Samuel M. Factor

Postdoctoral research fellow

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| **✉** [smfactor0@gmail.com](mailto:smfactor0@gmail.com) | 🕻 608-852-5853 | 🌐 [smfactor.github.io](https://smfactor.github.io/) | **📍** Austin, TX, Willing to relocate |

# Summary and Highlighted Qualifications

Innovative researcher and problem-solver seeking to transition into the aerospace industry. Broad expertise in space-based remote sensing, novel image processing algorithms, statistical data analysis, and physical modeling with optical & mechanical lab experience acquired through a Ph.D. in Astronomy. Quick learner with a proven ability to efficiently apply new skills & effectively communicate complex ideas.

* Expert Python and Linux programmer
* Published scientific author and expert oral communicator to technical and non-technical audiences
* Adaptive and creative problem-solver
* Collaborative team member & leader
* Data Science: Effective data visualization, Bayesian modeling/optimization, machine learning
* Space-based remote sensing: astronomical infrared image processing/analysis, high resolution dim target detection
* Instrumentation/engineering: design, review & fabrication of optical, mechanical, electronic and interface systems

# Experience

## Software Engineer & Data Scientist, Postdoctoral Fellow, UT Austin 2023–Present

* Lead proposal author & principal investigator of a Cycle 1 *JWST* program (**$145,090**).
* Assessing performance (strengths, weaknesses, and best practice observing strategies) of *JWST* infrared high-resolution kernel-phase imaging to maximize the yield of valuable telescope time.

## Observational Astrophysicist & Data Scientist, Graduate Student Researcher, UT Austin 2015–2023

* Lead author & principal investigator of 2 *HST* programs (**$255,515**), 2 publications +1 in prep.
* Developed python-based processing & analysis pipelines on the Texas Advanced Computing Center.
* Applied a novel interferometric postprocessing technique which enabled the detection of dim targets at 2-3 times tighter separations than with classical methods, down to half the diffraction limit. Assessed the sensitivity limits of the technique to measure false-positive and false-negative rates.
* Studied the formation of low-mass binary stars using *Hubble Space Telescope* (*HST*) infrared imaging/remote sensing. Optimized a model of the companion distribution to investigate formation mechanisms and found evidence that dynamical evolution sculpts young low-mass binaries.

## Science Communicator, Teaching Assistant/Volunteer, UT Austin/AoTATX/astrobites 2014–Present

* Presented research at 15+ domestic and international scientific conferences
* Lectured in 2 courses, received overwhelmingly positive feedback on learning outcomes
* Organized & presented public talks at Astronomy on Tap ATX & McDonald Observatory
* Wrote [articles](https://astrobites.org/author/sfactor/) summarizing cutting edge astronomy papers to an undergrad-level audience

## Software/Electronics Engineer, Grad/Undergrad 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 RF electronic oscillator circuits modeling optical systems.

# Education

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

Concentration in Communicating Science, GPA: 4.0

## M.A. in Astronomy, GPA: 4.0 Wesleyan University, Middletown, CT 2015

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

ΦBK Honor Society, GPA: 3.93

# Skills

* Programing: Fluent in: Python, bash (Unix/Linux), git. Familiar with: C, Fortran, SQL, slurm
* Statistics: Bayesian inference and optimization, Markov chain Monte Carlo, nested sampling, familiar with and eager to further explore computer vision & machine learning methods/frameworks in Python
* Selected Astronomy courses: Planetary Astrophysics (incl. orbital mechanics), Astronomical Instrumentation (design, review, & fabrication of optical, mechanical, electronic, & interface systems including basic Zemax, LabView, SolidWorks, & machine shop experience)
* Technical courses: Computational Physics (N-body simulation, numerical integration, root-solving, etc.), Software Engineering (agile project management: Jira, Confluence), Algorithms and Complexity

# Professional Development, Leadership, and Collaboration

* UCSC Institute for Scientist & Engineer Educators (ISEE) Professional Development Program (2018)

Intensive teaching workshop focusing on inquiry, assessment, and equity & inclusion

* Organizing committee of [Astronomy on Tap: Austin, TX](https://www.aotatx.org/) (2016–present)

Monthly public talks on cutting edge astronomy to crowds of 200–300 people

* Organized & lead 4 instructional trips to McDonald Observatory for grad & undergrad students
* Member of the Direct Imaging & Spectroscopy of Exoplanetary Systems *JWST* ERS team
* Member of the [astrobites](http://astrobites.org/) collaboration (staff writer 2018–2019 and webmaster)
* Computer Officer, UT Austin Astronomy Graduate Student Executive Committee, (2017–2021)
* Coach at [Austin Rowing Club](https://austinrowing.org/meet-our-coaches/) (2017–present), four-year collegiate varsity athlete (Men’s Rowing)
* National Outdoor Leadership School (NOLS) alumni, open water SCUBA + dry suit (28 dives, 20 hrs)

# Honors and Awards

* Lead author & PI of 3 space telescope programs ($400,605, *HST* Cycles 24 & 29, *JWST* Cycle 1)
* University Graduate Continuing Fellowship, UT Austin ($40,804, 2018)
* Board of Visitors Graduate Student Second Year Research Defense Award, UT Austin (2017)
* Frank N. Edmonds, Jr. Memorial Fellowship in Astronomy, UT Austin (2016)
* ΦBK honor society, Wesleyan University (2014)
* Barry M. Goldwater Scholarship, Honorable Mention (2013)

# Communication

Expert author and oral presenter to diverse audiences:

* + Technical/scientific: 13 publications in and referee for peer-reviewed Astronomy & Physics journals, 15+ presentations at domestic & international conferences
  + Non-technical: staff writer for [astrobites.org](https://astrobites.org/author/sfactor/), speaker at [outreach events](https://smfactor.github.io/aboutme/), TA for 7 courses

Proven track record of successfully pitching innovative science programs: lead author of 3 accepted proposals to highly competitive space telescopes (*HST* & *JWST*) as a graduate student, securing significant funding ($400,605) and culminating in presentations & publications

# Selected Publications (complete list and CV: <http://smfactor.github.io/publications/>)

* [*NICMOS Kernel-Phase Interferometry II: Demographics of Nearby Brown Dwarfs*](https://ui.adsabs.harvard.edu/abs/2023AJ....165..130F) (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*](https://ui.adsabs.harvard.edu/abs/2022AJ....164..244F) (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*](https://ui.adsabs.harvard.edu/abs/2017AJ....153..233F) (Samuel M. Factor, A. M. Hughes, et al., 2017, *The Astronomical Journal*, 153, 233)