Michael M. Fausnaugh

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Appointments

Massachusetts Institute of Technology, Cambridge, MA

2017–present — Research Scientist

Responsibilities:

- Data Quality Assurance for NASA's TESS mission
- Mission and Observation Planning for TESS
- Software Development for TESS
- Original Research Programs

The Ohio State University, Columbus, OH

2016–2017 — OSU Presidential Fellow

2013–2016 — Graduate Research Assistant

2012–2013 — Graduate Teaching Assistant

Adler Planetarium, Chicago, OH

2011–2012 — Research Assistant, VERITAS Telescope Array
ARIEL Internship, awarded and funded by St. John's College

Education

2017 — Ph.D., Astronomy, The Ohio State University; Advisor: Prof. Bradley Peterson

2014 — M.S., Astronomy, The Ohio State University

2011 — B.A., History of Math and Science, Philosophy, St. John's College, Santa Fe, NM

Professional Experience

Five **first author** papers accepted (97 citations).

27 **papers** total, 10 minor publications.

Referee for *Nature*, *Nature Astronomy*, leading astrophysics journals (*ApJ*, *MNRAS*, *Astronomy & Astrophysics*, *PASP*), and *Frontiers*.

Chair and Organizer for speciall session "TESS and Transient Science" at AAS 235, January 2020.

Co-Chair of LOC for the New England Regional Quasar and AGN Meeting, May 2019.

Mentor for 2 MIT Graduate Students and 2 MIT Undergraduates.

Honors/ Awards

OSU Markowitz Award for Excellence in Observational Astronomy, 2016-17

OSU Hayes Research Forum, 2nd place Oral Presentation, March 2017

OSU Graduate School Presidential Fellow, 2016–2017

St. John's College Award for Sustained Academic Excellence, May 2011

St. John's College ARIEL Internship, May 2011

Research/ Skills	**Interests**	**Experience**	**Programming**
	Super-massive black holes	Data reduction, analysis, & visualization	Adept in python
	Extra-galactic astronomy		Proficient in matlab, bash, latex, git
	Observational astronomy	Image processing	
	Data analysis methods	Time series analysis	Working knowledge of c++, fortran, perl
		Software design, implementation, and management	

Presentations

Invited Talks

1. Northrop Grumman Innovation Systems, Sterling, VA. April 2019
2. CCAP Summer Seminar, The Ohio State University. Columbus, OH. June 2016
3. Harvard-Smithsonian Center for Astrophysics. Cambridge, MA. Nov 2016

TESS

4. TESS Science Conference. MIT. Cambride, MA. Aug 2019
5. Meeting of the American Astronomical Society #233. Seattle, WA. Jan 2019
6. TESS Science Meeting. MIT. Cambridge, MA. Oct. 2018

AGN

7. NERQUAM 2019. MIT. Cambridge, MA. May 2019
8. AGN STORM Research Meeting. Atlanta, GA. Aug 2017
9. Hayes Research Forum. The Ohio State University. Columbus, OH. March 2017
10. AGN Research Group Meeting. Space Telescope and Science Institute. Baltimore, MD. Feb 2017
11. MIT Kavli Institute Research Lunch. Cambridge, MA. Jan 2017
12. Meeting of the American Astronomical Society #229. Grapevine, TX. Jan 2017
13. AGN STORM Workshop. Reykjavik, Iceland. July 2016
14. Great Lakes Quasar Symposium, Western University. London, Ontario. May 2016
15. R. Narayan's Research Group Meeting, Harvard-Smithsonian Center for Astrophysics. Cambridge, MA. April 2016
16. Quasar Research Group Meeting, Harvard-Smithsonian Center for Astrophysics. Cambridge, MA. April 2016
17. AGN Research Group Meeting. Space Telescope and Science Institute. Baltimore, MD. March 2016
18. AGN STORM Workshop. Columbus, OH. July 2015
19. Meeting of the American Astronomical Society #225. Seattle, WA. Jan 2015
20. AGN Research Retreat. University of St. Andrews. St. Andrews, Scotland. Jan 2015
21. Catolica Workshop. The Ohio State University. Columbus, OH. May 2014
22. Spitz Summer Institute, planetarium workshop/training. Spitz Inc. Chadds Ford, PA. July 2013

Mentoring/ Teaching

Mentor for MIT Graduate Students:

Akshata Krishnamurthy	Noise Floor in of the TESS Detectors	2019
Rahul Jayaraman	Searching for Transients in TESS FFIs	2019

Suporvisor through MIT Undergraduate Research Opportunity Program:

Nadia Dimitrova	2017
Ally Hong	2018–present
Jason Yang	2019–present

Graduate Teaching Associate, The Ohio State University:
Graded exams, designed/hosted review sessions.

- Autumn 2012: Astro 2291, Intro to Astronomy and Planets (calculus-based).
- Spring 2013: Astro 1161, Intro to Astronomy and the Solar System.

Head Laboratory Assistant, St. John's College:
Demonstrated/guided classroom practica, developed/documented experiments.

- 2010–2011: St. John's College Senior-year Laboratory

Laboratory Assistant, St. John's College:
Demonstrated/guided classroom practica.

- 2009–2010: St. John's College Junior-year Laboratory

Observing Experience

Total:	119 nights	(81 queue, 38 classical)
Large Binocular Telescope:	54 nights	2013-2016
MDM 2.4m Hiltner:	24 nights	2012-2015
MDM 1.3m McGraw:	18 nights	2013-2014
CTIO SMARTS 1.3m:	16 nights	2015
VERITAS (γ-ray observatory):	7 nights	2011

Selected Outreach

OSU Planetarium: Developed/wrote all or part the following shows:

- 2013: *OSU Planetarium Grand Reopening, The Sky Tonight.*
- 2014: *Journey through the Solar System.*
- 2015: *The Autumn Sky: Hidden Treasures.*

Presented 2-4 planetarium shows per month (Over 100 shows from 2013-2016).
Wickliffe Elementary Space Day (2013 January 18).
Bailey Elementary Astronomy mini-course (2013 March 15).
4-H Science Saturday (2013 April 6).
Blendon Middle School Career Day (2013 May 14).
Hosted a high school student for 1 day (2014 May 28).
Upper Arlington Library Summer Astronomy Series (June 2014, 2015, 2016).

Publications

First Author

1. "Continuum Reverberation Mapping of the Accretion Disk in Two Seyfert 1 Galaxies"
M. M. Fausnaugh et al. (71 authors), *Astrophysical Journal*, 854:107 (2018).

2. "Reverberation Mapping of Optical Emission Lines in Five Active Galaxies"
M. M. Fausnaugh et al. (71 authors), *Astrophysical Journal*, 840:97 (2017).

3. “A New Approach to the Internal Calibration of Reverberation Mapping Spectra”
M. M. Fausnaugh (single author), *Publications of the Astronomical Society of the Pacific*, 129:972 (2017). Includes first video abstract ever published by PASP.

4. “Space Telescope and Optical Reverberation Mapping Project. III. Optical Continuum Emission and Broad-Band Time Delays in NGC 5548”
M. M. Fausnaugh et al. (99 authors), *Astrophysical Journal*, 821:56 (2016).

5. “The Cepheid distance to the maser-host galaxy NGC 4258: studying systematics with the Large Binocular Telescope”
M. M. Fausnaugh, C. S. Kochanek, J. R. Gerke, L. M. Macri, A. G. Riess, K. Z. Stanek, *Monthly Notices of the Royal Astronomical Society*, 450:3597 (2015).

Major Contributing Author

6. “Space Telescope and Optical Reverberation Mapping Project. V. Optical Spectroscopic Campaign and Emission-Line Analysis for NGC 5548”, L. Pei, **M. M. Fausnaugh**, and 152 others, *Astrophysical Journal*, 837:131 (2017).

7. “Swift Monitoring of NGC 4151: Evidence for a Second X-ray/UV Reprocessing”, R. Edelson, J. Gelbord, E. Cackett, C. Done, **M. M. Fausnaugh**, and 37 others *Astrophysical Journal*, 840:41 (2017).

8. “Spitzer Space Telescope Measurements of Dust Reverberation Lags in the Seyfert 1 Galaxy NGC 6418”, B. Vazquez, P. Galianni, M. Richmond, A. Robinson, D. J. Axon, K. Horne, T. Almeyda, **M. M. Fausnaugh**, and 18 others, *Astrophysical Journal*, 801:127 (2015).

Contributing Author

9. “Space Telescope and Optical Reverberation Mapping Project. VII. Understanding the Ultraviolet Anomaly in NGC 5548 with X-Ray Spectroscopy”, Mathur, S. et al. (150 authors, including **M. M. Fausnaugh**) *Astrophysical Journal*, 846:55 (2017).

10. “Space Telescope and Optical Reverberation Mapping Project. VI. Reverberating Disk Models for NGC 5548”, D. Starkey, K. Horne, **M. M. Fausnaugh**, and 96 others, *Astrophysical Journal*, 835:65 (2017).

11. “Space Telescope and Optical Reverberation Mapping Project. IV. Anomalous behavior of the broad ultraviolet emission lines in NGC 5548”, M. R. Goad et al. (102 authors, including **M. M. Fausnaugh**), *Astrophysical Journal*, 824:11 (2016).

12. “Space Telescope and Optical Reverberation Mapping Project. II. Swift and HST Reverberation Mapping of the Accretion Disk of NGC 5548”, R. Edelson et al. (50 authors, including **M. M. Fausnaugh**), *Astrophysical Journal*, 806:129 (2015).

13. “Space Telescope and Optical Reverberation Mapping Project. I. Ultraviolet Observations of the Seyfert 1 Galaxy NGC 5548 with the Cosmic Origins Spectrograph on Hubble Space Telescope”, G. De Rosa et al. (50 authors, including **M. M. Fausnaugh**), *Astrophysical Journal*, 806:128 (2015).

14. “Swift/UVOT Grism Monitoring of NGC 5548 in 2013: An Attempt at MgII Reverberation Mapping”, E. M. Cackett, K. Gültekin, M. C. Bentz, **M. M. Fausnaugh**, B. M. Peterson, J. Troyer, M. Vestergaard, *Astrophysical Journal*, 810:86 (2015).

15. “XMM-Newton Observations of the Peculiar Cataclysmic Variable Lanning 386: X-ray evidence for a Magnetic Primary”, M. R. Kennedy, P. Callanan, P. M. Garnavich, **M. M. Fausnaugh**, J. C. Zinn, *Monthly Notices of the Royal Astronomical Society*, 466:2202 (2017).

16. “Ground-based Parallax Confirmed by Spitzer: Binary Microlensing Event MOA-2015-BLG-020”, T. Wang, et al. (87 authors, including **M. M. Fausnaugh**, *Astrophysical Journal*, 845:129(2017).

17. “OGLE-2015-BLG-1482L: The First Isolated Low-mass Microlens in the Galactic Bulge”, S. J. Chung (42 authors, including **M. M. Fausnaugh**), *Astrophysical Journal*, 838:154 (2017).

18. “Toward a Galactic Distribution of Planets. I. Methodology & Planet Sensitivities of the 2015 High-Cadence Spitzer Microlens Sample”, W. Zhu et al. (28 authors, including **M. M. Fausnaugh**), submitted to *Astrophysical Journal* 2017 January 18.

19. “OGLE-2015-BLG-0196: Ground-based Gravitational Microlens Parallax Confirmed by Space-based Observation”, C. Han et al. (26 authors, including **M. M. Fausnaugh**), *Astrophysical Journal*, 834:82 (2017).

20. “First simultaneous microlensing observations by two space telescopes: Spitzer & Swift reveal a brown dwarf in event OGLE-2016-BLG-1319”, Y. Shvartzvald et al. (94 authors, including **M. M. Fausnaugh**), *Astrophysical Journal*, 831:183 (2016).

21. “OGLE-2015-BLG-0479LA,B: Binary Gravitational Microlens Characterized by Simultaneous Ground-based and Space-based Observations”, C. Han et al. (63 authors, including **M. M. Fausnaugh**), *Astrophysical Journal*, 828:53 (2016).

22. “The Spitzer Microlensing Program as a Probe for Globular Cluster Planets: Analysis of OGLE-2015-BLG-0448”, P. Radoslaw et al. (92 authors, including **M. M. Fausnaugh**), *Astrophysical Journal*, 823:63 (2016).

23. “Spitzer Observations of OGLE-2015-BLG-1212 Reveal a New Path to Breaking Strong Microlens Degeneracies”, V. Bozza et al. (92 authors, including **M. M. Fausnaugh**), *Astrophysical Journal*, 820:79 (2016).

24. “Spitzer Microlens Measurement of a Massive Remnant in a Well-Separated Binary”, Y. Shvartzvald et al. (66 authors, including **M. M. Fausnaugh**), *Astrophysical Journal*, 814:111 (2015).

25. “Spitzer IRAC Photometry for Time Series in Crowded Fields”, S. Calchi Novati et al. (25 authors, including **M. M. Fausnaugh**), *Astrophysical Journal*, 814:92 (2015).

26. “The Typecasting of Active Galactic Nuclei: Mrk 590 no Longer Fits the Role”, K. D. Denney et al. (12 authors, including **M. M. Fausnaugh**), *Astrophysical Journal*, 796:134 (2014).

27. “SN 2012au: A Golden Link between Superluminous Supernovae and Their Lower-luminosity Counterparts”, D. Milisavlejic et al. (29 authors, including **M. M. Fausnaugh**), *Astrophysical Journal*, 770:L38 (2013).

Minor Publications

28–34. Seven *Astronomer’s Telegrams* with the ASAS-SN research group (#5102, #5110, #6143, #6158, #8352, #8356, #9146, unrefereed, 2013–2016).

35. “TESS Data Processing and Quick-look Pipeline”, **M. M. Fausnaugh**; Xu Huang; Ana Glidden; Natalia Guerrero; TESS Science Office, Meeting of the American Astronomical Society #231 (2018).

36. “Reverberation Mapping of AGN Accretion Disks”, **M. M. Fausnaugh**, Meeting of the American Astronomical Society #229 (2017).

37. “AGN Space Telescope and Optical Reverberation Mapping Project II. Ultraviolet and Optical Continuum Analysis”, **M. M. Fausnaugh**, Meeting of the American Astronomical Society #225 (2015).