Samuel M. Factor

POSTDOCTORAL RESEARCH FELLOW

smfactor0@gmail.com 608-852-5853 smfactor.github.io Austin, TX, Willing to relocate

Summary and Highlighted Qualifications

Highly motivated 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, physical modeling, and 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 author and expert oral communicator to technical and non-technical audiences
- Adaptive and creative problem-solver
- Curious and innovative researcher
- Data Scientist: Effective data visualization, Bayesian optimization of non-linear models, numerical methods
- Space-based remote sensing: astronomical image processing and analysis, high resolution/contrast imaging
- Astronomical Instrumentation: 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 strengths, weaknesses, and best practice observing strategies for *JWST* 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 analysis pipelines run on the Texas Advanced Computing Center (TACC).
- Applied a novel interferometric postprocessing technique which enabled the detection of faint point-sources 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*) 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. **2014–Present**

- Lectured in two undergrad courses, received overwhelmingly positive feedback on learning outcomes
- Organized & presented public outreach talks at Astronomy on Tap, ATX & McDonald Observatory

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

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

B.A. in Physics and Computer Science — Wesleyan University, Middletown, CT **2014**
ΦBK Honor Society, GPA: 3.93/4.0

Communication

Expert author and oral presenter to diverse audiences: (full list http://smfactor.github.io/publications/)

- Technical/scientific: 13 publications in and referee for peer-reviewed Astronomy & Physics journals (3 as lead author), 15+ presentations at domestic & international conferences
- Non-technical: staff writer for astrobites.org, speaker at outreach events, TA for 7 courses

Proven track record of successfully proposing 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.

Professional Development, Leadership, and Collaboration

- 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 (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 collaboration (staff writer 2018–2019 and webmaster)
- Computer Officer, Astronomy Graduate Student Executive Committee, UT Austin, (2017–2021)
- Coach at Austin Rowing Club (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 (*HST* Cycles 24 & 29, *JWST* Cycle 1, $400,605)
- 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)

Skills

- Programing: Fluent in: Python, bash (Linux/Unix), git. Familiar with: C, Fortran, SQL, slurm
- Statistics: Bayesian inference and optimization (Markov chain Monte Carlo, nested sampling)
- 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

Selected Publications (complete list http://smfactor.github.io/publications/)

- *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)

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