Erin M. May

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

Relevant Employment

Johns Hopkins Applied Physics Laboratory — July 2022 – Present
Senior Professional Staff

Johns Hopkins Applied Physics Laboratory — October 2019 – July 2022
Postdoctoral Fellow

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

Education

Ph.D. 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 (ADS Library Link)

(8) **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*" AJ 163, 256 (2022)

(7) **E. M. May** & T. Komacek, et al. "*Spitzer phase curve observations and circulation models of the inflated ultra-hot Jupiter WASP-76b*" AJ, 162, 158 (2021b)

(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 (2021a)

(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 1.5$R_\oplus$ Planets",* ApJ 893 161 (2020b)

(3) **E. M. May** et al. *"MOPSS II: Extreme Optical Scattering Slope for the Inflated Super-Neptune HATS-8b",* AJ 159 7 (2020a)

(2) **E. M. May** et al. "*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 (ADS Library Link)

(11) L. Alderson et al. (including **E. M. May**) *"A comprehensive analysis of WASP-17b's transmission spectrum from space-based observations"* MNRAS, 512, 4185 (2022)

(10) J. Lustig-Yaeger, et al. (including **E. M. May**) *"Hierarchical Bayesian Atmospheric Retrieval Modeling for Population Studies of Exoplanet Atmospheres: A Case Study on the Habitable Zone"* AJ, 163, 140 (2022)

(9) 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*" AJ, 926, 85, 2022

(8) L. Corrales, et al. (including **E. M. May**) "*Five new hot-jupiter transits investigated with Swift UVOT*" AJ 162, 287 (2021)

(7) G. Fu, D. Deming, **E. M. May**, et al. "*The Hubble PanCET program: Transit and Eclipse Spectroscopy of the Hot Jupiter WASP-74b*" AJ, 162, 271 (2021)

(6) J. Lustig-Yaeger, et al. (including **E. M. May**) "*Retrieving Exoplanet Atmospheres using Planetary Inffrared Excess: Prospects for the Nightside of WASP-43b and other Hot Jupiters"* ApJL, 921, L4 (2021)

(5) 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*" AJ, 162, 168 (2021)

(4) L. C. 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)
(3) 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)
(2) D. Keating et al. (including **E. M. May**) "*Smaller than Expected Bright-spot Offsets in Spitzer Phase Curves of the Hot Jupiter Qatar-1b"* AJ, 159, 225 (2020)
(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)

Funded Awards, Grants, and Space Telescope Time

Hubble Space Telescope, Cycle 30
"The HST/JWST synergy: A deep dive into the NUV with WASP-39b to answer key formation questions"
PI: David Sing; Funded CoI include **E. M. May** – 24 orbits

JWST, Cycle 1
" Under the Light of a Dead Star: Revealing the Atmospheric Composition of a White Dwarf Planet"
PI: R. MacDonald; Funded CoIs include **E. M. May**)- 13.3 hours

JWST, 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; Funded CoIs include **E. M. May** - 75.6 hours

JWST, Cycle 1
"Unshrouding the Sub-Neptune Population: The Case of TO-421b"
PI: Eliza Kempton; CoIs include **E. M. May** – 11.0 hours

JWST, Cycle 1 Early Release Science
"The Transiting Exoplanet Community Early Release Science Program"
PI: Natalie Batalha; CoIs include **E. M. May** – 86.6 hours

NASA ROSES XRP, 2022-2025
"*Consistency is Key: A Uniform Reanalysis of Spitzer Phase Curves"*
PI: **E. M. May** – $683k total funding, $267k to May

NASA ICAR, 2021-2024
"The M-dwarf Opportunity"
Consortium on Habitability and Atmospheres of M-dwarf Planets (CHAMPs)
PI: K. Stevenson/R. Kopparapu; Funded CoIs include **E. M. 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

Previous:	Tyler Gardner: *worked on MOPSS data reduction and code development*	(Grad)
	Kelly Meyer: *worked on MOPSS data*	(UG)
	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

Contributed, Invited, and Seminar/Colloquia Talks

NASA Goddard Exoplanet Seminar June 2022
Royal Astronomical Society Specialist Discussion Keynote Speaker Apr. 2022
"A Changing Climate: Why 3D Models are Crucial for the Interpretation of Multi-Epoch Observations of Small Planets with JWST"
Carnegie EPL Astronomy Seminar Mar. 2022
McGill Astronomy Seminar Feb. 2022
UCSC PLUNCH Seminar Jan. 2022
Infrared Science Interest Group (IR SIG) Webinar Dec. 2021
STScI "Exoplanet Coffee" journal club Apr. 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
UMD PALS Seminar Dec. 2020
JILA Astrophysics Seminar Nov. 2020
The Chesapeake Bay Area Exoplanet Meeting June 2020
The 235th meeting of the American Astronomical Society, Honolulu, HI Jan. 2020
Dissertation talk, 233rd meeting of the American Astronomical Society, Seattle, WA Jan. 2019
Seminar, Las Campanas Observatory, La Serena, Chile Sept. 2018
Origins Seminar, University of Arizona Dec. 2017
Advanced School on Exoplanetary Science, Vietri Sul Mare, Italy May 2017
Magellan Science Meeting, Washington D.C. Dec. 2016

Outreach

Astronomy on Tap
Speaker – Lansing, MI / Saint Louis, MO / Baton Rouge, LA ongoing
Organizer – Ann Arbor Location 2015-2017
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
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

Other/Service

ExoPAG Executive Committee Member ongoing
Transiting Exoplanet JWST ERS team member and transmission working group member ongoing
JWST Telescope Scientist Team (TST) Transiting Exoplanet GTO project level member ongoing
Conference Local Organizing Committees
CHAMPs Seminar Series, virtual ongoing
(led the organization of the CHAMPs ECR Seminar Series in response to AAS 239 cancellation)
Multi-Dimensional Characterization of Distant Worlds, Ann Arbor, MI Oct. 2018
Origins of Volatiles in Habitable Planets, Ann Arbor, MI Oct. 2017
NASA PI Launchpad (attendee) Jul. 2021
University of Michigan Time Allocation Committee – Magellan/MDM 2017A

Ongoing Reviewer for NASA ROSES program elements, AAS journals, A&A journal, NASA Hubble, and other NASA supported observatories.