the Unusually Luminous Type-Defying Type II-P/II-L Supernova ASASSN-13co*  
**Holoien, T. W.-S.** et al. 2016, *Acta Astronomica*, 66, 219
60. *Six Months of Multi-Wavelength Follow-up of the Tidal Disruption Candidate ASASSN-14li and Implied TDE Rates from ASAS-SN*  
**Holoien, T. W.-S.** et al. 2016, *MNRAS*, 455, 2918
59. *ASASSN-14ae: A Tidal Disruption Event at 200 Mpc*  
**Holoien, T. W.-S.** et al. 2014, *MNRAS*, 445, 3263
58. *Discovery and Observations of ASASSN-13db, an EX Lupi-Type Accretion Event on a Low-Mass T Tauri Star*  
**Holoien, T. W.-S.** et al. 2014, *ApJL*, 785L, 35
57. *Seeing Double: ASASSN-18bt Exhibits a Double-Power-Law Rise in the Early-time K2 Light Curve*  
Shappee, B. J., **Holoien, T. W.-S.** et al. 2018, Accepted in *ApJ*

56. *Velocity-Resolved Reverberation Mapping of Five Bright Seyfert I Galaxies*  
De Rosa, G. et al. 2018, Accepted in *ApJ*
55. *ASASSN-18ey: The Rise of a New Black Hole X-ray Binary*  
Tucker, M. A., Shappee, B. J., **Holoien, T. W.-S.** et al. 2018, Accepted in *ApJL*
54. *Photometric and Spectroscopic Properties of Type Ia Supernova 2018oh with Early Excess Emission from the Kepler 2 Observations*  
Li, W. et al. 2018, Accepted in *ApJ*
53. *The Cow: Discovery of a Luminous, Hot, Rapidly Evolving Transient*  
Prentice, S. J. et al. 2018, *ApJL*, 865L, 3
52. *Red Versus Blue: Early Observations of Thermonuclear Supernovae Reveal Two Distinct Populations?*  
Stritzinger, M. D. et al. 2018, *ApJL*, 864L, 35
51. *ASASSN-15nx: A Luminous Type II Supernova with a “Perfect” Linear Decline*  
Bose, S. et al. 2018, *ApJ*, 862, 107
50. *Multimessenger Observations of a Flaring Blazar Coincident with High-Energy Neutrino IceCube-170922A*  
IceCube Collaboration et al. 2018, *Science*, 361, 1378
49. *ASAS-SN Identification of FY Sct as a Detached Eclipsing Binary System with a 2.6 Years Period*  
Jayasinghe, T. et al. 2018, *RNAAS*, 2c, 181
48. *ASAS-SN Identification of a Detached Eclipsing Binary System with a  $\sim 7.3$  Year Period*  
Jayasinghe, T. et al. 2018, *RNAAS*, 2c, 125
47. *A Significantly Off-Center  $^{56}\text{Ni}$  Distribution for the Low-Luminosity Type Ia Supernova SN 2016brx from the 100IAS Survey*  
Dong, S. et al. 2018, *MNRAS*, 479L, 70
46. *The ASAS-SN Catalogue of Variable Stars I: The Serendipitous Survey*  
Jayasinghe, T. et al. 2018, *MNRAS*, 477, 3145
45. *ASASSN-18di: Discovery of a Powerful Flare on a Mid-M Dwarf*  
Rodriguez, R. et al. 2018, *RNAAS*, 2b, 8
44. *The Highly Luminous Type Ibn Supernova ASASSN-14ms*  
Vallely, P. J. et al. 2018, *MNRAS*, 475, 2344

43. *Continuum Reverberation Mapping of the Accretion Disks in Two Seyfert 1 Galaxies*  
Fausnaugh, M. M. et al. 2018, *ApJ*, 854, 107
42. *ASAS-SN Discovery of 4880 Bright RR Lyrae Variable Stars*  
Jayasinghe, T. et al. 2018, *RNAAS*, 2a, 18
41. *Where is the Flux Going? The Long-Term Photometric Variability of Boyajian's Star*  
Simon, J. D. et al. 2018, *ApJ*, 853, 77
40. *Gaia17biu/SN 2017egm in NGC 3191: The Closest Hydrogen-poor Superluminous Supernova to Date is in a "Normal", Massive, Metal-rich Spiral Galaxy*  
Bose, S. et al. 2018, *ApJ*, 853, 57
39. *Supernovae 2016bdu and 2005gl, and Their Link with SN 2009ip-like Transients: Another Piece of the Puzzle*  
Pastorello, A. et al. 2018, *MNRAS*, 474, 197
38. *The Ultraviolet Spectroscopic Evolution of the Low-Luminosity Tidal Disruption Event iPTF16fnl*  
Brown, J. S., Kochanek, C. S., **Holoien, T. W.-S.** et al. 2018, *MNRAS*, 473, 1130
37. *The Architecture of the GW Ori Young Triple Star System and Its Disk: Dynamical Masses, Mutual Inclinations, and Recurrent Eclipses*  
Czekala, I. et al. 2017, *ApJ*, 851, 132
36. *Early Spectra of the Gravitational Wave Source GW170817: Evolution of a Neutron Star Merger*  
Shappee, B. J. et al. 2017, *Science*, 358 1574
35. *Light Curves of the Neutron Star Merger GW170817/SSS17a: Implications for R-Process Nucleosynthesis*  
Drout, M. R. et al. 2017, *Science*, 358, 1570
34. *Energetic Eruptions Leading to a Peculiar Hydrogen-Rich Explosion of a Massive Star*  
Arcavi, I. et al. 2017, *Nature*, 551, 210
33. *The Rise and Peak of the Luminous Type II<sub>n</sub> SN 2017hcc/ATLAS17lsn from ASAS-SN and Swift UVOT Data*  
Prieto, J. L. et al. 2017, *RNAAS*, 1a, 28

32. *The All-Sky Automated Survey for Supernovae (ASAS-SN) Light Curve Server v1.0*  
Kochanek, C. S. et al. 2017, *PASP*, 129, 4502
31. *Space Telescope and Optical Reverberation Mapping Project. VII. Understanding the UV Anomaly in NGC 5548 with X-ray Spectroscopy*  
Mathur, S. et al. 2017, *ApJ*, 846, 55
30. *Survey of Period Variations of Superhumps in SU UMa-Type Dwarf Novae. IX: The Ninth Year (2016-2017)*  
Kato, T. et al. 2017, *PASJ*, 69, 75
29. *A Nova Outburst Powered by Shocks*  
Li, K. et al. 2017, *Nature Astronomy*, 1, 697
28. *Long-term Photometric Variations in the Candidate White-Dwarf Pulsar AR Scorpii from K2, CRTS, and ASAS-SN Observations*  
Littlefield, C. et al. 2017, *ApJL*, 845L, 7
27. *The 2014-2017 Outburst of the Young Star ASASSN-13db: A Time-Resolved Picture of A Very Low-Mass Star between EXors and FUors*  
Sicilia-Aguilar, A. et al. 2017, *A&A*, 607, 127
26. *Multiwavelength Follow-up of a Rare IceCube Neutrino Multiplet*  
Aartsen, M. G. et al. 2017, *A&A*, 607, 115
25. *Periodic Eclipses of the Young Star PDS 110 Discovered with WASP and KELT Photometry*  
Osborn, H. P. et al. 2017, *MNRAS*, 471, 740
24. *Reverberation Mapping of Optical Emission Lines in Five Active Galaxies*  
Fausnaugh, M. M. et al. 2017, *ApJ*, 840, 97
23. *Space Telescope and Optical Reverberation Mapping Project. V. Optical Spectroscopic Campaign and Emission-Line Analysis for NGC 5548*  
Pei, L. et al. 2017, *ApJ*, 837, 131
22. *The Mysterious Dimmings of the T Tauri Star V1334 Tau*  
Rodriguez, J. E. et al. 2017, *ApJ*, 836, 209
21. *Placing the Spotted T Tauri Star LKCA 4 on an HR Diagram*  
Gully-Santiago, M. A. et al. 2017, *ApJ*, 836, 200



20. *Supernova Progenitors, Their Variability, and the Type IIP Supernova ASASSN-16fq in M66*  
Kochanek, C. S. et al. 2017, *MNRAS*, 467, 3347
19. *The Long-Term Evolution of ASASSN-14li*  
Brown, J. S., **Holoien, T. W.-S.** et al. 2017, *MNRAS*, 466, 4904
18. *The Unexpected, Long-Lasting, UV Rebrightening of the Super-Luminous Supernova ASASSN-15lh*  
Godoy-Rivera, D. et al. 2017, *MNRAS*, 466, 1428
17. *The TDE ASASSN-14li and its Host Resolved at Parsec Scales with the EVN*  
Romero-Cañizales, C. et al. 2016, *ApJL*, 832L, 10
16. *Return of the King: Time-Series Photometry of FO Aquarii's Initial Recovery from its Unprecedented 2016 Low State*  
Littlefield, C. et al. 2016, *ApJ*, 833, 93
15. *MUSE Reveals a Recent Merger in the Post-starburst Host Galaxy of the TDE ASASSN-14li*  
Prieto, J. L. et al. 2016, *ApJL*, 830L, 74
14. *The Eruption of the Candidate Young Star ASASSN-15qi*  
Herczeg, G. J. et al. 2016, *ApJ*, 831, 133
13. *DM Ori: A Young Star Occulted by a Disturbance in its Protoplanetary Disk*  
Rodriguez, J. E. et al. 2016, *ApJ*, 831, 74
12. *Hello Darkness My Old Friend: The Fading of the Nearby TDE ASASSN-14ae*  
Brown, J. S., Shappee, B. J., **Holoien, T. W.-S.** et al. 2016, *MNRAS*, 462, 3993
11. *ASASSN-16ae: A Powerful White-Light Flare on an Early-L Dwarf*  
Schmidt, S. J. et al. 2016, *ApJL*, 828L, 22
10. *The Young and Bright Type Ia Supernova ASASSN-14lp: Discovery, Early-time Observations, First-light Time, Distance to NGC 4666, and Progenitor Constraints*  
Shappee, B. J., Piro, A. L., **Holoien, T. W.-S.** et al. 2016, *ApJ*, 826, 144
9. *SN 2015bn: A Detailed, Multi-Wavelength View of a Nearby Superluminous Supernova*  
Nicholl, M. et al. 2016, *ApJ*, 826, 39
8. *ASASSN-15lh: A Highly Super-Luminous Supernova*  
Dong, S. et al. 2016, *Science*, 351, 257

7. *Gamma-Rays from the Quasar PKS 1441+25: Story of an Escape*  
Abeyssekara, A. U. et al. 2015, *ApJL*, 815L, 22
6. *Massive Stars Exploding in a He-rich Circumstellar Medium – VII. The Metamorphosis of ASASSN-15ed from a Narrow Line Type Ib to a Normal Type Ib Supernova*  
Pastorello, A. et al. 2015, *MNRAS*, 453, 3649
5. *Total Eclipse of the Heart: The AM CVn Gaia14aae/ASASSN-14cn*  
Campbell, H. C. et al. 2015, *MNRAS*, 452, 1060
4. *The Man Behind the Curtain: X-rays Drive the UV through NIR Variability in the 2013 AGN Outburst in NGC 2617*  
Shappee, B. J. et al. 2014, *ApJ*, 788, 48
3. *Three Gravitationally Lensed Supernovae Behind CLASH Galaxy Clusters*  
Patel, B. et al. 2014, *ApJ*, 786, 9
2. *Type Ia Supernova Rates to Redshift 2.4 from CLASH: the Cluster Lensing And Supernova survey with Hubble*  
Graur, O. et al. 2014, *ApJ*, 783, 28
1. *Characterizing a Dramatic  $\Delta V \sim -9$  Flare on an Ultracool Dwarf Found by the ASAS-SN Survey*  
Schmidt, S. J. et al. 2014, *ApJL*, 781L, 24

## Circulars and Telegrams

670+ Astronomer's Telegrams (60+ first author) with 400+ citations

## CONFERENCE PROCEEDINGS AND TALKS

15. *An ASAS-SN Update*  
**Holoien, T. W.-S.** Talk presented at Swift Time Domain Astronomy III, Clemson, SC (2018, Oct.)
14. *Insights from ASAS-SN*  
**Holoien, T. W.-S.** Talk presented at Using Tidal Disruption Events to Study Super-Massive Black Holes, Aspen, CO (2018, Jan.)
13. *Recent Supernova and Tidal Disruption Event Results from ASAS-SN*  
**Holoien, T. W.-S.** Poster presented at Deciphering the Violent Universe, Playa del Carmen, Mexico (2017, Dec.)

12. *Late-Time Follow-up of ASAS-SN Tidal Disruption Events*  
**Holoien, T. W.-S.** Talk presented at TDE17: Piercing the Sphere of Influence, Cambridge, United Kingdom (2017, Sep.)
11. *Extragalactic Transients Discovered by the All-Sky Automated Survey for Supernovae*  
Brown, J. S. and **Holoien, T. W.-S.**, on behalf of the ASAS-SN Team. Poster presented at AAS 229, Grapevine, TX (2017, Jan.)
10. *Late-Time Follow-up of ASAS-SN Tidal Disruption Events*  
**Holoien, T. W.-S.** Thesis talk presented at AAS 229, Grapevine, TX (2017, Jan.)
9. *ASAS-SN: Big Science with Small Telescopes*  
**Holoien, T. W.-S.** and the ASAS-SN Team. Poster presented at the 2016 DOE CSGF Annual Program Review, Arlington, VA (2016, July)
8. *ASAS-SN: Big Science with Small Telescopes*  
**Holoien, T. W.-S.** Tea Talk presented at the Kavli Institute for Particle Astrophysics and Cosmology, Stanford, CA (2016, July)
7. *The Best and Brightest: Tidal Disruption Events Discovered by ASAS-SN*  
**Holoien, T. W.-S.** Talk presented at AAS 227, Kissimmee, FL (2016, Jan.)
6. *Extragalactic Transients Discovered by the All-Sky Automated Survey for Supernovae*  
Brown, J. S. and **Holoien, T. W.-S.**, on behalf of the ASAS-SN Team. Poster presented at AAS 227, Kissimmee, FL (2016, Jan.)
5. *The Best and Brightest: Tidal Disruption Events Discovered by ASAS-SN*  
**Holoien, T. W.-S.** Talk presented at the Jerusalem TDE Workshop, Jerusalem, Israel (2015, Nov.)
4. *Two Years of Discoveries from the All-Sky Automated Survey for Supernovae*  
**Holoien, T. W.-S.** and the ASAS-SN Team. Poster presented at the 2015 DOE CSGF Annual Program Review, Arlington, VA (2015, July)
3. *Extragalactic Transients Discovered by the All-Sky Automated Survey for Supernovae*  
**Holoien, T. W.-S.**, Kochanek, C. S., Stanek, K. Z., Prieto, J. L., Shappee, B. J., and the ASAS-SN Team. Poster presented at AAS 225, Seattle, WA (2015, Jan.)
2. *HST and Ground Based Observations of 7 High Redshift Type Ia Supernovae*  
**Holoien, T. W.-S.**, McCully, C., and Jha, S. W. Poster presented at AAS 221, Long Beach, CA (2013, Jan.)

1. *Hubble Space Telescope Observations of High Redshift Supernovae from CLASH*  
Patel, B., McCully, C., **Holoien, T.**, Jha, S. W., Graur, O., Rodney, S. A., Reiss, A. G., on behalf of the CLASH team. Poster presented at AAS 221, Long Beach, CA (2013, Jan.)

## PRESS RELEASES

4. *Newly Discovered Supernova Complicates Origin Story Theories*  
The Observatories of the Carnegie Institution for Science (2018).  
<https://carnegiescience.edu/news/newly-discovered-supernova-complicates-origin-story-theories>
3. *Kepler's Supernova Experiment Captures First Moments of a Dying Star*  
NASA (2018).  
<https://www.nasa.gov/feature/ames/kepler-s-supernova-experiment-captures-first-moments-of-a-dying-star>
2. *"Assassin" Targets Supernovae in Our Neighborhood of the Universe*  
The Ohio State University (2015).  
<https://news.osu.edu/news/2015/01/08/assassin-targets-supernovae/>
1. *Lucky Star Escapes Black Hole with Minor Damage*  
The Ohio State University (2014).  
<https://news.osu.edu/news/2014/10/23/lucky-star-escapes-black-hole-with-minor-damage/>

## REFERENCES

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