

SAMUEL M. FACTOR

Curriculum Vitae

Univ. of Texas at Austin Dept. of Astronomy, 2515 Speedway, Stop C1400, Austin, TX 78712

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EDUCATION

The University of Texas at Austin, Austin, TX

Ph.D., Astronomy (Advisor: Dr. Adam Kraus) (expected) 2023

Wesleyan University, Middletown, CT

M.A., Astronomy (Advisor: Dr. A. Meredith Hughes) 2015

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

B.A., Physics and Computer Science, $\Phi B K$ Honor Society, GPA: 3.93 2014

RESEARCH EXPERIENCE

Graduate Student Researcher Advisor: Dr. Adam L. Kraus 2015–Present

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

- Applying an interferometric analysis technique to archival HST imaging to search for sub-stellar and planetary mass companions to nearby stars below the diffraction limit.
- Demographic analysis of companions in the field and young star-forming regions.
- Analysis utilized the Lonestar5 & 6 clusters at the Texas Advanced Computing Center (TACC).

Graduate Student Researcher Advisor: Dr. A. Meredith Hughes 2014–2015

Astronomy Department, Wesleyan University, Middletown, CT

- Modeled the temperature and density structure of a protoplanetary disk in the Orion Nebula Cluster using Atacama Large Millimeter/submillimeter Array observations of molecular gas.
- Analysis utilized Wesleyan University's High Performance Compute Cluster.

Undergraduate Research Assistant Advisor: Dr. Fred Ellis 2012–2014

Physics Department, Wesleyan University, Middletown, CT

- Built and tested the scattering properties of electronic circuits modeling optical systems.
- Research topics include: PT-symmetric systems, wave transport, asymmetric transport, nonlinear systems, unidirectional lasing.

FUNDING

Kernel-Phase Detection Limits for Planet Discovery with JWST \$145,090

PI of Cycle 1 James Webb Space Telescope Archival Research Grant 2509 2021

Discovery of Young Planetary Systems with Kernel-Phase Interferometry \$114,085

PI of Cycle 29 Hubble Space Telescope Archival Research Grant 16612 2021

University Graduate Continuing Fellowship \$40,804

The University of Texas at Austin Graduate School 2018

Kernel-Phase Interferometry for Super-resolution Detection of Faint Companions \$141,430

PI of Cycle 24 Hubble Space Telescope Archival Research Grant 14561 2016

John W. Cox Graduate Excellence Fellowship \$18,000

University of Texas at Austin Dept. of Astronomy recruiting Fellowship 2015

Travel to: 225th Meeting of the American Astronomical Society \$1,000

PI of Student Travel Grant, CT Space Grant College Consortium 2015

OUTREACH AND SERVICE

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| Astronomy on Tap, Austin TX , Organizing Committee and Speaker | 2016–Present |
| Present free, accessible astronomy talks in a bar to ~ 300 people monthly. Watch my talks on my website . | |
| Astrobites , Author and Webmaster | 2018–2019 |
| Wrote brief paper summaries accessible to undergraduate level students. Read my posts on astrobites.org | |
| Graduate Student Observing Trip , Trip Leader | 2023 |
| Co-lead trip to McDonald Observatory to teach early career graduate students about observing | |
| TAURUS Summer Program , Observing Trip Committee, Webmaster, Informal Mentor 2017, 2019, 2021 | |
| Organized and lead the REU program’s observing trip to McDonald Observatory. | |
| UT Austin Girl Day Festival , Volunteer | 2017, 2018, 2021, 2023 |
| Facilitated hands on astronomy activities for over 8,000 middle school girls and their families. | |
| Astronomy Graduate Student Executive Committee , UT Austin, Computer Officer | 2017–2021 |
| Ask an Astronomer , Author, askanastronomer.org | 2015–2016 |
| Public Observing , Van Vleck Observatory, Wesleyan University, Middletown, CT | 2014–2015 |

TEACHING EXPERIENCE

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| Institute for Scientist & Engineer Educators Professional Development Prog. | 2018,2020(canceled) |
| Intensive teaching workshop focusing on inquiry, equity & inclusion, and assessment. | |
| Teaching Assistant <i>Department of Astronomy, The University of Texas at Austin, Austin, TX</i> | |
| AST 307: Introductory Astronomy, Prof. Brendan Bowler | Fall 2020 |
| AST 376/392G: Observational Methods in Astronomy, Profs. A. Kraus & S. Finkelstein | Fall 2018 |
| AST 301: Introduction to Astronomy, Prof. John Scalzo | Fall 2015 |
| Teaching Assistant <i>Astronomy Department, Wesleyan University, Middletown, CT</i> | |
| ASTR 107: The Universe, ASTR 211: Observational Astronomy, Prof. A. Meredith Hughes | 2014–2015 |
| Course Assistant <i>Computer Science and Physics Departments, Wesleyan University, Middletown, CT</i> | |
| COMP 112: Intro. to Programming, Prof. James Lipton | Summer 2012 |
| PHYS 215: Special Relativity, Prof. Fred Ellis | Fall 2013 |

HONORS & AWARDS

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| Board of Visitors Graduate Student Second Year Research Defense Award , UT Austin | 2017 |
| Chambliss Astronomy Achievement Award , Honorable Mention, AAS | Winter, 2016 |
| Frank N. Edmonds, Jr. Memorial Fellowship in Astronomy , UT Austin | 2016 |
| ΦBK , Wesleyan University | Spring, 2014 |
| Barry M. Goldwater Scholarship , Honorable Mention | 2013 |
| Karl Van Dyke Prize , Wesleyan University Physics Dept. | 2013 |
| Dean’s List , Wesleyan University | 2010 - 2014 |

OBSERVING EXPERIENCE

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| JWST Cycle 1 (Archival) | (see Funding) |
| HST NICMOS, ACS, Cycle 24, 29 (Archival) | (see Funding) |
| 0.8m Telescope, PFC, McDonald Observatory (P.I. Observing Course) | >30 nights |
| 0.9m Telescope, eyepiece, McDonald Observatory (P.I. Graduate Student Course) | 4 nights |
| Harlan J. Smith 2.7m, DIAFI, McDonald Observatory (P.I. TAURUS, Observing Course) | 4 nights |
| HJS 2.7m, GCMS (VIRUS-P), McDonald Observatory (P.I. TAURUS) | 3 nights |
| HJS 2.7m, Tull Coude Spectrograph (TS23), McDonald Obs. (P.I. A. Rizzuto, Observing Course) | 12 nights |
| Keck II, NIRC2 LGS, Mauna Kea Observatory, (P.I. A. Mann) | 1 night |

PUBLICATIONS

- S. Factor** & A. L. Kraus, 2023, *AJ*, 165, 130, “[NICMOS Kernel-Phase Interferometry II: Demographics of Nearby Brown Dwarfs](#)”
- S. Factor** & A. L. Kraus, 2022, *AJ*, 164, 244, “[NICMOS Kernel-Phase Interferometry I: Catalogue of Brown Dwarfs Observed in F110W and F170M](#)”
- S. Factor**, A. M. Hughes, K. Flaherty, R. K. Mann, J. Di Francesco, J. P. Williams, L. Ricci, B. C. Matthews, J. Bally, D. Johnstone, 2017, *AJ*, 153, 233, “[ALMA Observations of Asymmetric Molecular Gas Emission from a Protoplanetary Disk in the Orion Nebula](#)”
- A. Carter et al. (incl. **S. Factor**), *accepted*, “[The JWST Early Release Science Program for Direct Observations of Exoplanetary Systems I: High Contrast Imaging of the Exoplanet HIP 65426 b from 2-16 \$\mu\text{m}\$](#) ”
- B. Miles et al. (incl. **S. Factor**), 2023, *ApJL*, 946, L6, “[The JWST Early Release Science Program for Direct Observations of Exoplanetary Systems II: A 1 to 20 Micron Spectrum of the Planetary-Mass Companion VHS 1256-1257 b](#)”
- S. Hinkley et al. (incl. **S. Factor**), 2022, *PASP*, 134, 095003, “[The JWST Early Release Science Program for the Direct Imaging & Spectroscopy of Exoplanetary Systems](#)”
- A. W. Mann et al. (incl. **S. Factor**), 2019, *ApJ*, 871, 63, “[How to Constrain Your M Dwarf. II. The Mass–Luminosity–Metallicity Relation from 0.075 to 0.70 Solar Masses](#)”
- J. M. Lee, **S. Factor**, Z. Lin, I. Vitebskiy, F. Ellis, T. Kottos, “[Reconfigurable directional lasing modes in cavities with generalized \$\mathcal{PT}\$ Symmetry](#),” *Phys. Rev. Lett.*, vol 112, p. 253902, Jun 2014
- M. Chitsazi, **S. Factor**, J. Schindler, H. Ramezani, F. M. Ellis and T. Kottos, “[Experimental observation of lasing shutdown via asymmetric gain](#),” *Phys. Rev. A*, vol. 89, p. 043842, Apr 2014
- N. Bender, **S. Factor**, J. D. Bodyfelt, H. Ramezani, D. N. Christodulides, F. M. Ellis, and T. Kottos, “[Observation of asymmetric transport in structures with active nonlinearities](#),” *Phys. Rev. Lett.*, vol. 110, p. 234101, June 2013

PRESENTATIONS

- HST Kernel-Phase Interferometry: Field-Age Brown Dwarf Population Demographics ([poster](#)), *21st Cambridge Workshops of Cool Stars, Stellar Systems, and the Sun*, July 2022, Toulouse, France
- A NICMOS Kernel-Phase Interferometry Survey of Brown-Dwarf Binary Demographics ([invited talk](#)), *CfA Stars & Planets Seminar*, December 2021, Center for Astrophysics, Cambridge, MA
- A NICMOS Kernel-Phase Interferometry Survey of Brown-Dwarf Binary Demographics (invited talk), *Stars and Planets Lunch And Talks (SPLAT)*, November 2021, Institute for Astronomy, Manoa, HI
- A NICMOS Kernel-Phase Interferometry Survey of Brown-Dwarf Binary Demographics ([talk](#)), *Virtual Masking Hackathon*, July 2021, Virtual
- Kernel-Phase Interferometry for Super-Resolution Detection of Faint Companions ([poster](#)), *20.5th Cambridge Workshops of Cool Stars, Stellar Systems, and the Sun*, March 2021, Virtual
- Kernel-Phase Interferometry for Super-Resolution Detection of Faint Companions ([poster](#)), *Extreme Solar Systems IV*, August 2019, Reykjavik, Iceland
- Kernel-Phase Interferometry for Super-Resolution Detection of Faint Companions ([poster](#)), *Stars: Birth and Death, 6th Annual GMT Community Science Meeting*, September 2018, Honolulu, HI
- Kernel-Phase Interferometry for Super-Resolution Detection of Faint Companions ([poster](#)), *20th Cambridge Workshop of Cool Stars, Stellar Systems, and the Sun*, August 2018, Boston, MA
- Kernel-Phase Interferometry for Super-Resolution Detection of Faint Companions ([poster](#)), *Star and Planet Formation in the Southwest 2*, March 2018, Oracle, AZ

Are we alone? Finding and characterizing planets around other stars (invited talk),
McDonald Observatory Board of Visitors Recruiting Event, February, 2018, Houston, TX

Kernel-Phase Interferometry for Super-Resolution Detection of Faint Companions ([poster](#) number [118.03](#)),
230th Meeting of the AAS, June 2017, Austin, TX

Kernel-Phase Interferometry for Super-Resolution Detection of Faint Companions ([poster](#) number [146.25](#)),
229th Meeting of the AAS, January 2017, Grapevine, TX (Chambliss Honorable Mention)

Git is great! ([slides](#)),
UT Austin Graduate Student Postdoc Seminar, November 2016, Austin, TX

Kernel-Phase Interferometry for Super-Resolution Detection of Faint Companions ([poster](#)),
Sagan Exoplanet Summer Workshop, July 2016, Pasadena, CA

ALMA Observations of Molecular Gas Emission from a Protoplanetary Disk in the Orion Nebula Cluster
([poster](#)), *Frank N. Bash Symposium*, October 2015, Austin, TX

Characterizing a Young Protoplanetary Disk in the Orion Nebula Cluster ([poster](#) number [349.06](#)),
225th Meeting of the American Astronomical Society, January 2015, Seattle, WA

PROGRAMMING LANGUAGES & SOFTWARE

Python, Git, L^AT_EX, MIRIAD, CASA, Mathematica, C, Ruby, Rails, Java, Visual Basic, SML, Agda

EXTRACURRICULAR ACTIVITIES

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| Volunteer Coach , Austin Rowing Club | 2017–Present |
| Certified Open Water Diver , PADI (28 dives) | 2013–Present |
| Volunteer Assistant Coach , Wesleyan University Men’s Varsity Rowing | Fall, 2015 |
| Wesleyan University Men’s Varsity Rowing | 2010–2014 |
| NESCAC All Sportsmanship Team, New England Small College Athletic Conference | 2014 |
| NESCAC All Academic Team, New England Small College Athletic Conference | 2012–2014 |
| Stewards’ All Academic Team, Eastern College Athletic Conference | 2012–2014 |
| New England Rowing Championships Men’s JV 8+, 3rd place | 2013, 2014 |
| Head of the Charles Men’s Collegiate 8+, 5th place | 2013 |