

Dax L. Feliz — Curriculum Vitae

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Vanderbilt University
PhD Candidate
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Education

Ph.D. Astrophysics, Vanderbilt University, expected 2022. Advisor: Dr. Keivan Stassun

M.S. Physics, Fisk University, 2018. Advisors: Drs. Keivan Stassun and Karen Collins

B.S. Astrophysics, University of Massachusetts at Amherst, 2013. Advisor: Dr. Min Yun



Research Interests

My research is focused on the detection of extra-solar planets that orbit cool, dim stars. I specialize in the use and data processing of transit photometry to search for these planets from ground and space based telescopes.



Research Experience

Transit Survey of M-Dwarf stars in TESS data, Vanderbilt University, TN 2018 – Present

PhD Thesis: Processing Full Frame Images to produce light curves, identify and remove instrumental systematics, conduct algorithmic periodic detection for potential transit events of orbiting planets.

PLATO Flare Removal Working Group, European Space Agency, 2020 – Present

Constructing an algorithm to detect and remove flare events from the photometric time series data that will be produced by the ESA PLATO mission for solar type stars.

Kilodegree Extremely Little Telescope (KELT), Vanderbilt University, TN 2017 – Present

Operating KELT data reduction pipeline for detection of transiting exoplanets orbiting bright, hot stars with a network of ground-based telescopes.

Multi-Year Transit Survey of Proxima Centauri, Fisk and Vanderbilt Universities, TN 2016 – 2019

Master's Thesis Project: Processing images from observations of the star Proxima Centauri, production and detrending analysis of light curves and utilization of periodic transit search algorithms to hunt for transit events of the Earth-sized planet, Proxima b.

Light Curve Analysis of high proper motion M-Dwarfs in Kepler data, American Museum of Natural History, NY 2012

REU Summer Project: Analysis and signal processing of photometry from the Kepler Space Telescope, conducted a search for transiting exoplanets and gravitational microlensing events. Advisor: Dr. Sebastine Lepine.

Using Spectropolarimetry to Study Extrasolar Planets, American Museum of Natural History, NY 2010

REU Summer Project: A theoretical project where I sought to answer if exoplanet atmospheres could be detected and characterized from ground-based telescopes. Advisors: Drs. Rebecca Oppenheimer & Douglas Brenner.



Mentoring Experience

Central American Caribbean Bridge Program

Project: Recovery of known TESS Objects of Interest from Full Frame Images of TESS observations, Spring 2020 – Spring 2021. Student: Bryan Villarreal Alvarado, University of Costa Rica.

Summer Research Internship

Project: Transiting Exoplanet Survey Satellite: A Search for New Worlds, Spring 2019 – Fall 2020. Student: Samantha Bianco, Vanderbilt University.

Summer Research Internship

Project: Blind Transit Survey of TESS Data for M Dwarf Systems, Summer 2019 – Fall 2020. Student: Mary Jimenez, George Mason University.

School for Science and Math at Vanderbilt

Project: Detecting exoplanet transits in TESS light curves, Spring 2019. Student: Felix Bean, Hunter's Lane High School.

East Harlem Tutorial Program, New York, NY, 2008 – 2010.

Tutored and mentored many high-school and middle school students in math, science and the college application process.



Teaching Experience

Teaching Assistant

ASTR-101L: Introductory Solar System Laboratory, Vanderbilt University, TN Fall semesters, 2018 – 2020.

ASTR-102L: Introductory Stars & Galaxies Laboratory, Vanderbilt University, TN Spring semesters, 2018 – Spring 2020.

Laboratory Technician / Teaching Assistant

Electronics Laboratory, Bronx Community College, NY Spring 2014 – Fall, 2015.



Outreach

East Harlem Scholar's Academy, New York, NY, Alumni Day Speaker, 2010 – 2015

- Answering questions of elementary school students about astronomy and physics and my research experience.

Central Park East High School, New York, NY, College Panel Speaker, 2009 – 2013

- Answering questions of high-school students about the my experiences in science and in higher education.

Central Park East High School, New York, NY, Robotics Consultant, 2009 – 2011

- Volunteered to assist high school students in the FIRST Robotics Competition.



Awards, Grants & Activities

Visiting Graduate Student Fellow at George Mason University, 2021 – Present.

NSF AGEP Fellowship, Spring 2021 – Present.

Fisk-Vanderbilt Bridge Fellowship, Fall 2018 – 2021.

McMinn Summer Research Award, 2018.

Graduate Opportunities at Fisk in Astronomy and Astrophysics Research (GO-FAAR) grant, 2016 – 2018.

New York Space Consortium Research Grant, Summer of 2012.

Invited Talks, Presentations, and Posters

“*Twinkle, Twinkle Little Star*”, Twinkle and the Next Generation of Exoplanet Scientists Conference, #29 September 2021.

“*NEMESIS: Exoplanet Transit Survey of Nearby M-dwarfs in TESS FFIS I*”, Center for Exoplanets & Habitable Worlds Seminar, Pennsylvania State University, #13, September 2021.

“*NEMESIS: Exoplanet Transit Survey of Nearby M-dwarfs in TESS FFIS I*”, TESS Science Conference II, August 2021. <http://doi.org/10.5281/zenodo.5115302>

“*NEMESIS: Exoplanet Transit Survey of Nearby M-dwarfs in TESS FFIS I*”, Rubin LSST Transients and Variable Stars Science Seminar, #21, June 2021.

“*NEMESIS: Exoplanet Transit Survey of Nearby M-dwarfs in TESS FFIS I*”, TESS Science Talk at Massachusetts Institute of Technology, and TESS Science Team Meeting #25, March 2021.

“*NEMESIS: Exoplanet Transit Survey of Nearby M-dwarfs in TESS FFIS I*”, Cool Stars 20.5 Conference Poster, March 2021. <http://doi.org/10.5281/zenodo.4562794>

“*A Multi-Year Transit Search of Proxima Centauri*”, Master’s Thesis Defense, Fisk University, August 2018.

“*A Multi-Year Transit Search of Proxima Centauri*”, ERES III conference, Yale University, June 2017 and the Sagan Summer Workshop, California Institute of Technology, August 2017.


“*Using BLS fitting on photometry of Proxima Centauri*”, KELT workshop, Lehigh University, June 2017.

“*How to deflect an incoming asteroid*”, University of Massachusetts at Amherst, May 2013.

“*Light Curve Characterization of High Proper Motion M-Dwarf Stars with the Kepler Space Telescope*”, Linder Theater in the American Museum of Natural History for the Annual REU Symposium, August 2012.

“*Using Spectropolarimetry to Study Extrasolar Planets*”, Linder Theater in the American Museum of Natural History for the Annual REU Symposium, August 2010.

Publication Metrics

h-index = 7 on 15 abstracts with 130 citations (via ADS).

Peer Reviewed Publications (1st Author)

1. **Dax L. Feliz**, Peter Plavchan, Samantha N. Bianco, Mary Jimenez, Kevin I. Collins, Bryan Villarreal Alvarado, and Keivan G. Stassun. NEMESIS: Exoplanet Transit Survey of Nearby M-dwarfs in TESS FFIs. I. *The Astronomical Journal*, 161(5):247, May 2021
2. **Dax L. Feliz** L., David L. Blank, Karen A. Collins, and ... A Multi-year Search for Transits of Proxima Centauri. II. No Evidence for Transit Events with Periods between 1 and 30 days. *The Astronomical Journal*, 157(6):226, Jun 2019
3. David L. Blank, **Dax L. Feliz** , Karen A. Collins, and ... A Multi-year Search for Transits of Proxima Centauri. I. Light Curves Corresponding to Published Ephemerides. *The Astronomical Journal*, 155(6):228, Jun 2018** **Corresponding author**

Peer Reviewed Publications (Nth Author)

1. Christina Hedges, Alex Hughes, George Zhou, ..., **D. L. Feliz**, and ... TOI-2076 and TOI-1807: Two Young, Comoving Planetary Systems within 50 pc Identified by TESS that are Ideal Candidates for Further Follow Up. *The Astronomical Journal*, 162(2):54, August 2021
2. Keivan G. Stassun, Guillermo Torres, Cole Johnston, ..., **Dax L. Feliz**, and ... Discovery and Characterization of a Rare Magnetic Hybrid β Cephei Slowly Pulsating B-type Star in an Eclipsing Binary in the Young Open Cluster NGC 6193. *The Astrophysical Journal*, 910(2):133, April 2021

3. S. A. Rappaport, D. W. Kurtz, G. Handler, ..., **D. L. Feliz**, and ... A tidally tilted sectoral dipole pulsation mode in the eclipsing binary TIC 63328020. *Monthly Notices of the Royal Astronomical Society*, February 2021
4. Joseph E. Rodriguez, Samuel N. Quinn, George Zhou, ..., **Dax L. Feliz**, and ... TESS Delivers Five New Hot Giant Planets Orbiting Bright Stars from the Full-frame Images. *The Astronomical Journal*, 161(4):194, April 2021
5. Joni-Marie C. Cunningham, **Dax L. Feliz**, Don M. Dixon, and ... A KELT-TESS Eclipsing Binary in a Young Triple System Associated with the Local “Stellar String” Theia 301. *The Astrophysical Journal*, 160(4):187, October 2020
6. Peter Plavchan, Thomas Barclay, Jonathan Gagné, ... **Dax Feliz** , and ... A planet within the debris disk around the pre-main-sequence star AU Microscopii. *Nature*, 582(7813):497–500, June 2020
7. Romy Rodríguez Martínez, B. Scott Gaudi, Joseph E. Rodriguez, ..., **Dax L. Feliz** , and ... KELT-25 b and KELT-26 b: A Hot Jupiter and a Substellar Companion Transiting Young A Stars Observed by TESS. *The Astronomical Journal*, 160(3):111, September 2020
8. Weicheng Zang, Subo Dong, Andrew Gould, ..., **Dax L. Feliz** , and ... Spitzer + VLTI-GRAVITY Measure the Lens Mass of a Nearby Microlensing Event. *arXiv e-prints*, page arXiv:1912.00038, Nov 2019
9. Joseph E. Rodriguez, Jason D. Eastman, George Zhou, ..., **Dax L. Feliz** , and ... KELT-24b: A $5M_J$ Planet on a 5.6 day Well-aligned Orbit around the Young $V = 8.3$ F-star HD 93148. *The Astronomical Journal*, 158(5):197, Nov 2019
10. Steven Villanueva, Diana Dragomir, Chelsea X. Huang, ..., **Dax L. Feliz** , and ... Searching for Long-Period Planets in TESS. In *AAS/Division for Extreme Solar Systems Abstracts*, volume 51 of *AAS/Division for Extreme Solar Systems Abstracts*, page 302.19, Aug 2019
11. Jonathan Labadie-Bartz, Joseph E. Rodriguez, Keivan G. Stassun, ..., **Dax L. Feliz** , and ... KELT-22Ab: A Massive, Short-Period Hot Jupiter Transiting a Near-solar Twin. *The Astrophysical Journal*, 240(1):13, Jan 2019
12. Karen A. Collins, Kevin I. Collins, Joshua Pepper, ..., **Dax L. Feliz** , and ... The KELT Follow-up Network and Transit False-positive Catalog: Pre-vetted False Positives for TESS. *The Astronomical Journal*, 156(5):234, Nov 2018