

Erin M. May

Johns Hopkins Applied Physics Laboratory • Erin.May@jhuapl.edu • www.ErinMMay.com

Using 3D circulation models and ground- and space- based observations, I am interested in the characterization and classification of exoplanets and their atmospheres with uniform analysis methods.

Relevant Employment

Johns Hopkins Applied Physics Laboratory <i>Postdoctoral Fellow</i>	October 2019 – Present
Space Telescope Science Institute <i>Postdoctoral Researcher with the STARGATE group</i>	July 2019 – October 2019

Education

PhD in Astronomy and Astrophysics <i>University of Michigan, Department of Astronomy</i> <i>Advisor: Emily Rauscher</i> <i>Thesis: The Atmospheres of the Smallest Gas Exoplanets</i>	2019
B.S in Astrophysics and Advanced Mathematics <i>Michigan State University, Department of Physics & Astronomy, Department of Mathematics</i>	2014

Publications in Astronomy

Refereed First Author (* = student advised)

- (7) **E. M. May** & T. Komacek, et al. “*Spitzer phase curve observations and circulation models of the inflated ultra-hot Jupiter WASP-76b*” (Accepted to AJ, arXiv:2107.03349)
- (6) **E. M. May**, J. Taylor, T. D. Komacek, M. R. Line, V. Parmentier, “*Water Ice Cloud Variability & Multi-Epoch Transmission Spectra of TRAPPIST-1e*”, *ApJL*, 911, L30
- (5) **E. M. May** & K. B. Stevenson, “*Introducing a New Spitzer Master BLISS Map to Remove the Instrument Systematic -- Phase Curve Parameter Degeneracy, as Demonstrated by a Reanalysis of the 4.5 micron WASP-43b Phase Curve*”, *AJ* 160 140 (2020c)
- (4) **E. M. May** & E. Rauscher, “*The Effects of a Surface on Atmospheric Circulation and Emission for 1.5R_⊕ Planets*”, *ApJ* 893 161 (2020b)
- (3) **E. M. May**, T. Gardner, E. Rauscher, & J. D. Monnier, “*MOPSS II: Extreme Optical Scattering Slope for the Inflated Super-Neptune HATS-8b*”, *AJ* 159 7 (2020a)
- (2) **E. M. May**, M. Zhao, M. Haidar*, E. Rauscher, & J. D. Monnier, “*MOPSS I: Flat Optical Spectra for the Hot Jupiters WASP-4b and WASP-52b*”, *AJ* 156 122 (2018)
- (1) **E. M. May** & E. Rauscher, “*Examining Tatooine: Atmospheric Models of Circumbinary Planets*” *ApJ* 826, 225 (2016)

Refereed Nth Author

- (7) G. Fu, D. Demin, **E. M. May**, et al. “*The Hubble PanCET program: Transit and Eclipse Spectroscopy of the Hot Jupiter WASP-74b*” (accepted to AJ, arXiv:2110.04415)
- (6) J. Lustig-Yaeger, et al. (including **E. M. May**) “*Retrieving Exoplanet Atmospheres using Planetary Infrared Excess: Prospects for the Nightside of WASP-43b and other Hot Jupiters*” (accepted to ApJL, arXiv: 2110.02247)
- (5) L. Corrales, et al. (including **E. M. May**) “*Five new hot-jupiter transits investigated with Swift UVOT*” (accepted to AJ, arXiv:2110.01579)
- (4) K. S. Sotzen, K.B. Stevenson, **E. M. May**, et al. “*On the Utility of Transmission Color Ratios for Differentiating Super-Earths and Sub-Neptunes*” (accepted to ApJ, arXiv:2109.02714)
- (3) L. Mayorga, J. Lustig-Yaeger, **E. M. May**, et al. “*Transmission Spectroscopy of the Earth-Sun System to Inform the Search for Extrasolar Life*” *PSJ*, 2, 140 (2021)
- (2) L. C. Mayorga, T. D. Robinson, M. S. Marley, **E. M. May**, K. B. Stevenson, “*Variable Irradiation on 1D Cloudless Eccentric Exoplanet Atmospheres*” *ApJ*, 915, 41 (2021)
- (1) Jacob Bean et al. (101 co-authors including **E. M. May**) “*The Transiting Exoplanet Community Early Release Science Program for JWST*” *PASP*, 30, 114402 (2018)

Submitted and First Author In-Prep. (* = student advised, ** = co-first authors, status of draft is noted)

- (2) A. Savel et al. (including **E. M. May**) "*No Umbrella Needed: Confronting the hypothesis of iron rain on WASP-76b with post-processed general circulation models*" (Submitted)
- (1) **E. M. May**, K. B. Stevenson, et al. "*Uniform 4.5 Micron Spitzer Phase Curve Results for QATAR-1b, QATAR-2b, WASP-52b, WASP-34b, and WASP-140b*" (in prep., to be submitted October 2021)

Funded Awards, Grants, and Space Telescope Time

James Webb Space Telescope, Cycle 1

"*Under the Light of a Dead Star: Revealing the Atmospheric Composition of a White Dwarf Planet*"

PI: R. MacDonald; CoIs: (including **E. M. May**) - 13.3 hours

James Webb Space Telescope, Cycle 1

"*Tell Me How I'm Supposed To Breathe With No Air:*

Measuring the Prevalence and Diversity of M-Dwarf Planet Atmospheres"

PI: K. Stevenson; CoIs: (including **E. M. May**) - 75.6 hours

NASA ROSES XRP, 2021-2024

"*Consistency is Key: A Uniform Reanalysis of Spitzer Phase Curves*"

PI: E. May – \$683k total funding, \$267k to May

Ground-Based Observing Time

(6) Magellan Baade Telescope, IMACS, E. M. May (PI) , 4 nights	2019A Semester
(5) Magellan Baade Telescope, IMACS, E. M. May (PI) , 5 nights	2018B Semester
(4) Magellan Baade Telescope, IMACS, E. M. May (PI) , 4 nights	2018A Semester
(3) Magellan Baade Telescope, IMACS, E. M. May (PI) , 3 nights	2017B Semester
(2) Magellan Baade Telescope, IMACS, E. M. May (PI) , 3 nights	2017A Semester
(1) Magellan Baade Telescope, IMACS, E. M. May (PI) , 2 nights	2016B Semester

Teaching and Mentoring

Undergraduate and Graduate Students Advised

Current:	Tyler Gardner: <i>currently preparing a first-author publication on MOPSS data</i>	(Grad)
	Kelly Meyer: <i>currently preparing a first-author publication on MOPSS data</i>	(UG)
Previous:	James Lisowski: <i>worked on MOPSS data reduction</i>	(UG)
	Evan Scott: <i>machine learning to reach photon limited precision with ground-based spectroscopy</i>	(UG)
	Mariam Haidar: <i>red noise removal improvements to MOPSS pipeline, co-author on MOPSS I</i>	(UG)

Graduate Student Instructor Mentor, University of Michigan, Dept. of Astronomy

Fall 2017 – Spring 2019

Graduate Student Instructor, University of Michigan, Dept. of Astronomy

Spring 2015 – Fall 2015

Teaching Assistant, Michigan State University, Dept. of Physics and Dept. of Mathematics

Fall 2011 – Spring 2014

Guest Lecturer, Life in the Universe, University of Washington

Spring 2021

Conference, Seminar, and Invited Talks

- **STScI "Exoplanet Coffee" journal club** April 2021
- **CfA Exoplanet Lunch Seminar** Mar. 2021
- **The Interstellar Probe Study Webinar Series** Jan. 2021
"Exoplanets and Us: How looking back enables us look forward"
- **The 236th meeting of the American Astronomical Society, virtual** Jan. 2021
"Water Ice Cloud Variability & Multi-Epoch Transmission Spectra of TRAPPIST-1e"
- **UMD PALS Seminar** Dec. 2020
- **JILA Astrophysics Seminar** Nov. 2020
- **The Chesapeake Bay Area Exoplanet Meeting** June 2020
"A New and Uniform Spitzer Systematic Model."
- **The 235th meeting of the American Astronomical Society, Honolulu, HI** Jan. 2020
"The Degeneracy of BLISS mapping and PRF decorrelation in High Precision Spitzer Photometry."
- **Dissertation talk, 233rd meeting of the American Astronomical Society, Seattle, WA** Jan. 2019
"The Smallest Gas Exoplanets – Theoretical and Observational Studies of their Atmospheres"

- **Seminar, Las Campanas Observatory, La Serena, Chile** Sept. 2018
“Exoplanet Atmospheres at Magellan”
- **Origins Seminar, University of Arizona** Dec. 2017
- **Advanced School on Exoplanetary Science, Vietri Sul Mare, Italy** May 2017
“Exoplanet Atmospheres with the Magellan Baade Telescope”,
- **Magellan Science Meeting, Washington D.C.** Dec. 2016
“Exoplanet Atmospheres with IMACS”

Other/Service/ Outreach

- Invited Outreach/Lecture Speaker for the “Stanford Program for Inspiring the nExt Generation of Women in Physics)** July 2021
- Invited Speaker for Astronomy on Tap Lansing** May 2021
- American Astronomical Society Congressional Visit Day** Mar. 2019
- University of Michigan FEMMES Capstone Event** Nov. 2018
 Local Elementary Students (*Females Excelling More in Mathematics, Engineering, and the Sciences*)
- University of Michigan Museum of Natural History Science Communication Fellow** 2017-2019
- University of Michigan Time Allocation Committee – Magellan/MDM** 2017A
- Astronomy on Tap – Ann Arbor Location, Event Organizer** 2015-2017
- Conference Local Organizing Committees**
 - Multi-Dimensional Characterization of Distant Worlds, Ann Arbor, MI Oct. 2018
 - Origins of Volatiles in Habitable Planets, Ann Arbor, MI Oct. 2017

Ongoing Reviewer for NASA ROSES program elements, AAS journals, A&A