

Dax L. Feliz | Curriculum Vitae

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Vanderbilt University

PhD Candidate

Department of Physics & Astronomy

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Education

Ph.D. Astrophysics, Vanderbilt University, expected 2022.

M.S. Physics, Fisk University, 2018.

B.S. Astrophysics, University of Massachusetts at Amherst, 2013.

Research Interests

My research is focused on the detection of extrasolar planets that orbit cool, dim stars. I specialize in the use and data processing of transit photometry to search for planets.

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.

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

Operating KELT data reduction pipeline for detection of transiting exoplanets orbiting bright, hot stars.

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.

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.

Mentoring Experience

Central American Caribbean Bridge Program

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

Summer Research Internship

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

Summer Research Internship

Project: Transiting Exoplanet Survey Satellite: A Search for New Worlds, Summer 2019 – Present.
 Student: Samantha Bianco, Vanderbilt 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**

Introductory Astronomy Laboratory, Vanderbilt University, TN Fall 2018 – Present.

Laboratory Technician/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 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

Fisk-Vanderbilt Bridge Fellowship, Fall 2018 – Present.

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.

Presentations and Talks

"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 = 4 on 12 abstracts with 53 citations (via ADS).

1st and Corresponding Authored Papers

1. **Dax L. Feliz** L., David L. Blank, Karen A. Collins, Graeme L. White, Keivan G. Stassun, 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
2. David L. Blank, **Dax L. Feliz** , Karen A. Collins, Graeme L. White, Keivan G. Stassun, Ivan A. Curtis, Rhodes Hart, John F. Kielkopf, Peter Nelson, Howard Relles, Christopher Stockdale, Band upriya Jayawardene, Carlton R. Pennypacker, Paul Shankland, Daniel E. Reichart, Joshua B. Haislip, and Vladimir V. Kouprianov. A Multi-year Search for Transits of Proxima Centauri. I. Light Curves Corresponding to Published Ephemerides. *The Astronomical Journal*, 155(6):228, Jun 2018

Nth Authored Papers

1. Romy Rodríguez Martínez, B. Scott Gaudi, Joseph E. Rodriguez, ..., **Dax L. Feliz** , and ... KELT-25b and KELT-26b: A Hot Jupiter and a Substellar Companion Transiting Young A-stars Observed by TESS. *arXiv e-prints*, page arXiv:1912.01017, Dec 2019
2. 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
3. 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
4. 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
5. 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
6. 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