

# Brenna Mockler

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&

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## Education

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UNIVERSITY OF CALIFORNIA, SANTA CRUZ

Ph.D, Astronomy & Astrophysics

June 2022

M.Sc., Astronomy & Astrophysics

December 2018

CORNELL UNIVERSITY

B.A. Physics and College Scholar

May 2016

## Research Appointments

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Assistant Professor of Physics & Astronomy, UC Davis

2025 - present

Carnegie Theoretical Astrophysics Center Postdoctoral Research Fellow

2023 - present

UCLA Chancellor's Postdoctoral Research Fellow

2022

## Selected Awards & Fellowships

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HEAD Dissertation Prize Honorable Mention

2023

AAUW American Dissertation Fellowship

2021-2022

UC Santa Cruz President's Dissertation Year Fellowship

2021-2022

Denice Denton Excellence in Research Award

2021

NSF Graduate Research Fellowship Honorable Mention

2018

UC Santa Cruz Astronomy Award for Excellence in Mentoring

2017-2018

UC Santa Cruz Chancellor's Fellowship

2016 - 2017

UC Santa Cruz Regents' Fellowship

2016 - 2017

Member of Mortar Board Der Hexenkreis Senior Honor Society

2016 - present

## Research Grants (PI)

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NASA Swift Cycle 17 Guest Investigator Grant

2021-2022

## Invited Talks

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EAS (Cork) – review talk

2025

*'Exploring galactic nuclei with tidal disruption events'*

QPEs and Repeating Transients in Madrid (ESAC) - review talk

2025

*'Constraining stars & SMBHs with Tidal Disruption Events'*

Astrophysical Dynamics Copenhagen (Niels Bohr Institute) <i>'Stars &amp; SMBHs in galactic nuclei: Tidal Disruption Events &amp; Stellar Collisions'</i>	2025
Sexten Workshop <i>'TDE light curves from emission to observations'</i>	2025
Carnegie Mellon Seminar <i>'Lighting up Supermassive Black Holes'</i>	2025
University of Hawaii Colloquium <i>'Lighting up Supermassive Black Holes'</i>	2025
Penn State Colloquium <i>'Lighting up Supermassive Black Holes'</i>	2025
UC San Diego Seminar <i>'Exploring galactic nuclei with tidal disruption events'</i>	2024
UC Davis Colloquium <i>'Lighting up Supermassive Black Holes'</i>	2024
University of Michigan Colloquium <i>'Exploring galactic nuclei with tidal disruption events'</i>	2024
UC Davis Cosmology and Astronomy Seminar <i>'Exploring galactic nuclei with tidal disruption events'</i>	2024
Tidal Disruption Events and Nuclear Transients: Entering the Data-Rich Era (Crete) <i>'TDE light curves from emission to observations'</i>	2024
Rise_Time 2024 (Purdue) <i>'Exploring galactic nuclei with tidal disruption events'</i>	2024
Anticipating the Rising Tide of TDEs: Theory and Observations (KITP blackboard talk) <i>'Lighting up Supermassive Black Holes with TDEs'</i> , watch <a href="#">here</a>	2024
HEAD Dissertation Prize talk <i>'Exploring galactic nuclei with tidal disruption events'</i>	2024
UC Berkeley TAC Seminar <i>'TDEs as probes of SMBH binaries &amp; stellar populations in galactic nuclei'</i>	2024
Monash University Colloquium <i>'Exploring galactic nuclei with tidal disruption events'</i>	2024
Loss Cones in Como – review talk <i>'TDEs: theory and observations'</i>	2024
Flares and Bursts in Galactic Nuclei (IAS) <i>'Finding hidden massive black hole binaries and repeated TDEs with the eccentric Kozai-Lidov mechanism'</i>	2023
Institute for Advanced Study Seminar <i>'Exploring galactic nuclei with tidal disruption events'</i>	2023

19th High Energy Astrophysics Division meeting <i>'Exploring galactic nuclei with tidal disruption events'</i>	2022
Caltech TAPIR seminar <i>'Exploring galactic nuclei with tidal disruption events'</i>	2021
University of Melbourne Colloquium <i>'Exploring galactic nuclei with tidal disruption events'</i>	2021
TDEs in the Golden Age of Time Domain Astronomy – 235th AAS Meeting <i>'Weighing Black Holes with Tidal Disruption Events'</i>	2020
University of Nova Gorica Colloquium <i>'Weighing Black Holes with Tidal Disruption Events'</i>	2019
DARK Institute for Cosmology <i>'The future of Black Hole population studies'</i>	2018

## Mentoring & Advising

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**Research Mentor** - UCLA & Carnegie Observatories 2020 - current  
I am one of the primary research mentors for a UCLA Ph.D. student (Denyz Melchor). We have published three papers together and are working on a fourth.

**Carnegie CASSI Program** - Carnegie Observatories 2023 - current  
*Project advisor & mentor*  
The Carnegie CASSI program provides summer research opportunities for undergraduate students from local California schools. I have been part of the mentoring teams for 4 summer students, and I am currently the primary science mentor for one student.

**Lamat REU program** - UC Santa Cruz 2020 - 2022  
*Project advisor*  
I was the primary advisor for an REU student (Angela Twum, current Ph.D. student at UC Santa Cruz). Our work together led to a published paper.

**Thesis advisor** - UC Santa Cruz 2016 - 2020  
Primary advisor to undergraduate student (Michael Miller, B.S. UC Santa Cruz, 2020). Thesis project: "The phase space of astronomical transients".

**AY9: Introduction to Research in Astronomy** - UC Santa Cruz 2016 - 2017  
*Project advisor*  
As part of an intro to research class aimed at students from under-resourced and minority backgrounds, I lead a group of students in an original research project which they presented to the department at the end of the year.

**Women in Physics and Astronomy Group** - UC Santa Cruz 2016 - 2022  
*Mentor*  
General academic mentor to undergraduate students through WiPA program. This has included editing students' applications, connecting students with potential research advisors, and helping

students navigate general on campus resources.

## Outreach Activities

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**Carnegie CASSI Program** - Carnegie Observatories 2023 - current  
*Workshop Leader*

In addition to the mentoring described above, I have also led workshops for the CASSI program on writing abstracts, building community in astronomy, and presenting research.

**Letters to a Pre-Scientist** 2024 - current  
*Pen pal*

I am a pen pal to school-age children from under-resourced schools to help them learn about what careers in STEM look like.

**KITP Teacher's Conference** - KITP 2024  
*Talk*

I gave a talk to high school science teachers about tidal disruption events and transients.

**Lamat REU Program** - UC Santa Cruz 2020 - 2022  
*Workshop Leader*

The Lamat REU program is focused on increasing the retention of diverse students in astronomy and planetary science, and recruits from local community colleges. I lead workshops for the program on research methods in astrophysics, aimed at students who are learning to code in Python.

**Astro on Tap, Science on Tap** - Santa Cruz 2020 - 2022  
I give public, informal public talks on my research (watch example [here](#)).

**Women in Physics & Astronomy Group** - UC Santa Cruz 2016 - 2022  
*Talk Chair*

As a chair of the WiPA group at UCSC, I organize outreach and community building events. In particular, I organize and lead discussions with visiting scientists and UCSC undergraduate and graduate students on life in academia, common challenges faced, and advice for students.

**Undergraduate Women in Physics Group** - Cornell University 2015 - 2016  
*Founder of UWIP at Cornell*

I organized and procured for funding for community building activities for women in physics at Cornell with the goal of increasing retention rates in the undergraduate physics program.

## Recent Press Releases

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Astronomical breakthrough reveals star that survived destructive encounter with black hole  
<https://www.eurekalert.org/news-releases/1091862> 2025

Chandra Studies a Moderately Massive Star Destroyed by a Giant Black Hole In Another Galaxy  
<https://chandra.harvard.edu/blog/node/855> 2023

## Publications

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*Summary: 31 published, 1 in press, 2 in review (6 second author, 6 first author)*

**Mockler, B.**, Coughlin, E., Hammerstein, & E., Nicholl, M. 2025, in press (Elsevier)

*Encyclopedia of Astrophysics: Tidal Disruption Events*

Melchor, D., et al. inc. **Mockler, B.**, 2025, [submitted to ApJ](#)

*Tidal Disruption Event Demographics in Supermassive Black Hole Binaries Over Cosmic Times*

Li, W. -X., et al. inc. **Mockler, B.**, 2025, [submitted to Nature Astronomy](#)

*An extremely soft and weak fast X-ray transient associated with a luminous supernova*

Makrygianni, L., et al. inc. **Mockler, B.**, 2025, [ApJL, 987, 1](#)

*The Double Tidal Disruption Event AT 2022dbl Implies That at Least Some "Standard" Optical TDEs are Partial Disruptions*

Piro, T. & **Mockler, B.**, 2025, [ApJ, 985, 77](#)

*Late-time Evolution and Instabilities of Tidal Disruption Disks*

Rose, S. & **Mockler, B.**, 2025, [ApJL, 985, 40](#)

*On the Orbital Effects of Stellar Collisions in Galactic Nuclei: Tidal Disruption Events and Ejected Stars*

Earl, N., et al. inc. **Mockler, B.**, 2025, [ApJ, 983, 28](#)

*AT 2020nov: Evidence for Disk Reprocessing in a Rare Tidal Disruption Event*

Gibson, C., et al. inc. **Mockler, B.**, 2025, [ApJ, 980, 109](#)

*Formation of Stripped Stars From Stellar Collisions in Galactic Nuclei*

**Mockler, B.**, et al. 2024, [ApJL, 973, 9](#)

*Tidal Disruption Events from Stripped Stars*

Xiang, X., et al. inc. **Mockler, B.**, 2024, [ApJ, 973, 9](#)

*Investigating the Mass of the Black Hole and Possible Wind Outflow of the Accretion Disk in the Tidal Disruption Event AT2021ehb*

Melchor, D., **Mockler, B.**, et al. 2024, [ApJ, 960, 39](#)

*Tidal Disruption Events from the Combined Effects of Two-Body Relaxation and the Eccentric Kozai-Lidov Mechanism*

**Mockler, B.**, et al. 2023, [ApJ, 959, 18](#)

*Uncovering Hidden Massive Black Hole Companions with Tidal Disruption Events*

Miller, J., **Mockler, B.**, et al. 2023, [ApJL, 953, 2](#)

*Evidence of a Massive Stellar Disruption in the X-Ray Spectrum of ASASSN-14li*

Kremer, K., **Mockler, B.**, et al. 2023, [MNRAS, 524, 4](#)

*Wind-reprocessed transients from stellar-mass black hole Tidal Disruption Events*

Wiseman, P., et al. inc. **Mockler, B.**, 2023, [MNRAS, 522, 3](#)

*Multiwavelength observations of the extraordinary accretion event AT2021lwx*

- Angus, C.R., et al. inc. **Mockler, B.**, 2023, [Nature Astronomy](#), **6**, 1452  
*A fast-rising tidal disruption event from a candidate intermediate-mass black hole*
- Liu, C., **Mockler, B.**, et al., 2022, [ApJ](#), **944**, 184  
*Tidal disruption events from eccentric orbits and lessons learned from the noteworthy ASASSN-14ko*
- Nicholl, M., et al. inc. **Mockler, B.**, 2022, [MNRAS](#), **515**, 4  
*Systematic light curve modelling of TDEs: statistical differences between the spectroscopic classes*
- Naoz, S., et al. inc. **Mockler, B.**, 2022, [ApJ](#), **927**, 18  
*The Combined Effects of Two-body Relaxation Processes and the Eccentric Kozai-Lidov Mechanism on the Extreme-mass-ratio Inspirals Rate*
- Mockler, B.**, et al. 2022, [ApJ](#), **924**, 70  
*Evidence for the preferential disruption of moderately massive stars by supermassive black holes*
- Gagliano, A., et al. inc. **Mockler, B.**, 2021, [ApJ](#), **924**, 55  
*An Early-Time Optical and Ultraviolet Excess in the type-Ic SN 2020oi*
- Hung, T., et al. inc. **Mockler, B.**, 2021, [ApJ](#), **917**, 9  
*Discovery of a Fast Iron Low-ionization Outflow in the Early Evolution of the Nearby Tidal Disruption Event AT2019qiz*
- Jones, D.O., et al. inc. **Mockler, B.**, 2021, [ApJ](#), **908**, 143  
*The Young Supernova Experiment: Survey Goals, Overview, and Operations*
- Mockler, B.** & Ramirez-Ruiz, E., 2021, [ApJ](#), **906**, 101  
*An Energy Inventory of Tidal Disruption Events*
- Roth, N., et al. inc. **Mockler, B.**, 2020, [Space Sci. Rev.](#), **216**, 114  
*Radiative Emission Mechanisms of Tidal Disruption Events*
- Law-Smith, J. A. P., et al. inc. **Mockler, B.**, 2020, [ApJ](#), **905**, 141  
*Stellar TDEs with Abundances and Realistic Structures (STARS): Library of Fallback Rates*
- Hung, T., et al. inc. **Mockler, B.**, 2020, [ApJ](#), **903**, 31  
*Double-peaked Balmer Emission Indicating Prompt Accretion Disk Formation in an X-Ray Faint Tidal Disruption Event*
- Holoien, T.W.-S., et al. inc. **Mockler, B.**, 2020, [ApJ](#), **898**, 161  
*The Rise and Fall of ASASSN-18pg: Following a TDE from Early To Late Times*
- Leloudas, G., et al. inc. **Mockler, B.**, 2019, [ApJ](#), **887**, 218  
*The spectral evolution of AT 2018dyb and the presence of metal lines in tidal disruption events*
- Mockler, B.**, Guillochon, J., & Ramirez-Ruiz, E., 2019, [ApJ](#), **872**, 151  
*Weighing Black Holes with Tidal Disruption Events*
- Ascenzi, S., et al. inc. **Mockler, B.**, 2019, [MNRAS](#), **486**, 672  
*A luminosity distribution for kilonovae based on short gamma-ray burst afterglows*
- Perley, D., et al. inc. **Mockler, B.**, 2019, [MNRAS](#), **484**, 1031  
*The fast, luminous ultraviolet transient AT2018cow: extreme supernova, or disruption of a star by an*

*intermediate-mass black hole?*

Guillochon, J., et al. inc. **Mockler, B.**, 2018, [ApJS](#), 236, 6

*MOSFiT: Modular Open-Source Fitter for Transients*

Gallardo., P. A. et al. inc. **Mockler, B.**, 2017, [Appl. Opt.](#) 56, 2796

*Deep reactive ion etched anti-reflection coatings for sub-millimeter silicon optics*