Erin M. May

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

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

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)

(17) Feinstein, A. et al. (including **E. M. May**) *"Early Release Science of the Exoplanet WASP-39b with JWST NIRISS"* submitted to Nature, arXiv:2211.10493
(16) Ahrer, E. et al. (including **E. M. May**) *"Early Release Science of the Exoplanet WASP-39b with JWST NIRCam"* submitted to Nature, arXiv:2211.10489
(15) Alderson, L. et al. (including **E. M. May**) *"Early Release Science of the Exoplanet WASP-39b with JWST NIRSpec G395H"* submitted to Nature, arXiv:2211.10488
(14) Rustamkulov, Z., Sing, D. K., Mukherjee, S., **May, E. M.** et al. *"Early Release Science of the Exoplanet WASP-39b with JWST NIRSpec PRISM"* submitted to Nature, arXiv:2211.10487
(13) The JWST Transiting Exoplanet Community Early Release Science Team (including **E. M. May**) *"Identification of carbon dioxide in an exoplanet atmosphere"* accepted to Nature, arXiv:2208.11692
(12) T. Bell et al. (including **E. M. May**) *"Eureka!: An End-to-End Pipeline for JWST Time-Series Observations"* JOSS, 7, 4503 (2022)
(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 Infrared 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 General Observer (GO)
" 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

"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

"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 (ERS)
"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 JPL Exoplanet Lecture Series — Oct. 2022
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
Cross-AG Inclusion, Diversity, Equity, & Accessibility (IDEA) Working Group Member — ongoing
DART Investigation Team 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
DMV area planet-related science networking workshop — Sept. 2022
CHAMPs Early Career Seminar, virtual — Jan. 2022
(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

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