Theo O'Neill

theo-oneill.github.io
theo.oneill@cfa.harvard.edu

Education

Harvard University 2023 – Present
  – Ph.D., Astronomy & Astrophysics

University of Virginia
  – B.S. Astronomy-Physics (with high distinction) & Statistics 2022
  – *Thesis:* Star Formation and Feedback in Low-metallicity Environments: From Molecular Clouds to Protostars

Experience

Graduate Researcher, Center for Astrophysics | Harvard & Smithsonian 2023 –
Advisors: Dr. Catherine Zucker & Prof. Doug Finkbeiner

Undergraduate Researcher, University of Virginia 2019 – 2022
Advisor: Prof. Rémy Indebetouw

NSF REU, Smithsonian Astrophysical Observatory 2022
Advisor: Prof. Alyssa Goodman

Undergraduate Research Fellow, Chalmers Initiative on Cosmic Origins 2020 – 2021
Advisors: Prof. Jonathan Tan & Dr. Giuliana Cosentino

Awards

NSF Graduate Research Fellowship 2023
Goldwater Scholarship 2022
Astronaut Scholarship 2022
Universities Space Research Association Distinguished Undergraduate Award 2022
D. Nelson Limber Award, UVA Dept. of Astronomy (*Outstanding 4th year undergraduate*) 2023
Vyssotsky Prize, UVA Dept. of Astronomy (*Outstanding 3rd year undergraduate*) 2022
McCullough Scholarship, UVA Dept. of Astronomy (*Outstanding 2nd year undergraduate*) 2021
Echols Scholar & College Science Scholar, UVA 2018

Observing Time

PI: JWST Cycle 4 Archival Program, " Topological Mapping of Superbubbles and ISM Structures with JWST."
PI: ALMA Cycle 9, "CO-dark gas in the Low-metallicity Star-forming region NGC 602." 11 hrs.
Co-I: JWST Cycle 3 (PI: E. Sabbi).
Co-I: ALMA Cycle 10 (PI: E. Koch).
Co-I: ALMA Cycle 10 (PI: S. Madden).

Publications

8. Gao, B. A.; Zucker, C.; Sridharan, T. K.; Swiggum, C.; Bialy, S.; O'Neill, T. J.; Peek, J. E. G.; et al. *Origin of the IRAS Vela Shell: New Insights from 3D Dust Mapping.* 2025, arXiv:2504.12381, accepted by ApJ.

7. O'Neill, T. J.; Goodman, A. A.; Soler, J. D.; Zucker, C.; Han, J. J. *A 3D Model of the Local Bubble's Magnetic Field: Insights from Dust and Starlight Polarization.* 2024, arXiv:2410.17341, accepted by ApJ.

6. O'Neill, T. J.; Zucker, C.; Goodman, A. A.; Edenhofer, G. *The Local Bubble is a Local Chimney: A New Model from 3D Dust Mapping.* 2024, ApJ, 973, 136.

5. Hsu, C.; Tan, J. C.; Christie, D.; Cheng, Y.; O'Neill, T. J. *GMC Collisions As Triggers of Star Formation. VIII. The Core Mass Function.* 2023, MNRAS, 552, 700.

4. O'Neill, T. J.; Indebetouw, R.; Sandstrom, K. M.; Bolatto, A. D.; Jameson, K. E.; Carlson, L. R.; Finn, M. K.; Meixner, M.; Sabbi, E; Sewilo, M. *Sequential Star Formation in the Young SMC Region NGC 602: Insights from ALMA.* 2022, ApJ, 938, 82.

3. O'Neill, T. J.; Indebetouw, R.; Bolatto, A. D; Madden, S. C; Wong, T. *Effects of CO-dark Gas on Measurements of Molecular Cloud Stability and the Size-Linewidth Relationship.* 2022, ApJ, 933, 179.

2. Swift, J. J; and forty other authors including O'Neill, T. J. *The Renovated Thacher Observatory and First Science Results.* 2022, PASP, 134, 1033.

1. O'Neill, T. J.; Cosentino, G.; Tan, J. C.; Cheng, Y.; Liu, M. *The Core Mass Function across Galactic Environments. III. Massive Protoclusters.* 2021, ApJ, 916, 45.

Non-refereed:

2. Rasmusssen, K.; Chen, J.; Colquhoun, R. L.; Frentz, S.; Hiatt, L.; Kosciesza, A. J.; Olsen, C.; O'Neill, T. J.; Zamloot, V.; Strauss, B. E. *Gender Inclusive Methods in Studies of STEM Practitioners.* 2023, arXiv:2307.15802.

1. Strauss, B. E.; Borges, S. R.; Faridani, T.; Grier, J. A.; Kiihne, A.; Maier, E. R.; Olsen, C.; O'Neill, T.; Rivera-Valentín, E. G.; Sneed, E. L.; Waller, D.; Zamloot, V. *Nonbinary Systems: Looking Towards the Future of Gender Equity in Planetary Science.* 2020, State of the Profession White Paper for the Planetary Science and Astrobiology Decadal Survey 2023–2032.

PRESENTATIONS

Talks:

Inter+Stellar: Harnessing the Intersection Between Stars and the ISM; STScI, Baltimore, MD. *High-Altitude Clouds in the Solar Neighborhood: Connecting 3D Dust Maps and HI Gas Kinematics*	2025
Harvard-Heidelberg Star Formation Workshop; Heidelberg, Germany. *Mapping Superbubbles across Galactic & Extragalactic Environments*	2024
Multiphase Madness: Resolving the CGM in Theory and Observations; Cambridge, MA. *The Topology of the Local Disk-Halo Interface*	2024
New Computational Methods in Milky Way Dynamics and Structure; Ringberg Castle, Germany. *Mapping Galactic Bubbles, Shells, and Clouds with Persistent Homology*	2024
Northeast Star & Planet Formation Meeting; MIT Haystack Observatory. *Mapping Galactic Bubbles, Shells, and Clouds with Persistent Homology*	2024
244th Meeting of the AAS; Madison, WI. *Mapping Galactic Bubbles, Shells, and Clouds with Persistent Homology*	2024
Fields, Flows, & Filaments in the Magnetic ISM; Stanford KIPAC. *A 3D Map of the Local Bubble's Magnetic Field: Insights from Dust & Starlight Polarization*	2024
Surveying the Milky Way: the Universe in Our Own Backyard; Caltech IPAC. *The 3D Structure of Bubbles & Clouds in the Solar Neighborhood, identified with Persistent Homology*	2023

Harvard-Heidelberg Star Formation Workshop; Cambridge, MA. 2023
The 3D Structure of Bubbles & Clouds in the Solar Neighborhood, identified with Persistent Homology

Colloquium, UVA Physics Department; Charlottesville, VA. 2023
Mapping the Local Bubble's Magnetic Field in 3D

Press Conference at 241st Meeting of the AAS; Seattle, WA. 2023
A 3D Map of the Local Bubble's Magnetic Field

241st Meeting of the AAS; Seattle, WA. 2023
A 3D Map of the Local Bubble's Magnetic Field

Max Planck Institute for Extraterrestrial Physics CAS Star & Planet Formation Journal Club; remote. 2022
Sequential Star Formation in the Young SMC Region NGC 602

Michigan State University Astro Coffee; remote. 2021
The Core Mass Function Across Galactic Environments

237th Meeting of the AAS; remote. 2021
The Core Mass Function in Massive, Dense Protoclusters

VICO-CICO Fall Science Workshop; remote. 2020
The Core Mass Function in Massive Protoclusters

Posters:

229th meeting of the AAS; Grapevine, TX. 2017
First Light of the Renovated Thacher Observatory

227th meeting of the AAS; Kissimmee, FL. 2016
The Renovation and Future Capabilities of the Thacher Observatory

Public Talks:

Gloucester Area Astronomy Club; Gloucester, MA. 2024
The Local Bubble & Beyond: Mapping the Bubbly Milky Way in 3D

Thacher High School; Ojai, CA. 2023
Mapping the Bubbly 3D Milky Way

ADVISING

Abigail Bohl: Smithsonian Astrophysical Observatory REU Student 2024 –

SERVICE

Volunteer, Harvard Open Observatory Nights 2024 –
Mentor, Harvard Physics Polaris Mentoring Program 2023 –
Organizing Committee, Harvard-Heidelberg Star Formation Workshop 2023, 2024
Organizing Committee, Multiphase Madness: Resolving the CGM in Theory and Observations 2024
Diversity, Equity, and Inclusion Committee, UVA Dept. of Astronomy 2021 – 2022
Graduate-Undergraduate Astronomy Committee, UVA Dept. of Astronomy 2020 – 2022
Mentor, UVA Astronomy Undergraduate Peer Mentoring Program 2020 – 2022

June 2025