PhD Student
University of Washington
https://jbirky.github.io/ ☞

Jessica Birky

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Research Interests: Stars, binary stars, stellar populations. Stellar and planetary dynamics. Large scale surveys, data analysis and modeling, machine learning and data-driven models.

EDUCATION

PhD Astronomy (Data Science Program), University of Washington – Seattle   2021 — Present
MS Astronomy, University of Washington – Seattle   2019 — 2021
BS Physics, University of California – San Diego   2015 — 2019

RESEARCH EXPERIENCE

Graduate Student Researcher – University of Washington, Seattle WA   Aug 2020 – Present
VPLanet Group; Advisor: Rory Barnes

Graduate Student Researcher – University of Washington, Seattle WA   Aug 2019 – Present
DIRAC Institute; Advisor: James Davenport

Undergraduate Researcher – University of California San Diego, La Jolla CA   May 2016 – May 2019
Cool Star Lab; Advisor: Adam Burgasser

Research Intern – Max Planck Institute für Astronomie, Heidelberg DE   Summer 2017 & 2018
Stars & Milky Way groups; Advisor: David Hogg

SELECTED AWARDS & HONORS

2019 – 2024	NSF Graduate Research Fellowship
2022	UW Astronomy Jacobsen Award
2018, 2019	UC San Diego Provost Honors
2017, 2018	Max Planck Institute Fellowship
2017	Frances Hellman Research Scholarship
2016 – 2018	Physics Chair Challenge Award

PUBLICATIONS

First-author Papers:

- **Birky, J.**, Barnes, R. K., 2023, *Prospects of Constraining Tidal Dissipation in Binary Stars* (In prep, 2023)

- **Birky, J.**, Barnes, R. K., Fleming, D. P., 2021, *Improved Constraints for Trappist-1 XUV Luminosity Evolution*, RNAAS, 5, 122 (arXiv:2105.12562) [paper ☞] [code ☞]

- **Birky, J.**, Hogg, D. W., Mann, A., Burgasser, A. J., 2020, *Temperatures and Metallicities for M dwarfs in the APOGEE Survey*, ApJ, 892, 1 (arXiv:2001.04962) [paper ☞] [code ☞]

Co-author Papers:

- Barnes, R. K., Amaral L., **Birky J.**, et. al 2022, *History and Habitability of the LP 890-9 Planetary System* (In prep)

- Hsu, C., Burgasser, A. J., et. al (incl. **Birky, J.**) 2022, *Ultracool Dwarf Radial and Rotational Velocity Survey with SDSS/APOGEE High-Resolution Spectrometer* (Submitted ApJ)

- Hsu, C., Burgasser, A. J., et. al (incl. **Birky, J.**) 2021, *The Brown Dwarf Kinematics Project (BDKP). V. Radial and Rotational Velocities of T Dwarfs From Keck/NIRSPEC High-Resolution Spectroscopy* (arXiv:2107.01222) [paper ☞] [code ☞]

- Davenport, J. R. A., Windemuth, D., et. al (incl. **Birky, J.**) 2021, *The Rise and Fall of the Eclipsing Binary, HS Hydra*, ApJL (arXiv:2107.10954) [paper ☞]

- Martin, D. V., El-Badry, K., et al. (incl. **Birky, J.**) 2021, *TOI-1259Ab–a gas giant with 2.6% deep transits and a bound white dwarf companion*, MNRAS (arXiv:2101.02707) [paper ☞]

- Burgasser, A. J., Splat Development Team (incl. **Birky, J.**), *The SpeX Prism Library Analysis Toolkit (SPLAT): A Data Curation Model*, Bull. Astr. Soc. India, 00, 1-6, 2017 (https://arxiv.org/abs/1707.00062)

Posters:

- **Birky, J.**, Barnes, R. K., Davenport, J.R.A. (2023 Jan). *Challenges in Establishing an Accurate Model of Tidal Dissipation for Low-mass Binary Stars.* Poster presentation at AAS 241, Seattle WA

- **Birky, J.**, Barnes, R. K., Fleming, D. P. (2022 July). *Constraining the XUV Luminosity Evolution of Low Mass Stars.* Poster presentation at Cool Stars 21, Toulouse France

- **Birky, J.**, Davenport, J. R. A, Brandt, T. (2020 January). *Systematic Classification of TESS Eclipsing Binaries.* Poster presentation at AAS Meeting 235, Honolulu HI [poster ↗]

- **Birky, J.**, Hogg, D. W., Mann, A. W., Burgasser, A. (2019 January). *Precise Stellar Parameters for 10,000+ APOGEE M dwarfs.* Poster presentation at AAS Meeting 233, Seattle WA [poster ↗]

- **Birky, J.**, Hogg, D. W., Burgasser, A. (2018 January). *Data-Driven Spectral Models for APOGEE M Dwarfs.* Poster presentation at AAS Meeting 231, Washington DC [poster ↗]

- **Birky, J.**, Aganze, C., Burgasser, A., Theissen, C., Schmidt, S., Stassun, K., Teske, J., Bird, J. (2017 January). *Modeling Stellar Parameters for High Resolution Late-M and Early-L Dwarf SDSS/APOGEE Spectra.* Poster presentation at AAS Meeting 229, Grapevine TX [poster ↗]

- **Birky, J.**, Aganze, C., Burgasser, A., Theissen, C., Schmidt, S., Stassun, K., Teske, J. (2016 October). *Identification of H-band Absorption Lines in High Resolution APOGEE Spectra of the Lowest Mass Stars.* Poster presentation at the national SACNAS Conference, Long Beach CA

Talks

Prospects of Constraining Tidal Dissipation of Low-mass Stars   2023
DDA Meeting 54, Lansing, Michigan

(Invited) Precise abundances of M dwarfs: data driven models applied to large scale surveys   2022
Cool Stars 21, Toulouse, France

ALABI: Active Learning for Accelerated Bayesian Inference   2021
IAU Symposium 362 – Predictive Power of Computational Astrophysics, Virtual Conference

Physical Parameters for 10,000+ M dwarfs in the APOGEE Survey   2019
Sloan Digital Sky Survey Collaboration Meeting, Ensenada, Mexico

Data Driven Models for APOGEE M dwarfs   2017
Stars Meeting & Milky Way Meeting, MPIA, Heidelberg, Germany

Telescope Time Awarded

TESS Eclipsing Binaries in Open Clusters Survey   2022 – 2023
PI: **APO 3.5 meter** – 16 total half nights with ARCES/KOSMOS spectrographs

Training the Cannon: Calibrating APOGEE Observations of Ultracool Dwarfs   2018 – 2019
Co-I: **NASA IRTF** – 6 nights with iShell spectrograph (PI: Adam Burgasser)

APOGEE-2 Survey of the Lowest-Mass Stars and Brown Dwarfs: Composition, Chemistry and Companions   2017 – 2018
Co-I: **APOGEE 2.5-meter** – Fibers for ancillary survey (PI: Adam Burgasser)

Observing Experience

Apache Point Observatory 3.5m

6 half nights (remote), Instruments: ARCES & KOSMOS	Q1 2023
8 half nights (remote), Instruments: ARCES & KOSMOS	Q4 2022
4 half nights (onsite), Instruments: ARCES, KOSMOS, ARCTIC	Q3 2022
2 half nights (remote), Instruments: ARCES & KOSMOS	Q2 2022
2 half nights (remote), Instruments: ARCES, TripleSpec, DIS, NICFPS, ARCTIC	Q4 2020

Research Mentoring

Marshall Hobson-Ritz (UW post-bac)	Jan 2023 – Present
Leah Peterson (UW undergrad, PreMAP program)	Nov 2022 – Present
John Delker (UW undergrad, PreMAP program)	Nov 2022 – Dec 2022
Peter Gwartney (UW undergrad; now PhD student University of Alabama)	Jun 2021 – Sept 2022
Rachel Wong (UW undergrad, graduate 2022)	Jun 2021 – Sept 2022

Teaching Experience

Lead weekly lab/discussion sections & held office hours for classes with up to 90 enrolled students in intro Astronomy courses.

ASTR 150: The Planets (Instructor: Nicole Kelly)	Spring 2021
ASTR 150: The Planets (Instructors: Nicole Kelly, Eric Agol)	Winter 2021
ASTR 102: Introduction to Astronomy (Instructor: Scott Anderson)	Fall 2020

Selected Service and Outreach

Yakima Valley CC scientific computing bootcamp – Assistant Instructor	Spring 2023
Astronomy on Tap Seattle – Livestream Manager	Fall 2022 – Present
Apache Point Observatory – Telescope Allocation Committee	Fall 2020 – Present
AAS Foundations of astronomical data science workshop – volunteer helper	Jan 2023
Yakima Valley CC – Outreach talk: Research in modern Astronomy	Nov 2022
UW Pre-Map program – Research Mentor	Fall 2022
VPLanet Workshop – SOC and Session Lead	Sept 2022

Professional Development

Cool Stars 20.5 – *Virtual Conference*	Mar 2021
NExSS Quantitative Habitability Science Workshop – *Online workshop*	Dec 2020
online.tess.science – *Online workshop*	Sep 2020
TESS Ninja 3: Expanding the Science of TESS – *Sydney, Australia*	Feb 2020
ZTF Collaboration Meeting – *UW Seattle, WA*	Sept 2019
Caltech FUTURE of Physics Workshop – *Pasadena, CA*	Nov 2018
M33 HST Survey Meeting – *Ringberg Castle, Tegernsee, Germany*	Jul 2018
Conference for Undergraduate Women in Physics – *Cal Poly Pomona, CA*	Jan 2018
Gaia Sprint – *Internationales Wissenschaftsforum Heidelberg, Germany*	Jul 2017
Conference for Undergraduate Women in Physics – *UC Los Angeles, CA*	Jan 2017

Professional Affiliations

American Astronomical Society (AAS) Member	2016 – Present
Society for the Advancement of Chicanos and Native Americans in Science	2016 – Present
Sloan Digital Sky Survey (SDSS) – Faculty and Student Team (FAST) Member	2016 – 2019

Graduate Coursework

Radiative Processes, Thermo/hydrodynamics, Stellar Structure and Evolution, Explanets, Interstellar & Intergalactic Medium, Galactic Structure & Dynamics, Astrostatistics, Machine Learning

References

Prof. Rory Barnes (UW/VPL) – PhD advisor	rkb9@uw.edu
Prof. James Davenport (UW/DIRAC) – PhD co-advisor	jrad@uw.edu
Prof. Adam Burgasser (UCSD) – undergrad research advisor	aburgasser@ucsd.edu
Prof. David Hogg (NYU/MPIA/Flatiron) – undergrad research advisor	david.hogg@nyu.edu