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 — October 2019 – Present
Postdoctoral Fellow

Space Telescope Science Institute — July 2019 – October 2019
Postdoctoral Researcher with the STARGATE group

Education

PhD in Astronomy and Astrophysics — 2019
University of Michigan, Department of Astronomy
Advisor: Emily Rauscher
Thesis: The Atmospheres of the Smallest Gas Exoplanets

B.S in Astrophysics and Advanced Mathematics — 2014
Michigan State University, Department of Physics & Astronomy, Department of Mathematics

Publications in Astronomy

Refereed First Author (* = student advised)

(8) **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)
(7) **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*
(6) **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)
(5) **E. M. May** & E. Rauscher, *"The Effects of a Surface on Atmospheric Circulation and Emission for 1.5$R_\oplus$ Planets",* ApJ 893 161 (2020b)
(4) **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)
(3) **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)
(2) 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)
(1) **E. M. May** & E. Rauscher, *"Examining Tatooine: Atmospheric Models of Circumbinary Planets"* ApJ 826, 225 (2016)

Refereed Nth Author

(3) 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)
(2) 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)
*(1) 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)*

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

(4) 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*" (Submitted)
(3) 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)
(2) G. Fu et al. (including **E. M. May**) "*The Panchromatic Comparative Exoplanet Treasury Program: WASP-74b*" (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

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: *currently preparing a first-author publication on MOPSS data*	(Grad)
	Kelly Meyer: *currently preparing a first-author publication on MOPSS data*	(UG)
Previous:	James Lisowksi: *worked on MOPSS data reduction*	(UG)
	Evan Scott: *machine learning to reach photon limited precision with ground-based spectroscopy*	(UG)
	Mariam Haidar: *red noise removal improvements to MOPSS pipeline, co-author on MOPSS 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