Matthew C. De Furio

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Positions

NSF Astronomy and Astrophysics Postdoctoral Fellow - UT Austin Sept 2023 - Present

Education

University of Michigan (UM) – Ann Arbor September 2019 - August 2023
PhD: Astronomy & Astrophysics, **Advisor**: Prof. Michael Meyer
University of Michigan – Ann Arbor September 2017 - August 2019
MS: Astronomy & Astrophysics, **Advisor**: Prof. Michael Meyer
University of Florida (UF) September 2012 - December 2016
BS (Summa cum Laude): Major: Physics, Astronomy; Minor: Mathematics

Highlights

- **$1,079,495** in total funding **– $992,894** as Principal Investigator
- **Ten first author publications**, h-index: 16, i10-index: 22
- Twelve approved PI (or co-PI) proposals at 5 facilities **including JWST and HST**
- Fifteen invited academic talks
- Seven student research mentees: **one mentee as first-author** on an AJ publication, **one mentee as second-author** on ApJ publication, two with papers planned for 2026
- **Designed and taught four courses** for adults with intellectual disabilities (see below)

Grants and Observing Programs

NSF Astronomy and Astrophysics Postdoctoral Fellowship ($330,000)
Principal Investigator or co-Principal Investigator (total program funding):

- **James Webb Space Telescope:**
  - 10.7 hours in Cycle 3, GO 5409 **($255,875)**
  - Archival program Cycle 4, GO 8369 **($110,000)**
- **Hubble Space Telescope:**
  - 7 orbits in Cycle 30, GO 17141 **($132,869)**: Characterize stellar and sub-stellar multiplicity in NGC 1333 and search for wide planetary mass objects, includes supervisory effort with a postbac student and two undergraduate students
  - Archival program Cycle 31, AR 17561 **($94,000)**: Performing largest brown dwarf multiplicity survey to date, includes supervisory effort with a graduate student, postbac student, and undergraduate student

- **NASA/Keck**
  - One night in 2023B with NIRC2-LGS **($13,750)**
  - One night in 2025A with NIRC2-LGS **($17,100)**
- **NSF's NOIRLab:**
  - 33.5 hours at Gemini-N/S 'Alopeke/Zorro in 2023B and 2024B
  - Ten nights at CHARA in 2020B, 2023B, and 2025A with MIRC-X/MYSTIC
- **CHARA Consortium:** Four nights at CHARA in 2022A with MIRC-X/MYSTIC

Co-Investigator (my managed funding):

- **James Webb Space Telescope:** Cycle 1 (GO 2473, 2627), Cycle 2 (GO 3840, 3907, 4147), Cycle 4 (7230, 7988) total of 92.86 hours
- **Hubble Space Telescope:**
  - 3 orbits in Cycle 30 Mid-Cycle, GO 17283
  - 2 orbits in Cycle 31, GO 17466 **($38,145)**
  - 2 orbits in Cycle 32, GO 17841 **($48,456)**
  - 28 orbits in Cycle 33, GO 18110

Presentations

Invited Academic Talks:

2026	24th Annual NSF AST Fellow's Symposium
2025	Penn State Center for Exoplanets and Habitable Worlds Seminar Series
2025	University of Arizona Origins Seminar
2025	Rice University Physics and Astronomy Seminar
2025	University of Rochester Astronomy & Astrophysics Colloquium
2025	Brown Dwarfs Keep Their Cool: 30 Years of Substellar Science. La Gomera, ES
2025	NIRCam Science Team Meeting. Oracle, AZ
2025	23rd Annual NSF AST Fellow's Symposium
2024	University of Montreal Colloquium Series
2024	University of Texas at Austin Colloquium Series
2024	Optical Long Baseline Interferometry: Your Next Essential Research Tool
2024	22rd Annual NSF AST Fellow's Symposium
2023	Chalmers Astrophysics Colloquium, Origins Seminar at U. Virginia
2022	CalTech/IPAC Seminar Series
2019	The University of Florida Stellar Seminar

Contributed Academic Talks:

2025	247th AAS Meeting. Phoenix, AZ
2025	Multiplicity in Young Stars. Copenhagen, Denmark
2025	Other Worlds Laboratory Meeting. Santa Cruz, CA
2025	SPIE Optics + Photonics. San Diego, CA
2025	246th AAS Meeting. Anchorage, AK
2024	Rogue Worlds 2024. Osaka, Japan
2023	Two in a million - The interplay between binaries and star clusters, ESO Garching

2023 2023 CHARA Science Meeting
2023 241st Meeting of the American Astronomical Society
2022 The Sharpest Eyes on the Sky
2021 237th Meeting of the American Astronomical Society
2021 Cool Stars 20.5
2019 Understanding the Nearby Star-forming Universe with JWST

Select Public Talks
2025 UT-Austin and McDonald Observatory Board of Visitors Meeting
2025 Fort Worth Astronomical Society
2025 Astronomy on Tap ATX

Other Select Presentations:
2025 246th Meeting of the American Astronomical Society
2024 Cool Stars 22. San Diego, CA
2023 Protostars and Planets VII. Kyoto, Japan
2022 Cool Stars 21. Toulouse, France
2021 Star Formation: From Clouds to Disks: A Tribute to the Career of Lee Hartmann
2019 233rd Meeting of the American Astronomical Society
2016 227th Meeting of the American Astronomical Society

Advising:

- **co-Research Supervisor** of Andrea Vu (undergraduate), U of Waterloo 2025
  - Will receive high author billing on soon to be submitted paper that relied on her work searching for gas giant exoplanets around white dwarfs for JWST program GO 3964
- **co-Research Supervisor** of Christopher Blackburn (undergraduate), Rice 2025 - Present
  - Writing senior thesis on wide gas giant occurrence rates in a young star-forming region based on his work on HST program GO 17141
- **Research Supervisor** of Kunal Mehta (undergraduate, postbac), RPI 2024 - Present
  - First author on accepted AJ paper based on his work on HST program AR 17561
- **Research Supervisor** of Tanner Wiley (undergraduate), UT 2024 - Present
  - Plans to write AAS research note on identification of brown dwarf candidates in NGC 1333 as part of GO 17141
- **Research Supervisor** of Mitchell Shadden (undergraduate), UT 2024
- **Research Supervisor** of Christopher Liu (undergraduate), UM 2020 - 2022
  - Second author on published ApJ paper that relied on his work
- **Research Supervisor** of Autumn Cain (undergraduate) UM 2019
- **Peer Mentor**, Astronomy Mentorship Program for Upcoming Postdocs 2023 - Present

Teaching:

- **Instructor** for Lifelong Learning with Friends, a non-profit organization dedicated to providing comprehensive support to adults with intellectual and developmental disabilities. I taught an introductory astronomy course in Summer 2025, an observational

astronomy course in Fall 2025, and two classes in Spring 2026 on exoplanets and life beyond Earth as well as the science of science fiction.
- **Special Olympics Texas Summer Games:** I led and organized a group from UT to go to this event in 2025 to do daytime observing of the Sun and the Moon with about 800 people interacting with us throughout the event.
- **Guest Lecturer**, AST364P: Planetary Systems, UT 2024
- **Graduate Student Instructor**, Astronomy 101, Introductory Astronomy 2018
- **Peer Group Tutor**, Introduction to Physics, Introduction to Astronomy, UF 2015-2016

Service

- **Roman Space Telescope Galactic Plane Survey Definition Committee** 2024 - Present
- **NSF REU Program Student Supervisor**, UT Summer 2024
- **Science Organizing Committees:** Roman Galactic Plane Survey Community Workshop 2025, Bashfest at UT Austin 2025, Star and Planet Formation in the Southwest 2025
- **Local Organizing Committee,** JWST Proposal Workshop, UM 2020
- **Breakout Session Chairs:** Roman Galactic Plane Survey Community Workshop 2025, JWST Proposal Workshop at UM 2020
- **Time Allocation Committees:** NOIRLab, UM internal
- **Subject-matter Expert Reviewer in a NASA Peer Review** 2025
- **Keck LGS AO Working Group** 2025-Present
- **Lead Facilitator:** Stars and Exoplanets Journal Club at UT, Stars/Planets/Formation Group at UM
- **AAS Session Chair** 2020
- **Department Steward**, Graduate Employees' Organization, UM 2020 - 2022
- **Prospective Graduate Student Visit Organizer**, UM 2019 - 2020

Trainings

- **Disability Advocate Training**, UT
- **Neurodiversity Affirming Training**, UT

Other Awards

- **Rackham Predoctoral Fellowship**, UM **($37,000)** 2022 - 2023
- **Strategic University Research Partnership**, Jet Propulsion Laboratory 2021 - 2023
- **Rackham Travel Grant**, UM **($2,300)** 2018, 2023
- **Dorothy W. and Terry Smiljanich Outstanding Senior Thesis Award**, UF 2016
- **University Scholars Award**, UF 2015 - 2016
- **Center for Condensed Matter Sciences Undergraduate Fellowship**, UF 2015 - 2016
- **Florida Bright Futures Academic Scholar** 2012 - 2016

Professional Affiliations

- **JWST NIRCam Science Team**, Member and Science lead for GTO Program 1190
- **JWST NIRISS Science Team**, Member
- **JWST High Contrast Imaging Early Release Science Team**, Member
- **American Astronomical Society**, Full member

Press

- **AAS Nova,** A Strange Brown Dwarf Gets Stranger
- **NASA/STScI**, NASA's Webb Peers Deeper into Mysterious Flame Nebula
- **AAS Nova**, Astronomers Measure Turnover in Initial Mass Function for the First Time
- **Phys.org**, Webb peers deeper into mysterious Flame Nebula to find 'failed stars'
- **McDonald Observatory**, UT Astronomers Peers Deeper into Mysterious Flame Nebula
- **Michigan News**, U-M astronomers peer deeper into mysterious Flame Nebula
- **AAS Nova**, The First Y+Y Binary: Cool Brown Dwarfs Come in Pairs
- **Phys.org**, First Y brown dwarf binary system discovered
- **Interesting Engineering**, A stellar breakthrough: the first Y brown dwarf binary system unveiled
- **Nature Research Highlight**, They're a couple: JWST is first to spot pair of mysterious 'Y dwarfs'

Publications

First Author:

10. De Furio, M., Ygouf, M., Greenbaum, A., Rocha, G., Meyer, M.R., Beichman, C., Llop-Sayson, J., Roudier, G., Sallum, S., Leisenring, J., Sivaramakrishnan, A. , "Wavefront error recovery and companion identification with the James Webb Space Telescope", Proc. SPIE 13627, Techniques and Instrumentation for Detection of Exoplanets XII, 136270L, 18 September 2025, https://doi.org/10.1117/12.3065515.

9. De Furio, M., Faherty, J., Bardalez Gagliuffi, D.C., Gagne, J., Gonzales, E.C., Kiman, R., et al., "Discovery of the Second Y+Y Dwarf Binary System: CWISEP J193518.59-154620.3", 2025, ApJL, 990, L63.

8. De Furio, M., Gardner, T., Monnier, J.D., Meyer, M.R., Kratter, K.M., Lanthermann, C., Anugu, N., et al., "The Small Separation A-Star Companion Population: Tentative Signatures of Enhanced Multiplicity with Primary Mass", 2025, ApJ, 990, 54.

7. De Furio, M., Meyer, M.R., Greene, T., Hodapp, K., et al. "Identification of a turnover in the initial mass function of a young stellar cluster down to 0.5 M_J", 2025, ApJL, 981, L34.

6. De Furio, M., Lew, B., Beichman, C., Roellig, T., Bryden, G.., et al., "JWST Observations of the Enigmatic Y Dwarf WISE 1828+2650: I. Limits to a Binary Companion", 2023, ApJ, 948, 92D.

5. De Furio, M., Liu, C., Meyer, M.R., Reiter, M., Kraus, A., Dupuy, T., Monnier, J., "Demographics of the M-star Multiple Population in the Orion Nebula Cluster", 2022, ApJ, 941, 161.

4. De Furio, M., Gardner, T., Monnier, J., Meyer, M.R., Kratter, K., Schaefer G., Anugu, N., Davies, C.L., Kraus, S., Lanthermann, C., Le Bouquin, J.B., Ennis, J., "The Small Separation A-Star Companion Population: First Results with CHARA/MIRC-X", 2022, ApJ, 941, 118.

3. De Furio, M., Meyer, M.R., Reiter, M., Monnier, J., Kraus, A., & Dupuy, T., "Binary Formation in the Orion Nebula Cluster: Exploring the Sub-stellar Limit." 2022, ApJ, 925, 112.

2. De Furio, M., Reiter, M., Meyer, M.R., Greenbaum, A., Dupuy, T., Kraus, A., "A Search for Intermediate-separation Low-mass Binaries in the Orion Nebula Cluster." 2019, ApJ, 886, 95D.
1. De Furio, M., Ahn, S.J., Burne, R.A., Hagen, S.J. "Oxidative Stressors Modify the Response of *Streptococcus mutans* to Its Competence Signal Peptides." 2017, Applied Environmental Microbiology, 83.

Publications with Significant Contributions:
4. Mehta, K., **De Furio, M.,** Bardalez Gagliuffi, D., Dupuy, T., et al., "The Hubble Ultracool Multiplicity (HUM) Survey. I. Characterizing Sensitivity to Companions at Sub-Diffraction Limit Separations with HST WFC3/IR", 2026, AJ, 171, 56.
3. Roman Galactic Plane Survey Definition Committee, Benjamin, B., Street, R., Beaton, R., Carey, S., De, K., **De Furio, M.**, Drew, J., Kupfer, T., Minniti, D., Paladini, R., Schlafly, E., and Zucker, C., "Roman Galactic Plane Survey Definition Committee Report", 2025, arXiv:2511.07494.
2. Fontanive, C., Bedin, L., **De Furio, M.**, Biller, B., Anderson, J., Bonavita, M., Allers, K., Pantoja, B., "An HST survey of 33 T8 to Y1 brown dwarfs: NIR photometry and multiplicity of the coldest isolated objects", 2023, MNRAS, 526, 1783F.
1. Calissendorf, P., **De Furio M.**, et al., "JWST/NIRCam discovery of the first Y+Y brown dwarf binary: WISE J033605.05-014350.4", 2023, ApJ, 947L, 30C.

Other Co-authored Publications:
22. Lew B., Roellig T., Batalha N., Wogan N., Greene T., Marley M., Fortney J., et al. **(including De Furio M.)**, "JWST Spectral Retrieval of Cold Directly Imaged Planet WD 0806 b and the First Measurement of Altitude-dependent K$_{zz}$ in Exoplanet Atmospheres" 2026, AJ, 171, 227.
21. Adelman C., Sallum S., **De Furio M.**, and Eisner J., "First demonstration of kernel phase interferometry on JWST/MIRI: prospects for future planet searches around post main sequence stars", Proc. SPIE 13627, Techniques and Instrumentation for Detection of Exoplanets XII, 136270K (18 September 2025); https://doi.org/10.1117/12.3064694.
20. Albert L., Poulsen S., Le Bourdais E., Debes J., et al. **(including De Furio M.)**, "The MIRI Excesses around Degenerates (MEAD) Survey I: A candidate cold brown dwarf in orbit around the nearby white dwarf 2MASS J09424023-4637176", 2025, arxiv:2510.12601.
19. Bogat E., Schlieder J., Lawson K., et al. **(including De Furio M.)**, "Probing the Outskirts of M Dwarf Planetary Systems with a Cycle 1 JWST NIRCam Coronagraphy Survey", 2025, AJ, 170, 225.
18. Albert L., Leggett S.K., Calissendorff P., Vandal T., Kirkpatrick J.D., Bardalez Gagliuffi D.C., **De Furio M.**, et al., "JWST 1.5 μm and 4.8 μm Photometry of Y Dwarfs", 2025, AJ, 169, 163.
17. Barber, M., Mann, A., Vanderburg, A., Krolikowski, D., Kraus, A., et al. **(including De Furio M.)**, "A giant planet transiting a 3Myr protostar with a misaligned disk", 2024, *Nature* 635, 574–577.
16. Ray, S., Sallum, S., Hinkley, S., et al. **(including De Furio M.),** "The *JWST* Early Release Science Program for Direct Observations of Exoplanetary Systems III: Aperture Masking Interferometric Observations of the star HIP 65426 at 3.8μm", 2025, ApJL, 983, L25.

15. Blakely, D., Johnstone, D., Cugno, G., et al. **(including De Furio M.)**, “The James Webb Interferometer: Space-based interferometric detections of PDS 70 b and c at 4.8 μm”, 2025, AJ, 169, 137.
14. Langeveld A.B., Scholz A., Muzic K., Jayawardhana R., Capela D., Albert L., Doyon R., et al. **(including De Furio M.)**, “The JWST/NIRISS Deep Spectroscopic Survey for Young Brown Dwarfs and Free-Floating Planets”, 2024, AJ, 168, 179.
13. Lawson, K., Schlieder, J., Leisenring, J., et al. **(including De Furio M.)**, “JWST/NIRCam Detection of the Fomalhaut C Debris Disk in Scattered Light”, 2024, ApJL, 967, L8.
12. Lew, B., Roellig, T., Batalha, N., et al. **(including De Furio M.),** “High-precision Atmospheric Characterization of a Y Dwarf with JWST NIRSpec G395H Spectroscopy: Isotopologue, C/O Ratio, Metallicity, and the Abundances of Six Molecular Species”, 2024, AJ, 167, 237L.
11. Petrus, S., Whiteford, N., Patapis, P., et al. **(including De Furio M.),** “The JWST Early Release Science Program for Direct Observations of Exoplanetary Systems V: Do Self-Consistent Atmospheric Models Represent JWST Spectra? A Showcase With VHS 1256 b”, 2024, ApJ, 966L, 11P.
10. Sallum, S., Ray, S., Kammerer, J., et al. **(including De Furio M.),** “The JWST Early Release Science Program for Direct Observations of Exoplanetary Systems IV: NIRISS Aperture Masking Interferometry Performance and Lessons Learned”, 2024, ApJL, 963L, 2S.
9. Cugno, G., Zhou, Y., Thanathibodee, T., Calissendorff, P., et al. **(including De Furio M.),** “MagAO-X and HST High-contrast Imaging of the AS209 Disk at Hα”, 2023, AJ, 166, 162C.
8. Lawson, K., Schlieder, J., Leisenring, J., Bogat, E., et al., **(including De Furio M.),** “JWST/NIRCam Coronagraphy of the Young Planet-hosting Debris Disk AU Microscopii”, 2023, AJ, 166, 150L.
7. Greenbaum, A., Llop-Sayson, J., Lew, B., Bryden, G., Roellig, T., et al., **(including De Furio M.),** 2023, “First Observations of the Brown Dwarf HD 19467 B with JWST”, 2023, ApJ, 945, 126.
6. Kammerer J., Cooper R.A., Vandal T., Thatte D., Martinache F., Sivaramakrishnan A., Chaushev A., et al., **(including De Furio M.),** 2022, “The Near Infrared Imager and Slitless Spectrograph for JWST -- V. Kernel Phase Imaging and Data Analysis ”, 2023, PASP, 135, 014502.
5. Sivaramakrishnan, A., Tuthill, P., Lloyd, J., Greenbaum, A., et al., **(including De Furio M.)** 2022, “The Near Infrared Imager and Slitless Spectrograph for the James Webb Space Telescope -- IV. Aperture Masking Interferometry” 2023, PASP, 135, 015003.
4. Miles B.E., Biller B.A., Patapis P., Worthen K., Rickman E., Hoch K.K.W., Skemer A., et al., **(including De Furio M.)** 2022, “The JWST Early Release Science Program for Direct Observations of Exoplanetary Systems II: A 1 to 20 Micron Spectrum of the Planetary-Mass Companion VHS 1256-1257 b”, 2023, ApJL, 946, L6.
3. Carter A.L., Hinkley S., Kammerer J., Skemer A., Biller B.A., Leisenring J.M., Millar-Blanchaer M.A., et al. **(including De Furio M.)**, 2022, “The JWST Early Release Science Program for Direct Observations of Exoplanetary Systems I: High Contrast Imaging of the Exoplanet HIP 65426 b from 2-16 μm”, 2023, ApJ, 951L, 20C.

2. Hinkley S., Carter A.L., Ray S., Skemer A., Biller B., Choquet E., Millar-Blanchaer M.A., et al. **(including De Furio M.)**, "The JWST Early Release Science Program for the Direct Imaging and Spectroscopy of Exoplanetary Systems", 2022, PASP, 134, 095003.
1. Ygouf, M., Rocha, G., Beichman, C., Greenbaum, A., Leisenring, J., **De Furio, M.**, Meyer, M., et al., "Data processing for high-contrast imaging with the James Webb Space Telescope", 2020, SPIE, Volume 11443.