

Samuel M. Factor

POSTDOCTORAL RESEARCH FELLOW

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Summary and Highlighted Qualifications

Highly motivated and independent researcher seeking to transition into the aerospace industry. Aiming to leverage broad expertise in space-based observational techniques, novel image processing algorithms, statistical data analysis, physical modeling, and lab experience acquired through a Ph.D. in Astronomy. Learns quickly and can apply and communicate new knowledge efficiently and effectively.

- Programing languages & tools:
 - Fluent in: Python, bash (Linux/Unix), git
 - Familiar with: C, SQL, Fortran, slurm
- Space-based imaging (*HST*, *JWST*), data processing and analysis, high-contrast imaging
- Super-resolution imaging, Interferometric data processing (near-infrared & radio)
- Statistical analysis and optimization: hierarchical Bayesian modeling and inference (MCMC, nested sampling)
- Data visualization (python/matplotlib)
- Technical writing and oral communication
- Laboratory optics, electronics, basic CAD and machine shop experience

Research Experience

Postdoctoral Research Fellow, The University of Texas at Austin **2023 – Present**

- Assessing the strengths, weaknesses, and best practice observing strategies for *JWST* high-resolution kernel-phase imaging to maximize the yield of valuable telescope time.
- PI of a Cycle 1 *JWST* archival program which is funding this work (**\$145,090**)

Graduate Student Researcher, The University of Texas at Austin **2015 – 2023**

- Developed python-based software pipelines run on the Texas Advanced Computing Center (TACC).
- Studied the formation of companions to low mass stars using *Hubble Space Telescope* (*HST*) imaging.
- Applied a novel interferometric postprocessing technique to detect faint companions at previously inaccessible separations below the diffraction limit and assessed the detection limits of the technique.
- Modeled the demographics (frequency, orbit, mass ratio) of companions to study their formation mechanism. Found evidence that dynamical evolution sculpts young low-mass binary systems.
- PI of two *HST* archival programs which funded this work (**\$255,515**), two associated publications.

Undergraduate & Graduate Student Researcher, Wesleyan University **2012 – 2015**

- Modeled the structure of a planet-forming disk using interferometric observations of molecular gas.
- Built & tested the scattering properties of electronic oscillator circuits modeling optical systems.

Education

Ph.D. in Astronomy The University of Texas at Austin, Austin, TX **2023**

Concentration in Communicating Science

Dissertation Title: *Kernel-Phase Interferometry for Detection of Close in Companions:*

Demographics of Binary Brown Dwarfs from Birth to Maturity

M.A. in Astronomy Wesleyan University, Middletown, CT **2015**

Thesis Title: *ALMA Observations of Molecular Gas Emission from a Protoplanetary Disk in the Orion Nebula*

B.A. in Physics and Computer Science Wesleyan University, Middletown, CT **2014**

ΦBK Honor Society, GPA: 3.93/4.0

Communication

Efficient and effective verbal and written communication skills to a wide range of audiences:

- Technical/scientific: presented at domestic and international conferences (full list [here](#)), multiple publications in and referee for peer-reviewed Astronomy & Physics journals (see below or [here](#))
- Non-technical: speaker at [outreach events](#), staff writer for [astrobites.org](#), TA for seven courses

Proven track record of proposing innovative science programs: lead author and science-PI of 3 highly competitive space telescope programs (*HST* & *JWST*) as a graduate student including securing significant funding (\$400,605) and culminating in presentations and publications.

Professional Development

- Selected Graduate and Undergraduate Coursework:
 - Astronomy: Astronomical Instrumentation, Observational Astronomy, Planetary Astrophysics (incl. orbital dynamics)
 - Technical tools: Bayesian Statistical Methods, Computational Physics, Software Engineering, Algorithms and Complexity
- Institute for Scientist & Engineer Educators (ISEE) Professional Development Program (2018)
Intensive teaching workshop focusing on inquiry, assessment, and equity & inclusion.

Leadership & Collaboration

- Organizing committee of [Astronomy on Tap: Austin, TX](#) (2016–present)
Monthly public talks on cutting edge astronomy in a bar, drawing crowds of 200–300 people
- Teaching Assistant for seven courses at UT Austin and Wesleyan University
- Organized & lead four instructional trips to McDonald Observatory for graduate & undergrad students
- Computer Officer, Astronomy Graduate Student Executive Committee, UT Austin, (2017–2021)
- Member of the Direct Imaging and Spectroscopy of Exoplanetary Systems JWST ERS collaboration
- Member of the [astrobites](#) collaboration (author and webmaster 2018–2019)
- Masters rowing coach at [Austin Rowing Club](#), 4 year collegiate varsity athlete (Wesleyan University)
- National Outdoor Leadership School (NOLS) alumni, SCUBA certified (28 dives, 20 hours)

Honors and Awards

- *HST* (Cycles 24 & 29) and *JWST* (Cycle 1) archival program grants totaling: \$400,605
- University Graduate Continuing Fellowship, UT Austin (\$40,804)
- Board of Visitors Graduate Student Second Year Research Defense Award, UT Austin
- Frank N. Edmonds, Jr. Memorial Fellowship in Astronomy, UT Austin
- ΦBK, Wesleyan University
- Barry M. Goldwater Scholarship, Honorable Mention

Selected Publications (+10 non first author publications, complete list can be found [here](#))

- *NICMOS Kernel-Phase Interferometry II: Demographics of Nearby Brown Dwarfs* (Samuel M. Factor & Adam L. Kraus, 2023, *The Astronomical Journal*, 165, 130)
- *NICMOS Kernel-Phase Interferometry I: Catalogue of Brown Dwarfs Observed in F110W and F170M* (Samuel M. Factor & Adam L. Kraus, 2022, *The Astronomical Journal*, 164, 244)
- *ALMA Observations of Asymmetric Molecular Gas Emission from a Protoplanetary Disk in the Orion Nebula* (Samuel M. Factor, A. M. Hughes, et al., 2017, *The Astronomical Journal*, 153, 233)