

# JOSEPH M. AKANA MURPHY

*Updated April 14, 2021*

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## SCIENTIFIC INTERESTS

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Exoplanet characterization and formation, applications of statistical modeling and machine learning

## EDUCATION

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### University of California, Santa Cruz

*Ph.D.* in Astronomy and Astrophysics

2019 - Expected 2024

Advisor: Professor Natalie Batalha

### Stanford University

*Master of Science* in Applied and Engineering Physics

2018 - 2019

*Bachelor of Science* in Physics

2014 - 2018

Minor in Mathematics

Advisors: Professor Bruce Macintosh, Dr. Ian Czekala

Thesis: *Inferring the Veiling Spectrum of the Pre-Main Sequence Star LkCa 15 with Gaussian Processes*

## SCIENTIFIC RESEARCH

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### Prioritizing *TESS* Targets for Atmospheric Characterization

2019 - present

A prioritization scheme to systematically search for the *TESS* targets that are best-suited for atmospheric follow-up with *JWST*.

### The *TESS*-Keck Survey

2019 - present

Observing and analysis support for the *TESS*-Keck Survey, a multi-institution collaboration with the goal of measuring the orbits and masses of 100 *TESS* planets with Keck-HIRES.

### Unveiling the Spectra of Young Stars with Gaussian Processes

2017 - 2019

Using Gaussian processes to model time-series spectroscopic observations of a young star, LkCa 15, we disentangle the stellar atmosphere from the spectrum of accretion, revealing time-variable, line-specific emission related to the infalling material.

## HONORS AND AWARDS

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National Science Foundation Graduate Research Fellowship

2019 - present

LSST Corporation Data Science Fellowship

2019 - present

Regents' Fellowship, University of California, Santa Cruz

Fall 2019, Winter 2020

Conference Travel Grant, Stanford University

2017

Thomas J. Watson Memorial Scholarship, IBM

2014 - 2018

## PROFESSIONAL EXPERIENCE

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### Graduate Student

Department of Astronomy and Astrophysics, University of California, Santa Cruz

2019 - present

### Research Assistant

Kavli Institute for Particle Astrophysics and Cosmology, Stanford University

2017 - 2019

### Research and Development Intern

Pathfinder Systems, Inc., Denver, CO

Summer 2016

## PUBLICATIONS ([NASA ADS SEARCH RESULTS](#))

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### First-author publications

1. **Murphy, J. M. A.** *et al.* “Another super-dense sub-Neptune in K2-182 b and refined mass measurements for K2-199 b and c.” Submitted, March 2021.

### Many-author publications

6. Rubenzahl, R. *et al.* **including Murphy, J. M. A.** “The TESS-Keck Survey IV: A Retrograde, Polar Orbit for the Ultra-Low-Density, Hot Super-Neptune WASP-107b.” *The Astronomical Journal*, 161, 119, 2021.
5. Weiss, L. *et al.* **including Murphy, J. M. A.** “The TESS-Keck Survey II: An Ultra-Short Period Rocky Planet and its Siblings Transiting the Galactic Thick-Disk Star TOI-561.” *The Astronomical Journal*, 161, 56, 2021.
4. Kosiarek, M. *et al.* **including Murphy, J. M. A.** “Physical Parameters of the Multi-Planet Systems HD 106315 and GJ 9827.” *The Astronomical Journal*, 161, 47, 2021.
3. Fei, D. *et al.*, **including Murphy, J. M. A.** “The TESS-Keck Survey. III. A Stellar Obliquity Measurement of TOI-1726 c.” *The Astronomical Journal*, 160, 4, 2020.
2. Cloutier, R. *et al.* **including Murphy, J. M. A.** “TOI-1235 b: A Keystone Super-Earth for Testing Radius Valley Emergence Models around Early M Dwarfs.” *The Astronomical Journal*, 160, 1, 2020.
1. Dalba, P. *et al.* **including Murphy, J. M. A.** “The TESS-Keck Survey. I. A Warm Sub-Saturn-mass Planet and a Caution about Stray Light in TESS Cameras.” *The Astronomical Journal*, 159, 5, 2020.

## ADVISING AND TEACHING EXPERIENCE

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### Students advised

Ms. Bronwen Hardee, UCSC undergraduate	June 2020 - January 2021
Constructing a high-fidelity exoplanet mass and radius catalog.	

### Volunteer Instructor

<i>Introduction to Astronomy Research</i>	Summer 2020
(See <a href="https://github.com/howardisaacson/Intro-to-Astro-2020">github.com/howardisaacson/Intro-to-Astro-2020</a> )	

### Teaching Assistant

Astronomy 119: <i>Introduction to Scientific Computing</i> , UCSC	Spring 2020
Physics 43: <i>Electricity and Magnetism</i> , Stanford University	Spring 2019
Physics 41: <i>Mechanics</i> , Stanford University	Winter 2019
Physics 41A: <i>Mechanics</i> , Stanford University	Winter 2018

### Course Instructor

Physics 91SI: <i>Practical Computing for Scientists</i> , Stanford University	Spring 2017
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## OBSERVING EXPERIENCE

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10-meter Keck I telescope (HIRES) - 30 half nights	January 2020 - present
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## ACADEMIC PRESENTATIONS

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### Talks

2. *The TESS-Keck Survey: Building a Statistical Sample of Sub-Neptunes Primed for Atmospheric Characterization*, TESS Science Team Meeting #25, 2021 March 25.

1. *The TESS-Keck Survey: Building a Statistical Sample of Sub-Neptunes Primed for Atmospheric Characterization*, Bay Area Exoplanet Meeting #36, 2021 March 5.

## Posters

2. *Inferring the spectrum of accretion onto LkCa 15 with Gaussian Processes*, [AAS Meeting 233](#), poster 360.19, 2019.
1. *Disentangling spectra of young stars*, [AAS Meeting 233](#), poster 339.08, 2018.

## OUTREACH

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### Invited Public Talks

2. *Exoplanets: Detecting and Characterizing Worlds Beyond the Solar System*, Morristown High School (NJ) STEM Academy Meeting, 2021 April 7.
1. *Piecing Together the Universe with Generative Models*, Astronomy on Tap - Santa Cruz, 2020 March 5.