

Thomas Mikal-Evans

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PRIMARY RESEARCH ACTIVITIES

Observational characterization of exoplanet atmospheres. Transmission and emission spectroscopy using both space-based and ground-based telescopes. PI of 6 HST programs awarded 168 orbits and JWST Cycle 1 program awarded 44.7 hours for exoplanet spectroscopy.

EMPLOYMENT

Postdoctoral Scholar, Aug 2018-present, MIT, USA

Postdoctoral Scholar, Aug 2014-Jul 2018, University of Exeter, UK

EDUCATION

DPhil, Physics (Astrophysics), 2010-2014, University of Oxford, UK

- Clarendon Scholarship, 2010-2013

MPhil (Science), Physics (Astrophysics), 2009-2010, University of Sydney, Australia

BPhil (Science) (Hons I), 2005-2008, Australian National University, Australia

- BPhil Scholarship, 2005-2008
- Bok Scholarship, 2008

TELESCOPE PROGRAMS

As principal investigator:

1. James Webb Space Telescope, 2021, *A NIRSpec Phase Curve for the Ultrahot Jupiter WASP-121b*, **44.7 hours**
2. Hubble Space Telescope 2019, *Atmospheric characterization of two temperate mini-Neptunes formed in the same protoplanetary nebula*, **26 spacecraft orbits**
3. Hubble Space Telescope 2019, *Seeing in 3D: unlocking the dynamical properties of a canonical exoplanet*, **60 spacecraft orbits**
4. Spitzer Space Telescope 2017, *A global map of the atmospheric circulation and thermal structure for an ultrahot exoplanet*, **80 hours**
5. Hubble Space Telescope 2017, *A global map of thermal inversions for an ultra-hot planet*, **52 spacecraft orbits**
6. Hubble Space Telescope 2017, *An exoplanet with a stratosphere: seeking the unknown absorber*, **10 spacecraft orbits**
7. Hubble Space Telescope 2016, *Characterizing an extreme planet on the verge of tidal disruption*, **5 spacecraft orbits**

8. Hubble Space Telescope 2015, *Measuring the L-T transition for a warm Saturn exoplanet*, **15 spacecraft orbits**
9. ESO Very Large Telescope 2015/2016, *Extending the WASP-43b emission spectrum to visible wavelengths*, **3 nights**
10. ESO Very Large Telescope 2013/2014, Probing exoplanet atmospheres using KMOS differential spectroscopy, **2 nights**
11. Nordic Optical Telescope, 2013, Measuring the atmosphere of the transiting exoplanet HAT-P-32b using multi-object spectroscopy with ALFOSC, **2 nights**
12. William Herschel Telescope, 2013, Using LIRIS to measure the transmission spectrum of HAT-P-12b, **2 nights**
13. Liverpool Telescope, 2012, Activity monitoring of exoplanet host stars in support of a large HST program, **11.5 hours**

As co-investigator:

- James Webb Space Telescope Transiting Exoplanet ERS program (80.5 hours)
- 10x Hubble Space Telescope programs totalling 740 spacecraft orbits
- 3x Spitzer Space Telescope programs totalling 91 hours
- 4x ESO VLT programs totalling 232 hours
- 2x Gemini programs totalling 20 hours

SUMMARY OF PUBLICATIONS

11 published first-author papers with 623 citations combined

83 published papers total (see www.thomasmevans.com for full listing)

5 in Nature (including 1 as first-author) and 1 in Science

NASA ADS: 3,352 citations combined, h-index of 33

Google Scholar: 4,149 citations combined, h-index of 34

FIELD CONTRIBUTION HIGHLIGHTS

- First optical albedo spectrum for an exoplanet (Evans et al., 2013)
- First application of Gaussian processes to Spitzer light curves (Evans et al., 2015)
- First definitive detection of an exoplanet thermal inversion (Evans et al., 2017; Mikal-Evans et al., 2020)
- First detection of new UV absorber in ultrahot Jupiter atmosphere (Evans et al., 2018)
- First direct detection of H⁻ ions in an exoplanet atmosphere (Mikal-Evans et al., 2019)
- One of the first sub-Neptune spectra published (Mikal-Evans et al., 2021)

SUPERVISION AND TEACHING

Co-supervising graduate student, 2021 ongoing, MIT

- Preparing publication with student reporting results from one of my HST programs

Guest lecturer, 12.425 “Extrasolar Planets” (Prof. Seager), Fall Term 2020, MIT

Supervised full-time undergraduate research project, Summer 2020, MIT

Supervised 3x undergraduate research projects, Spring Term 2019, MIT
Astrophysics computer lab demonstrator, 2012-2014, University of Oxford
Physics undergraduate problem sets tutor, 2009-2010, University of Sydney

ACADEMIC SERVICE

Referee for academic journals:

- Science, Astronomical Journal, Astrophysical Journal, Monthly Notices of the Royal Astronomical Society, Astronomy & Astrophysics

Reviewer for grant applications:

- Hubble Space Telescope Cycle 28 External Reviewer, 2020
- Canadian Time Allocation Committee (CanTAC) External Reviewer, 2020
- Hubble Space Telescope Cycle 27 Review Panel member, 2019
- NASA Exoplanet Research Program External Reviewer, 2018
- Isaac Newton Group of Telescopes External Reviewer, 2016

MIT Exoplanet Journal Club organizer, 2018-2020

JWST Early Release Science Exoplanet Transmission Spectroscopy Working Group

TESS Atmospheric Characterization Working Group

- Target Selection lead

Origins Space Telescope Exoplanets Working Group

Conference Local Organizing Committees:

- UK Exoplanet Meeting, 2016, Exeter, UK
- Exoplanets and Their Host Stars, STFC Workshop, 2012, Oxford, UK
- New Horizons in Time Domain Astronomy, IAU Symposium, 2011, Oxford, UK

SELECTED SEMINARS AND CONFERENCE TALKS (2018-2021)

1. Seminar, Harvard-Smithsonian Center for Astrophysics, 2021, USA (virtual)
2. Max Planck Group Leader Symposium, 2021, Germany (virtual)
3. Exoplanets 3 Conference, 2020, Heidelberg, Germany (virtual)
4. Exocoffee, 2020, Max Planck Institute for Astronomy, Germany (virtual)
5. 235th AAS Meeting, 2020, Honolulu, HI
6. Astrophysics Journal Club, 2019, MIT, USA
7. Exoclimates V Conference, 2019, Oxford, UK
8. Astrophysics Seminar, 2019, University of New South Wales, Australia
9. 234th AAS Meeting, 2019, Seattle, WA
10. Boston Area Exoplanet Science Meeting, 2018, MIT, USA
11. Bay Area Exoplanet Science Meeting, 2018, NASA Ames, USA
12. Astrophysics seminar, 2018, Queens University Belfast, UK
13. Exoplanet group seminar, 2018, Queen Mary University, UK
14. Exoplanet journal club, 2018, JPL, USA