

P. WILSON CAULEY

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Laboratory of Atmospheric and Space Physics

University of Colorado Boulder ◊ Boulder, CO 80309

EDUCATION

PhD in Astronomy, Rice University

August 2014

Dissertation: “Diagnosing mass flows in Herbig Ae/Be stars”

Advisor: Dr. Christopher Johns-Krull

MS in Astronomy, Rice University

February 2012

Thesis: “Testing disk-locking in NGC 2264”

Advisor: Dr. Christopher Johns-Krull

Wake Forest University

May 2009

BS in Physics, magna cum laude

BA in Mathematics

PROFESSIONAL EXPERIENCE

University of Colorado Boulder

August 2018 - Present

Postdoctoral researcher

Boulder, CO

- Post-doc with Professor Kevin France studying exoplanet transmission spectra and warm molecular layers in protoplanetary disks

Arizona State University

September 2017 - August 2018

Postdoctoral researcher

Tempe, AZ

- Post-doc with Professor Evgenya Shkolnik studying star-planet interactions and exoplanet transmission spectra

Wesleyan University

September 2014 - September 2017

Postdoctoral researcher

Middletown, CT

- Post-doc with Associate Professor Seth Redfield working on characterizing exoplanet atmospheres and star-planet interactions using high-resolution spectroscopy

Rice University

August 2009 - August 2014

Research and teaching assistant

Houston, TX

- Graduate student with Professors Christopher Johns-Krull and Patrick Hartigan working on spectroscopic properties of accretion and outflow processes around Herbig Ae/Be stars and classical T Tauri stars, as well as wide-field, short-cadence photometry of the Carina Nebula
- Teaching assistant for five semesters of introductory and intermediate astronomical observation labs, responsible for helping students learn basic telescope and CCD camera operation, as well as basic observational techniques

Wake Forest University

June 2007 - May 2009

Research assistant

Winston-Salem, NC

- Undergraduate research assistant to Professor Paul Anderson working on numerical calculations of stress-energy tensors in Reissner-Nordstrom and Kerr spacetimes

SERVICE

NASA panel reviewer	<i>July 2018</i>
<i>HST</i> mid-cycle proposal reviewer	<i>April 2018</i>
Tristate post-doc retreat 2017 - webmaster and meeting organizer	<i>October 2016 - March 2017</i>
Wesleyan Diversity Journal Club - active participant and presenter	<i>August 2015 - August 2017</i>
Conference for Undergraduate Women in Physics - 2016 meeting volunteer	<i>January 2016</i>
Anti-Racism in Astronomy Group (AARG) - 2015 meeting participant	<i>July 2015</i>
Rice University - Public night assistant	<i>January 2010 - August 2014</i>
Scientific referee - Astronomy & Astrophysics, The Astronomical Journal, The Astrophysical Journal, MNRAS	<i>2014-Present</i>
Chambliss award poster judge - AAS winter meeting undergraduate poster judge	<i>Jan. 2013, 2015, 2016</i>

EDUCATION AND OUTREACH

Adopt-a-Physicist program - Interact via a forum with students to help them understand scientific methods and what it's like to be a scientist	<i>Fall 2017</i>
Essex Library Association - Public speaker	<i>March, June 2017</i>
Rice University - Co-advisor for senior thesis of Sharad Jones ('14)	<i>August 2013 - May 2014</i>
Wesleyan University - Public night and kids' night host	<i>January 2015 - August 2017</i>
Rice University - Public night assistant	<i>January 2010 - August 2014</i>
Astronomy on Tap New Haven - Public presentation about planetary magnetic fields	<i>June 2015</i>
General tutor, Old School After School Care	<i>September 2011 - June 2014</i>
McDonald Observatory - Public night speaker	<i>September 2012</i>
Wake Forest University - Homework help for general physics courses	<i>September 2007 - May 2009</i>

AWARDS AND RECOGNITION

- William F. Marlar scholar - Rice University, departmental monetary award for excellence in space science and astronomy research (2013)
- Eric Umland Memorial award - Rice University, departmental monetary award to the graduate most invested in improving the lives of graduate students in the department (2011,2012)
- Chambliss Astronomy Achievement award (graduate student)- 212th meeting of the AAS for the poster presentation *Testing Disk-Locking in NGC 2264*
- Wake Forest undergraduate summer research fellowship - Monetary stipend provided for students to perform a summer research project

OBSERVING TIME AWARDED

McDonald Observatory - PI, 2.7m, 7 nights	<i>September 2011</i>
McDonald Observatory - PI, 2.7m, 3 nights	<i>January 2013</i>
Gemini North - PI, 7 hours	<i>Decemeber 2012</i>
KPNO - PI, 4m, 5 nights	<i>March 2013</i>
Keck Observatory - PI (NASA Keck), 1 night	<i>August 2015</i>
WIYN Observatory - PI (NASA WIYN), 4 nights	<i>Sept. 2015</i>
McDonald Observatory - PI, 2.7m, 6 nights	<i>July, Sept. 2016</i>
WIYN Observatory - PI (NASA WIYN), 4 nights	<i>Jan.-Feb. 2016</i>
Keck Observatory - PI (NASA Keck), 1 night	<i>January 2017</i>
McDonald Observatory - PI, 2.7m, 3 nights	<i>August 2017</i>
Gemini North - PI, 4 hours	<i>December 2017</i>
WIYN Observatory - PI (NASA WIYN), 5 nights	<i>December 2017</i>

LBT Observatory - PI (AZ partner time), 1 night
Magellan - PI (AZ partner time), 1 night
LBT Observatory - PI (AZ partner time), 1 night
IRTF Observatory - PI, 1 night

January 2018
January 2018
December 2018
August 2018

FIRST-AUTHOR PUBLICATIONS

1. *Relative exoplanet magnetic field strengths from flux-calibrated star-planet interactions*, **P. W. Cauley**, E. L. Shkolnik, J. Llama, & A. F. Lanza 2019, in prep
2. *Atmospheric dynamics and the variable transit of KELT-9 b*, **P. W. Cauley**, E. L. Shkolnik, K. Strassmeier, I. Ilyin, S. Redfield, & A. Jensen, submitted to AAS journals
3. *Evidence of magnetic star-planet interactions in the HD 189733 system from orbitally-phased Ca II K variations*, **P. W. Cauley**, E. L. Shkolnik, J. Llama, V. Bourrier, & C. Moutou, accepted to AAS journals
4. *The effects of stellar activity on optical high-resolution exoplanet transmission spectra*, **P. W. Cauley**, C. Kuckein, S. Redfield, E. L. Shkolnik, C. Denker, J. Llama, & M. Verma 2018, AJ, 156, 5
5. *Transit time derivation for hot planet bow-shocks*, **P. W. Cauley**, E. L. Shkolnik, & J. Llama 2018, RNAAS, 2, 23
6. *Evidence for eccentric, precessing gaseous debris in the circumstellar absorption towards WD 1145+017*, **P. W. Cauley**, J. Farihi, S. Redfield, S. Bachman, S. Parsons, & B. Gänsicke 2018, ApJL, 852, 22
7. *Evidence for abnormal H α variability during near-transit observations of HD 189733 b*, **P. W. Cauley**, S. Redfield, and A. G. Jensen 2017, AJ, 153, 185
8. *A decade of H α transits for HD 189733 B: stellar activity versus absorption in the extended atmosphere*, **P. W. Cauley**, S. Redfield, & A. G. Jensen 2017, AJ, 153, 217
9. *A search for H α absorption around GJ 436 b and KELT-3 b*, **P. W. Cauley**, S. Redfield, & A. G. Jensen 2017, AJ, 153, 2
10. *Variability in the pre-transit signature around HD 189733 b*, **P. W. Cauley**, S. Redfield, Adam G. Jensen, & Travis Barman 2016, AJ, 152, 20
11. *Investigating the origin of hot gas lines in Herbig Ae/Be stars*, **P. W. Cauley** & C. M. Johns-Krull 2016, ApJ, 825, 147
12. *Optical hydrogen absorption consistent with a bow-shock around the hot Jupiter HD 189733b*, **P. W. Cauley**, S. Redfield, A. G. Jensen, T. Barman, M. Endl, & W. Cochran 2015, ApJ, 810, 13
13. *Optical mass flow diagnostics in Herbig Ae/Be stars*, **P. W. Cauley** & C. M. Johns-Krull 2015, ApJ, 810, 5
14. *Diagnosing mass flows around Herbig Ae/Be stars using the He I λ 10830 line*, **P. W. Cauley** & C. M. Johns-Krull 2014, ApJ, 797, 112
15. *Testing disk-locking in NGC 2264*, **P. W. Cauley**, C. M. Johns-Krull, C. M. Hamilton, & K. Lockhart 2012, ApJ, 756, 68

CO-AUTHOR REFEREED PUBLICATIONS

1. *Black hole remnants may exist if Starobinsky inflation occurred*, P. Anderson, M. J. Binkley, J. M. Bjerke, & **P. W. Cauley** 2018, submitted to Phys. Rev. D

2. *Hydrogen and sodium absorption in the optical transmission spectrum of WASP-12 b*, A. G. Jensen, **P. W. Cauley**, et al. 2018, AJ, 156, 154
3. *Dust production and depletion in evolved planetary systems*, J. Farihi, R. van Lieshout, **P. W. Cauley**, et al. 2018, MNRAS, 481, 2601
4. *K2-155: A Bright Metal-Poor M Dwarf with Three Transiting Super-Earths*, T. Hirano, F. Dai, J. H. Livingston, +11 co-authors, **P. W. Cauley**, et al. 2018, AJ, 155, 124
5. *Multi-wavelength observations of the EUV variable metal-rich white dwarf GD 394*, D. J. Wilson B. T. Gänsicke, D. Koester, S. P. Preval, J. Holberg, M. A. Barstow, C. Belardi, M. R. Burleigh, S. L. Caswell, **P. W. Cauley**, et al. 2018, under review at MNRAS
6. *Linking signatures of accretion with magnetic field measurements - Line profiles are not significantly different in magnetic and non-magnetic Herbig Ae/Be stars*, M. Reiter, N. Calvet, T. Thanithibodee, S. Kraus, **P. W. Cauley**, et al. 2018, ApJ, 852, 5
7. *Three super-Earths transiting the nearby star GJ 9827*, P. Niraula, S. Redfield, F. Dai, O. Barragan, D. Gandolfi, **P. W. Cauley**, et al. 2017, AJ, 154, 266
8. *Magnetism, X-rays, and Accretion Rates in WD 1145+017 and other Polluted White Dwarf Systems*, J. Farihi, L. Fossati, P. J. Wheatley, B. D. Metzger, J. Mauerhan, S. Bachman, B. T. Gänsicke, S. Redfield, **P. W. Cauley**, et al. 2018, MNRAS, 474, 947
9. *Untangling the near-IR spectral features in the protoplanetary environment of KH 15D*, N. A. Arulanantham, W. Herbst, M. S. Gilmore, **P. W. Cauley**, & S. K. Leggett 2017, ApJ, 834, 119
10. *Spectroscopic evolution of disintegrating planetesimals: minutes to months variability in the circumstellar gas associate with WD 1145+017*, S. Redfield, J. Farihi, **P. W. Cauley**, S. G. Parsons, B. T. Gänsicke, and G. Duvvuri 2017, ApJ, 839,42
11. *A Candidate Young Massive Planet in Orbit around the Classical T Tauri Star CI Tau*, C. M. Johns-Krull, J. N. McLane, L. Prato, C. J. Crockett, D. T. Jaffe, P. M. Hartigan, C. A. Beichman, N. I. Mahmud, W. Chen, B. A. Skiff, **P. W. Cauley**, J. A. Jones, G. N. Mace, 2016, ApJ, 826, 206

TALKS AND CONFERENCE PRESENTATIONS

- Wake Forest University colloquium, April 2018 - Talk, *A multi-pronged observational approach to measuring exoplanet magnetic fields*
- New Mexico State University colloquium, March 2018 - Talk, *Multi-pronged investigations in exoplanet magnetic fields*
- Lowell Observatory colloquium, February 2018 - Talk, *Multi-pronged investigations into exoplanet magnetic fields*
- Know Thy Star, Know Thy Planet, October 2017 - Poster, *Transmission spectra and the contrast effect for transiting exoplanets*
- 229th Meeting of the AAS, January 2017 - Talk, *Exploring the contrast effect in strong atomic lines*
- Harvard Small Scale Seminar, March 2016 - Talk, *Pre-transit absorption around the hot Jupiter HD 189733 b*
- Space Science Institute Tele-con, January 2016 - Talk, *Pre-transit signatures around hot planets: probing the circumplanetary material*
- 227th Meeting of the AAS, January 2016 - Poster, *Variability in the pre-transit signal of HD 189733 b*

- Yale YCAA Seminar, November 2015 - Talk, *The cart before the horse: pre-transit absorption signatures around hot planets*
- XXIX General Assembly of the IAU, August 2015 - Contributed talk, *Optical hydrogen absorption consistent with a bow-shock around the hot Jupiter HD 189733b*
- 1st Annual ERES meeting, May 2015 - Poster, *Optical hydrogen absorption consistent with a bow-shock around the hot Jupiter HD 189733b*
- 225th Meeting of the AAS, January 2015 - Dissertation talk, *Diagnosing mass flows in Herbig Ae/Be stars using the He I $\lambda 10830$ line*
- 221th Meeting of the AAS, January 2013 - Poster, *Unveiling and dereddening classical T Tauri stars using simultaneous UV and optical spectra*
- 219th Meeting of the AAS, January 2012 - Poster, *Testing disk-locking in NGC 2264*

RESEARCH AND TRAVEL AWARDS

- NASA WIYN PI award, *Magnetic star-planet interactions in HAT-P-11 and WASP-69*, \$13,400
- NASA Keck PI award, *Measuring the extended atmosphere of the hot super-Earth 55 Cnc e*, \$15,000
- NASA WIYN PI award, *Measuring pre-transit absorption around the hot planets GJ 436 b and KELT-3 b*, \$11,600
- NASA WIYN PI award, *Searching for pre-transit hydrogen absorption around hot planets*, \$22,000
- NASA Keck PI award, *Comprehensive pre-transit hydrogen absorption around HD 189733 b: Estimating the planetary magnetic field strength*, \$13,000