

# EMILY LUBAR

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## SUMMARY OF QUALIFICATIONS

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- Astrophysicist with 4 yrs experience in instrumentation; electronics, optics, Python
- Experience with designing, aligning, and troubleshooting UV and visible optical systems
- Experience with characterization and fabrication of silicon immersion gratings for astronomical applications via lithography/wet chemical etch processes
- Excellent leadership, communication and collaboration skills. Resourceful and creative problem solver with interdisciplinary background

## EDUCATION

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**Ph.D., The University of Texas at Austin** May 2021 - present  
Infrared Instrumentation and Brown Dwarf Evolutionary Science

**M.S., The University of Texas at Austin** December 2021  
Fabrication and Characterization of Silicon Dispersive Optics

**B.A./B.S., The Evergreen State College** received June 2017  
Dual Bachelor of Arts & Science Degrees (interdisciplinary)  
Emphasis in Physics and Applied Math

## RESEARCH EXPERIENCE

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**Graduate Research Assistant** August 2019 - present  
*The University of Texas at Austin, Department of Astronomy*

- Developing a prototype instrument concept that utilizes our Silicon immersion gratings to probe the composition of exoplanets and their host stars.
- Fabrication and Characterization of Silicon immersion gratings via lithography/wet chemical etch technique. Carrying out precise measurements of final fabricated grating blaze via theoretical and data-driven analysis.
- Collecting and analyzing Immersion Grating Infrared Spectrometer (IGRINS) data with Python to answer questions about the early evolution of brown dwarfs and young stellar objects.

**Research Technologist** Oct 2017 - August 2019  
*Penn State University, Department of Astronomy and Astrophysics*

- Developed and maintained the wiring and electronics in the Environmental Control System for the HPF (Habitable-zone Planet Finder) and NEID (Tohono O'odham word meaning "to see/discover") spectrographs
- Tested and characterized the fiber feed systems for the HPF and NEID spectrographs
- Developed and updated documentation

## REU (Research Experience for Undergraduates) Participant

Summer 2016

*Arecibo Observatory, Puerto Rico*

- Collected data with the 305m Arecibo radio telescope. Analyzed said data with others (e.g. GALFA-HI and Effelsberg-Bonn surveys) to determine the dynamics, scale and structure of interstellar filaments.

## Physics and Calculus Tutor

Aug 2015 - June 2017

*The Evergreen State College, QuaSR tutoring center*

- Tutored students in Physics I, II, III, Calculus I, II, III, and select advanced physics topics
- Participated in pedagogy/leadership training to hone tutoring skills for better communication, problem solving, and guidance of students from all backgrounds

## LEADERSHIP

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### Department Equity & Inclusion discussion group leader

October 2020 - present

*The University of Texas at Austin, Department of Astronomy*

- Organizing, facilitating and curating topics for discussion group (and book club sub-component)

### Founder and co-leader of Penn State Department Women and Underrepresented Genders in Astronomy (W+iA)

Nov 2017 - August 2019

*Penn State University, Department of Astronomy & Astrophysics*

- Facilitated group meetings, co-lead/co-organized group events

### Founder and first President of Evergreen Astronomical Society

Nov 2017 - August 2019

*Evergreen State College*

- Planned and lead all club meetings
- Organized campus-wide star parties and other events
- Wrote EAS club budget to fund club events and equipment

## TECHNICAL SKILLS

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**Hardware:** General clean room procedures and optics handling, machine shop training, basics of electronics trouble shooting, soldering, and processing/handling/characterization of optical fibers & gratings.

**Software:** Python, Zemax/OpticStudio, LaTeX/Overleaf, GitHub, Arduino programming.

## SELECTED PUBLICATIONS (1/10)

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**E. Lubar**, et al., (2020) *Precise Blaze Angle Measurements of Lithographically Fabricated Silicon Immersion Gratings*. Proceedings of SPIE, Volume 11451, Advances in Optical and Mechanical Technologies for Telescopes and Instrumentation IV; 114515I. <https://doi.org/10.1117/12.2561128>

## AWARDS

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### NASA Group Achievement Award

October 2020

*Penn State University, Department of Astronomy & Astrophysics*

For the development and delivery of the state-of-the-art NEID radial velocity spectrograph and port adapter to the WIYN 3.5-meter telescope on Kitt Peak (Awarded to the whole NEID instrument team)