

ZOIE TELKAMP

Department of Astronomy, PO Box 400325, 530 McCormick Road, Charlottesville, VA 22904
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Education

University of Virginia

PhD in Astronomy

Master of Science in Astronomy, GPA: 4.0/4.0

Advisor: Dr. Adele Plunkett

Anticipated Defense Date: April 2027
2023

University of California, Berkeley

Bachelor of Arts in Astrophysics

2020

Research Experience

Graduate Student Researcher

2021–Present

University of Virginia, Department of Astronomy

Investigating star formation from low to high masses using observations from ALMA, JWST, Herschel, Spitzer, and SOFIA. Co-developed open-source analysis tools including the *sedcreator* Python package to enable community science (15+ publications).

Junior Astronomy Specialist

2020–2021

University of California, Berkeley

Led development of an autoencoder neural network to generate synthetic protoplanetary disk images 1000× faster than traditional radiative transfer calculations, enabling efficient disk modeling. Published first-authored paper in *The Astrophysical Journal*.

Undergraduate Astronomy Researcher

2019–2020

University of California, Berkeley

Used methods including principal component analysis to investigate relationships between protoplanetary disk physical properties and morphology. Co-authored two publications and participated in observing runs at Keck and Lick observatories.

Teaching Experience

Graduate Student Teaching Assistant

University of Virginia, Department of Astronomy

Astronomy 4470/5470: Computational Astrophysics (Graduate-level)

Spring 2026

Astronomy 1220: Stars, Galaxies, and the Universe

Spring 2026

Astronomy 1210: Intro Sky and Solar System

Spring 2024

Astronomy 1280: Origins of Almost Everything

Spring 2024

Astronomy 5110: Astronomical Techniques (Graduate-level)

Fall 2023

Astronomy 1220: Stars, Galaxies, and the Universe

Fall 2023

Astronomy 2110: Introduction to Astrophysics

Fall 2022

Astronomy 1290: Black Holes

Fall 2022

Summer Student Supervisor

Summer 2022

Chalmers/Virginia Initiative on Cosmic Origins (CICO/VICO)

Co-supervisor to Sam Crowe, “Massive Protostars in the Galactic Center” and Alejandro Romar Tejeiro, “Infrared Light in the Dark (I-LID)—A Census of Star Formation in IRDCs”.

Undergraduate Course Grader

Fall 2019

University of California, Berkeley

Astronomy 160: Stellar Astrophysics

Awards and Honors

Jefferson Scholars Foundation Dissertation Year Fellowship

2026-2027

*Awarded by the Jefferson Scholars Foundation.***Emma Williams Prize in Astronomy**

2025

Awarded by the University of Virginia Astronomy Department for outstanding research achievement by a fourth-year graduate student.

American Astronomical Society (AAS) Nova, “Selections from 2025”

2025

Telkamp et al. (2025) featured on Nova as one of the most-read journal articles published that year.
<https://aasnova.org/2025/12/22/selections-from-2025-the-formation-of-massive-stars/>

Virginia Space Grant Consortium (VSGC) Graduate STEM Research Fellowship Program

2023–2025

*Awarded by the VSGC to help support a research project supporting NASA’s mission.***International Astronomical Union Grant**

2023

*Awarded by the IAU to attend Kavli-IAU S383.***Dorothea Klumpke Roberts Prize in Astronomy**

2020

Awarded by the UC Berkeley Astronomy Department for outstanding scholarly achievement by either an upper-level undergraduate student, or an outstanding graduate student early in his/her research career.

Undergraduate Research Apprentice Program (URAP) Summer Award

2020

Awarded to select students nominated by their project mentor to support their summer research.

Publications

First Author

Telkamp, Z., Plunkett, A., Tan, J.C., 2026, “An Archival ALMA Survey of Disks around Massive Protostars,” submitted to ApJ; revisions in progress

Telkamp, Z., Fedriani, R., Tan, J. C., Law, C., Yang, Y., Plunkett, A., et al., 2025, “The SOFIA Massive (SOMA) Star Formation Survey. V. Clustered Protostars,” ApJ, 986, 15

Telkamp, Z., Martínez-Palomera, J., Duchêne, G., Ashimbekova, A., Wolfe, E., Angelo, I., Pinte, C., 2022, “A machine learning framework to predict images of edge-on protoplanetary disks,” ApJ,

Contributing Author

Fedriani, R., Tan, J. C., **Telkamp, Z.** (+13 co-authors), 2023, “The SOFIA Massive (SOMA) Star Formation Survey. IV. Isolated Protostars,” *ApJ*, 942, 53

Jørgensen, J., Coutens, A., Drozdovskaya, M., Lee, J.-E., Plunkett, A., Maret, S., Belloche, A., Harsono, D., **Telkamp, Z.** (+20 coauthors), 2026, “Complex Organic Molecules in Protostars with ALMA Spectral Surveys (COMPASS). I. Overview of the ALMA Large Program,” submitted to *A&A*

Plunkett, A. (+26 coauthors and **Telkamp, Z.**), 2026, “Complex Organic Molecules in Protostars with ALMA Spectral Surveys (COMPASS). II. Approach to data reduction and products for line-rich broadband (sub-)millimeter spectra,” submitted to *A&A*

Coutens, A. (+26 coauthors and **Telkamp, Z.**), 2026, “Complex Organic Molecules in Protostars with ALMA Spectral Surveys (COMPASS). III. CH₃OH isotopic fractionation in the low-mass protostar BHR71-IRS1,” submitted to *A&A*

Gigli, D., Gorai, P., Law, C. Y., Tan, J. C., Bonfand, M., Rahman, T., Zhang, Y., Taniguchi, K., Fedriani, R., **Telkamp, Z.** (+2 co-authors), 2025, “The SOMA MM Survey. I. An Astrochemical Census of Massive Protostars,” *A&A*, in press

Oakey, P., Yang, Y. L., Tan, J. C., Bisbas, T., Fedriani, R., Tanaka, K., **Telkamp, Z.** (+3 co-authors), 2025, “The SOMA Atomic Outflow Survey. I. An Atomic OI and Highly Ionized OIII Outflow from Massive Protostar G11.94-00.62,” *A&A*, in press

Crowe, S., Fedriani, R., Tan, J. C., Whittle, M., Zhang, Y., Caratti o Garatti, A., Farias, J. P., Gautam, A., **Telkamp, Z.** (+24 co-authors), 2024, “Near-infrared observations of outflows and young stellar objects in the massive star-forming region AFGL 5180,” *A&A*, 682, 27

Finn, M., Mazzei, R., Drechsler, B., **Telkamp, Z.**, Rao, M., Agrawal, P., McAlister, A., 2023, “How Informal Science Education Influences Elementary Students’ Perceptions of Science and Themselves,” *Journal of STEM Outreach*, 6, 1

Angelo, I., Duchêne, G., Stapelfeldt, K., **Telkamp, Z.** (+8 coauthors), 2023, “Demographics of Protoplanetary Disks: A Simulated Population of Edge-on Systems,” *ApJ*, 945, 130

Villenave, M., Ménard, F., Dent, W., Duchene, G., Stapelfeldt, K., Benisty, M., Boehler, Y., Plas, G., Pinte, C., **Telkamp, Z.** (+8 co-authors), 2020, “Observations of edge-on protoplanetary disks with ALMA. I. Results from continuum data,” *A&A*. 642, 164

Talks

“Benchmarking LLM Use in Multiwavelength Astronomy” <i>NSF-Simons AI Institute for Cosmic Origins Webinar</i>	2026
“An Archival ALMA Survey of Disks Around Massive Protostars” <i>Chalmers/Virginia Initiative on Cosmic Origins (CICO/VICO) Spring Workshop, University of Virginia</i>	2026
“A Multi-Scale Comparison of Star Formation from Low to High Masses” <i>Astronomy Seminar, Virginia Tech (Invited)</i>	2026

“Investigating Massive Star Formation with the Atacama Large Millimeter/ submillimeter Array (ALMA)” <i>Virginia Space Grant Consortium Graduate Research Conference, Hampton University</i>	2025
“The SOFIA Massive (SOMA) Star Formation Survey: Clustered Regions” <i>Bob Rood Symposium, University of Virginia</i>	2025
“Probing Massive Star Formation with the ALMA Archive” <i>Bob Rood Symposium, University of Virginia</i>	2024
“Zooming into Massive Star Formation: A Multi-scale Approach” <i>“TUNA” Lunch Talks, National Radio Astronomy Observatory (NRAO)</i>	2023
“The SOMA Survey - Probing Massive Star Formation Across Galactic Environments” <i>Our Galactic Ecosystem: Opportunities and Diagnostics in the Infrared and Beyond, University of California, Los Angeles, Lake Arrowhead Lodge</i>	2022
“The SOFIA Massive (SOMA) Star Formation Survey: New Algorithms and New Environments” <i>Virginia Initiative on Cosmic Origins, University of Virginia</i>	2021
“Developing a Physics-Aware Neural Network to Generate Edge-On Protoplanetary Disk Images” <i>237th Meeting of the American Astronomical Society, Virtual format</i>	2021

Posters

“Benchmarking LLM Use in Multiwavelength Astronomy” <i>2nd Annual NSF-Simons AI Institute for Cosmic Origins Science Conference, Charlottesville, Virginia</i>	2026
“Probing Massive Star Formation with the ALMA Archive” <i>ALMA at 10 years: Past, Present, and Future, Virtual format</i>	2023
“The SOMA Survey - Probing Massive Star Formation Across Galactic Environments” <i>From Stars to Galaxies II, Chalmers University of Technology</i>	2022
“Characterizing the Radial and Vertical Structure of Protoplanetary Disks” <i>Summer Intern Poster Symposium, University of California, Berkeley</i>	2019

Leadership and Outreach

Sedcreator Python package <i>Co-lead developer</i>	2021–Present
Graduate School of Arts and Sciences Council <i>Representative for the UVA Astronomy Department</i>	2023–2024
Dark Skies, Bright Kids (DSBK) Assessments <i>Researcher and co-author of a publication in the Journal of Stem Outreach investigating the enrichment of science education in under-served school systems</i>	2021–2023

Additional Skills

Technical: Python, Docker, UNIX, HTML, JavaScript, LaTeX, GitHub, Google Colab, SAOImageDS9, MCFOST

AI/Machine Learning: Large Language Models (LLMs), Deep Neural Networks, Principal Component Analysis (PCA), Random Forest Regression, Multivariate Linear Regression, Polynomial Regression