


# Elias K. Oakes

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## Education

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| <b>The University of Connecticut</b> Storrs, CT<br><b>Ph.D.</b> Physics<br>Advisor: Christopher M. Faesi   | August 2021 - Present      |
| <b>The University of Chicago</b> Chicago, IL<br><b>B.S.</b> Astrophysics with Honors; <b>B.A.</b> Physics<br>Honors thesis: <i>The Distance to the Fornax dSph via the Tip of the Red Giant Branch and Horizontal Branch Stars</i><br>Advisor: Wendy L. Freedman | September 2016 - June 2020 |

## Awards and Honors

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| <b>NASA Connecticut Space Grant Consortium</b><br>\$8,000 over three months   | June - August 2022 |
| <b>Chambliss Astronomy Achievement Award</b><br>Honorable mention             | January 2021       |
| <b>National Merit Scholar</b><br>\$16,000 over four years                     | 2016 - 2020        |
| <b>Dean's Fund for Undergraduate Research</b><br>One-time grant of \$1,346.42 | December 2019      |
| <b>University of Chicago Dean's List</b>                                      | 2016 - 2018        |

## Professional Experience

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| <b>Graduate Research Assistant</b><br><i>University of Connecticut, Storrs, CT</i><br>Investigating the hierarchical structure and scales of molecular gas in nearby galaxies using wide-field, high-resolution ALMA CO data cubes as part of the PHANGS collaboration.                       | August 2021 - Present        |
| <b>Charge Injection Systems Expert</b><br><i>CERN, Meyrin, Switzerland</i><br>Upgraded, calibrated, and maintained the Hadronic Tile Calorimeter on the ATLAS experiment at the Large Hadron Collider, with a focus on the charge injection and cooling systems.                              | June 2020 - July 2021        |
| <b>Undergraduate Research Assistant</b><br><i>Kavli Institute for Cosmological Physics, Chicago, IL</i><br>Measured three new distances to the Fornax dwarf spheroidal galaxy, working with Prof. Wendy Freedman in the Carnegie-Chicago Hubble Program.                                      | September 2017 - August 2021 |
| <b>Research Intern</b><br><i>REU Program at the Max Planck Institute for Astronomy, Heidelberg, Germany</i><br>Developed methods to associate giant molecular clouds and HII regions in overlapping ALMA and VLT/MUSE data, working with Prof. Christopher Faesi in the PHANGS collaboration. | June - September 2019        |

## Publications

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“The impact of HII regions on Giant Molecular Cloud properties in nearby galaxies sampled by PHANGS ALMA and MUSE.” Zakardjian, A., Pety, J., Herrera, C. N., Hughes, A., **Oakes, Elias K.**, and the PHANGS collaboration, accepted in *A&A*.

“Distances to Local Group Galaxies via Population II, Stellar Distance Indicators II: The Fornax Dwarf Spheroidal.” **Oakes, Elias K.**, Hoyt, T. J., Freedman, W. L., Madore, B. F., Tran, Q. H., Cerny, W., Beaton, R. L., and Seibert, M. 2022, *ApJ*, **786**, 64.

“Distances to Local Group Galaxies via Population II, Stellar Distance Indicators I: The Sculptor Dwarf Spheroidal.” Tran, Q. H., Hoyt, T. J., Freedman, W. L., Madore, B. F., **Oakes, Elias K.**, Cerny, W., Hatt, D., and Beaton, R. L. 2022, *ApJ*, **935**, 34.

“Multi-Wavelength, Optical (VI) and Near-Infrared (JHK) Calibration of the Tip of the Red Giant Branch Method based on Milky Way Globular Clusters.” Cerny, W., Freedman, W. L., Madore, B. F., Ashmead, F., Hoyt, T., **Oakes, Elias K.**, Tran, Q. H., and Moss, B. 2020, arxiv:astro-ph/0507244.

## Scientific Presentations

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“Are GMCs Real? Measuring the virial parameter at high resolution in NGC 253.” Talk presented at Northeast Star and Planet Formation meeting, June 28, 2023, Cambridge, MA.

“Environmental dependence of star formation efficiency in spiral galaxy NGC 4254.” Poster presented by Neal Krishna at AAS 241, January 8-12, 2023, Seattle, WA.

“Are GMCs Real? Measuring the virial parameter at high resolution in NGC 253.” Poster presented at NASA CTSG Exposition, November 4, 2022, Windsor Locks, CT.

“Are Giant Molecular Clouds (GMCs) Real? Measuring the virial parameter at high resolution in NGC 253.” Poster presented at From Stars to Galaxies II, June 20-24, 2022, Gothenburg, Sweden.

“Three Population II Distances to the Fornax Dwarf Spheroidal.” Talk presented at UConn Physics Colloquium, March 30, 2022, Storrs, CT.

“The distance to the Fornax dSph via the tip of the red giant branch and horizontal branch stars.” Poster presented at AAS 237, January 11-15, 2021 (remote due to COVID-19).

“The Cradles of Giants: Star formation at high resolution in nearby galaxies.” Poster presented at AAS 235, January 4-8, 2020, Honolulu, HI.

“Observations and association of GMCs and HII regions in the PHANGS sample.” Talk presented at MPA Galaxy Talks, August 29, 2019, Heidelberg, Germany.

“Aggregation as an efficiency driver in bulk heterojunction devices measured through mixed squaraines in ternary blends.” Poster at SPIE Optics + Photonics, August 19-23, 2018, San Diego, CA.

“The role of H-aggregation on device efficiency as determined through squaraine sidegroup elongation and molecular separation in crystals.” Poster presented at SPIE Optics + Photonics, August 19-23, 2018, San Diego, CA.

## Service, Teaching, and Outreach

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**Graduate Student Lead** July 2022 - Present  
*UConn Science, Technology, and Astronomy Recruits (STARs)*

Mentor a cohort of 18 undergraduates from historically excluded backgrounds in physics to organize public outreach to local schools.

**Undergraduate Thesis Mentor** August 2022 - July 2023  
*Group of Prof. Christopher Faesi*

Mentored Neal Krishna in his honors thesis project on the star formation scaling relation.

**Union Guide** July 2023 - Present

**District Steward** September 2022 - July 2023

*Graduate Employee & Postdoc Union - United Auto Workers Local 6950*

Lead outreach to local members, organize events and political actions, and address grievances.

**Lead Member** May 2022 - Present

*PHANGS Colloquium and YouTube teams*

Facilitate colloquium events and an external video series about PHANGS research.

**Lead Member** August 2022 - Present

*UConn Astrophysics Seminar Committee*

Invite speakers and organize weekly seminars for UConn Astrophysics community.

**Volunteer Scientist** July 2022 - Present

*Skype a Scientist*

Regularly discuss astrophysics via accessible, educational presentations to schools and groups.

**Organizing Member** August 2021 - Present

*UConn Physics Graduate Student Association*

Help organize the first Astronomy on Tap events in Connecticut.

**Teaching Assistant** August 2021 - June 2022

*UConn Physics Department*

Led two sections each of lab-based introductory physics classes: PHYS 1401Q and PHYS 1502Q.

**Organizing Member** September 2017 - June 2020

*UChicago Society for Physics Students*

Ran events including the 2020 Conference for Undergraduate Women in Physics (CUWiP).

## Observing Experience and Technical Skills

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**National Radio Astronomy Observatory (NRAO)** June 13 - 21, 2023

Participant in the 19<sup>th</sup> NRAO Synthesis Imaging Workshop.

**IRAM 30-meter telescope** February 3 - 6, 2023

Awarded and executed 18.5 hours for resolved CO observations of giant molecular clouds in M31.

**Submillimeter Array (SMA)** January 18 - 22, 2022

Participant in the 2022 SMA Interferometry School, awarded and executed one hour of observations.

**Institut de Radioastronomie Millimétrique (IRAM)** November 15 - 23, 2021

Participant in the 10<sup>th</sup> IRAM 30-meter School on Millimetre Astronomy.

**Programming:** Proficient in Python, C, Linux systems, Java, HTML.

**Software:** Proficient with CASA, IRAF, SAOImage DS9, DAOPHOT/ALLSTAR, ROOT. Familiar with high-performance computing (Bridges-2, UConn TACC).