

## EDUCATION

**University of Colorado, Boulder**

Ph.D., Astrophysics

expected 2026

M.S., Astrophysics (3.95 GPA)

2021 - 2023

**University of Michigan, Ann Arbor**

B.S., Physics; and Highest Honors in Astronomy &amp; Astrophysics

2016 - 2020

## PEER-REVIEWED PUBLICATIONS (90+ citations listed in ADS)

7. **J. Dorigo Jones**, B. Reyes, et al. *The Wrath of KAN: Learnable Activation Functions Improve Speed and Accuracy in Emulating the Cosmological 21 cm Signal*. In prep. for submission to ApJ.
6. J. J. Hibbard, et al. incl. **J. Dorigo Jones**. *Results from NASA's First Radio Telescope on the Moon: Terrestrial Technosignatures and the Low-Frequency Galactic Background Observed by ROLSES-1 Onboard the Odysseus Lander*. Submitted to ApJ
5. **J. Dorigo Jones**, S. Bahauddin, D. Rapetti, J. Mirocha, & J. Burns, 2024. *21cmLSTM: A Fast Memory-based Emulator of the Global 21 cm Signal with Unprecedented Accuracy*. ApJ, 977, 19
4. **J. Dorigo Jones**, D. Rapetti, J. Mirocha, J. J. Hibbard, J. Burns, & N. Bassett, 2023. *Validating Posteriors Obtained by an Emulator when Jointly Fitting Mock Data of the Global 21 cm Signal and High-z Galaxy UV Luminosity Function*. ApJ, 959, 49
3. **J. Dorigo Jones**, S. D. Johnson, Sowgat Muzahid, J. Charlton, H.-W. Chen, A. Narayanan, Sameer, J. Schaye, & N. A. Wijers, 2022. *Improving blazar redshift constraints with the edge of the Ly $\alpha$  forest: 1ES 1553+113 and implications for observations of the WHIM*. MNRAS, 509, 4330
2. **J. Dorigo Jones**, M. S. Oey, K. Paggeot, N. Castro, & M. Moe, 2020. *Runaway OB Stars in the Small Magellanic Cloud: Dynamical versus Supernova Ejections*. ApJ, 903, 43
1. M. S. Oey, **J. Dorigo Jones**, N. Castro, P. Zivick, G. Besla, et al., 2018. *Resolved Kinematics of Runaway and Field OB Stars in the Small Magellanic Cloud*. ApJ Letters, 867, L8

## AWARDS AND ACHIEVEMENTS

Astrophysics Graduate Fellowship (\$3,000), CU Boulder APS Department	2024
Chambliss Astronomy Achievement Graduate Student Award, AAS 241	2023
Astronomy Research Award for Best Senior Thesis, U-M Department of Astronomy	2020
Nominated for College of LS&A Prize for Excellence in Upper-Level Writing in Science	2019

## RESEARCH EXPERIENCE

**Research Assistant, Prof. Jack Burns and Dr. David Rapetti** 2022 - Present*Astrophysical and Planetary Sciences Department / CASA, University of Colorado, Boulder*

- Created a novel, publicly-available neural network emulator of the global 21 cm signal that uniquely leverages the signal's intrinsic temporal correlation to achieve unprecedented accuracy
- Performed complex Bayesian parameter estimation fitting global 21 cm signal mock data. Showed that even very accurate emulators can produce biased physical parameter constraints, and that jointly fitting complementary data sets is needed to constrain certain parameters
- Developed software to study radio emission in dynamic spectra from space-based instruments

**Research Assistant, Asst. Prof. Sean D. Johnson** 2020 - 2021*Department of Astronomy, University of Michigan*

- Reduced and analyzed *HST* COS NUV spectra of the blazar 1ES 1553+113 to clarify the nature of highly-ionized absorption lines detected toward it in the X-ray. Developed a robust technique to accurately constrain the redshift of any low-redshift AGN or blazar by characterizing the edge of the H I Ly $\alpha$  forest seen in the UV spectra of 192 AGN.

**Research Assistant, Prof. Sally Oey** 2017 - 2020*Department of Astronomy, University of Michigan*

- Analyzed *Gaia* proper motions,  $v \sin i$ , and masses of 300+ OB stars in the SMC to place novel constraints on stellar ejection mechanisms: Most runaways are dynamically ejected, 2-step ejections are significant, and Oe/Be stars likely originate as post-mass-transfer binaries.

## INVITED TALKS/SEMINARS

1. Los Alamos National Lab, Center for Space and Earth Science. Host: G. Salvesen. 11/2024.

## TEACHING, DEPARTMENT SERVICE, AND OUTREACH

- Graduate Student Representative, Admissions Committee** 2024 - 2025  
*Department of Astrophysical and Planetary Sciences, University of Colorado, Boulder*  
Performed triage to select the 84 best PhD applicants out of 530 total applications
- Teaching Assistant (two semesters)** 2021 - 2022  
*Department of Astrophysical and Planetary Sciences, University of Colorado, Boulder*  
Only TA for 300-level Astrophysics I (76 students). Taught 3 weekly recitation sections and developed and graded homeworks, labs, and exams  
TA for Intro to Astronomy (62 students). Taught 2 weekly labs, led observing labs, and graded
- Graduate Student Representative, Colloquium Committee** 2021 - 2022  
*Department of Astrophysical and Planetary Sciences, University of Colorado, Boulder*  
Organized and promoted weekly discussions between colloquia speakers and graduate students
- Undergraduate Representative, Curriculum Committee** 2018 - 2020  
*Department of Astronomy, University of Michigan*  
Provided input on topics regarding undergraduate coursework and programs
- Treasurer, Student Astronomical Society** 2018 - 2020  
*University of Michigan*  
Developed budgets, tracked expenses, led outreach activities, and designed club apparel

## CONFERENCE PRESENTATIONS AND PROCEEDINGS

11. **J. Dorigo Jones**, J. O. Burns, D. Rapetti, & S. M. Bahauddin. *Extracting Early Universe Physics From the First Lunar-based Observations of the 21 cm Signal with a Novel Memory-based Emulator*. IAUS 397: UniversAI: Exploring the Universe with Artificial Intelligence. Oral Talk. 06/2025.
10. M. S. Oey, et al. incl. **J. Dorigo Jones**. *Kinematics of Massive, Emission-Line Stars in the LMC and SMC*. Hot Stars: Life with Circumstellar Matter. 10/2024.
9. J. O. Burns, et al. incl. **J. Dorigo Jones**. *The Dawn of Radio Astronomy from the Moon: ROLSES on Intuitive Machines' Odysseus Lander*. Press Conf./Talk, AAS Meeting #244, 210.01. 06/2024.
8. S. D. Bale, et al. incl. **J. Dorigo Jones**. *LuSEE 'Night': The Lunar Surface Electromagnetics Experiment*. URSI GASS 2023. 08/2023. (20+ citations in ADS)
7. **J. Dorigo Jones**, D. Rapetti, N. Bassett, J. J. Hibbard, et al. *Validating and Improving Bayesian Parameter Estimation for Global 21-cm Cosmology*. Poster, AAS Meeting #242, 101.04. 06/2023.
6. **J. Dorigo Jones**, N. Bassett, D. Rapetti, J. J. Hibbard, J. Mirocha, J. O. Burns. *Radio Astrophysics from the Moon: Utilizing a Global 21-cm Signal Emulator to More Efficiently Conduct Bayesian Parameter Estimation*. Poster (**Chambliss Award**), AAS Meeting #241, 104.26. 01/2023.
5. **J. Dorigo Jones**, N. Bassett, D. Rapetti, J. J. Hibbard, J. Mirocha, & J. O. Burns. *Utilizing Global 21-cm Signal Emulators to Forecast Constraints on Astrophysical Parameters with ARES*. Poster, 5th Global 21-cm Workshop. 10/2022.
4. M. S. Oey, **J. Dorigo Jones**, et al. *Dynamical vs Supernova Acceleration of OB Stars in the Small Magellanic Cloud*. IAU Symposium No. 361 Proceedings: Massive Stars Near & Far. 05/2022.
3. **J. Dorigo Jones**, S. D. Johnson, S. Muzahid, et al. *Constraining the Redshift of Featureless Blazar 1ES 1553+113 and Implications for the WHIM*. Poster, AAS Meeting #238, 116.02. 06/2021.
2. **J. Dorigo Jones**, Pagneot, Oey, et al. *Runaway OB Stars in the Small Magellanic Cloud: Dynamical Ejections Dominate over Supernova Ejections*. Poster, AAS Meeting #235, 110.18. 01/2020.
1. **J. Dorigo Jones**, M. S. Oey, et al. *Fast and Furious: Constraints on Runaway Ejection Mechanisms for Massive Stars in the Small Magellanic Cloud*. Poster, AAS Meeting #233, 155.08. 01/2019.

## NON-PEER-REVIEWED PUBLICATIONS

1. B. D. Oppenheimer, D. Nagai, E. Lau, P. Singh, A. Butler, N. Gluck, **J. Dorigo Jones**, I. Medlock, & F. Villaescusa-Navarro. 2022, A Multi-Wavelength, Multi-Model Exploration of How Feedback Disrupts Gaseous Atmospheres, *Galactic Atmospheres*, <https://galacticatmospheres.pubpub.org/pub/zrdhtddz>