

Erin M. May

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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

- (8) 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*” (accepted to *ApJ*)
- (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)

- (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

Infrared Science Interest Group (IR SIG) Webinar

Dec. 2021

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 “ <i>Exoplanet Atmospheres at Magellan</i> ”	Sept. 2018
Origins Seminar, University of Arizona	Dec. 2017
Advanced School on Exoplanetary Science, Vietri Sul Mare, Italy “ <i>Exoplanet Atmospheres with the Magellan Baade Telescope</i> ”,	May 2017
Magellan Science Meeting, Washington D.C. “ <i>Exoplanet Atmospheres with IMACS</i> ”	Dec. 2016

Other/Service/ Outreach

Invited Speaker for Astronomy on Tap, Baton Rouge, LA	Dec. 2021
Invited Speaker for Astronomy on Tap, Saint Louis, MO	Dec. 2021
JWST subject matter expert, outreach event speaker, Maryland STEM festival	Dec. 2021
JWST subject matter expert, outreach event speaker, Gasden, AL Public Library	Nov. 2021
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, MI	May 2021
American Astronomical Society Congressional Visit Day	Mar. 2019
University of Michigan FEMMES Capstone Event Local Elementary Students (<i>Females Excelling More in Mathematics, Engineering, and the Sciences</i>)	Nov. 2018
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