

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) 2022
- 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, ΦBK 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.
 - Analysis utilized the Lonestar5 cluster 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.

OUTREACH AND SERVICE

- 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
- 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
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 2015–2016
Answered questions from the public through askanastronomer.org
- Public Observing**, Van Vleck Observatory, Wesleyan University, Middletown, CT 2014–2015
Helped host weekly public observing and kids nights.

TEACHING EXPERIENCE

Institute for Scientist & Engineer Educators Professional Development Prog. 2018,2020(canceled)
Intensive teaching workshop focusing on inquiry, equity & inclusion, and assessment.

Teaching Assistant *Department of Astronomy, The University of Texas at Austin, Austin, TX*

AST 307: Introductory Astronomy, Prof. Brendan Bowler Fall 2020

AST 376/392G: Observational Methods in Astronomy, Prof. A. Kraus & Prof.S. Finkelstein Fall 2018

AST 301: Introduction to Astronomy, Prof. John Scalo Fall 2015

Teaching Assistant *Astronomy Department, Wesleyan University, Middletown, CT*

ASTR 107: The Universe, ASTR 211: Observational Astronomy 2014–2015

Course Assistant *Computer Science and Physics Departments, Wesleyan University, Middletown, CT*

COMP 112: Intro. to Programming, Prof. James Lipton Summer 2012

PHYS 215: Special Relativity, Prof. Fred Ellis Fall 2013

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

HONORS & AWARDS

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

PUBLICATIONS

S. Factor & A. L. Kraus (in prep.) “NICMOS Kernel-Phase Interferometry II: Demographics of Nearby Brown Dwarfs”

S. Factor & A. L. Kraus, 2022, *The Astronomical Journal* (in press) “[NICMOS Kernel-Phase Interferometry I: Catalogue of Brown Dwarfs Observed in F110W and F170M](#)”

S. Hinkley et al. (incl. **S. Factor**), 2022, *Publications of the Astronomical Society of the Pacific* (in press) “[The JWST Early Release Science Program for the Direct Imaging & Spectroscopy of Exoplanetary Systems](#)”

A. W. Mann et al. (incl. **S. Factor**), 2019, *The Astrophysical Journal*, 871, 63, “[How to Constrain Your M Dwarf. II. The Mass–Luminosity–Metallicity Relation from 0.075 to 0.70 Solar Masses](#)”

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, *The Astronomical Journal*, 153, 233, “ALMA Observations of Asymmetric Molecular Gas Emission from a Protoplanetary Disk in the Orion Nebula”

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

OBSERVING EXPERIENCE

JWST Cycle 1	(see Funding)
HST NICMOS, ACS, Cycle 24, 29	(see Funding)
0.8m Telescope, PFC, McDonald Observatory (P.I. Observing Course)	>30 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

PROGRAMMING LANGUAGES & SOFTWARE

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

EXTRACURRICULAR ACTIVITIES

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