

# 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

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**The University of Texas at Austin**, Austin, TX  
**Ph.D.**, Astronomy (Advisor: Dr. Adam Kraus) (expected) 2021  
**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, GPA: 3.93 2014

### RESEARCH EXPERIENCE

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**Graduate Student Researcher** Advisor: Dr. Adam 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 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.

### TEACHING EXPERIENCE

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**Teaching Assistant** AST 307: Introductory Astronomy Fall 2020  
*Department of Astronomy, The University of Texas at Austin, Austin, TX*  
**Teaching Assistant** AST 376/392G: Observational Methods in Astronomy Fall 2018  
*Department of Astronomy, The University of Texas at Austin, Austin, TX*  
**Institute for Scientist & Engineer Educators Professional Development Program** 2018  
Intensive teaching workshop focusing on inquiry, equity & inclusion, and assessment.  
**Teaching Assistant** AST 301: Introduction to Astronomy Fall 2015  
*Department of Astronomy, The University of Texas at Austin, Austin, TX*  
**Teaching Assistant** ASTR 107: The Universe, ASTR 211: Observational Astronomy 2014–2015  
*Astronomy Department, Wesleyan University, Middletown, CT*  
**Course Assistant** COMP 112: Intro. to Programming, PHYS 215: Special Relativity 2012, 2013  
*Computer Science and Physics Departments, Wesleyan University, Middletown, CT*

## 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

## FUNDING

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<i>Kernel-Phase Detection Limits for Planet Discovery with JWST</i>	
PI of Cycle 1 James Webb Space Telescope Archival Research Grant 2509, 2021	\$TBD
<i>Discovery of Young Planetary Systems with Kernel-Phase Interferometry</i>	
PI of Cycle 29 Hubble Space Telescope Archival Research Grant 16612, 2021	\$TBD
<i>University Graduate Continuing Fellowship</i>	
The University of Texas at Austin Graduate School, 2018-2019	~\$40,000
<i>Kernel-Phase Interferometry for Super-resolution Detection of Faint Companions</i>	
PI of Cycle 24 Hubble Space Telescope Archival Research Grant 14561, 2016	\$141,430
<i>John W. Cox Graduate Excellence Fellowship</i>	
University of Texas at Austin Dept. of Astronomy recruiting Fellowship, 2015	~\$18,000
<i>Travel to: 225th Meeting of the American Astronomical Society</i>	
PI of Student Travel Grant, CT Space Grant College Consortium, 2015	\$1,000

## PUBLICATIONS

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- Mann, A. W. et al. 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](#)” (**10th author**)
- 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

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- 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

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

## OUTREACH AND SERVICE

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<b>Astrobites</b> , Author <a href="http://astrobites.org">astrobites.org</a> Write brief paper summaries accessible to undergraduate level students.	2018–2019
<b>Astronomy Graduate Student Executive Committee</b> , UT Austin, Computer Officer	2017–2021
<b>Astronomy on Tap Austin TX</b> , Organizing Committee and Speaker Present free, accessible astronomy talks in a bar to $\sim 300$ people monthly.	2016–Present
<b>TAURUS Summer Program</b> , McDonald Trip Committee, Webmaster Organized and lead the program’s observing trip to McDonald Observatory.	2017, 2019
<b>UT Austin Girl Day Festival</b> , Volunteer Facilitated hands on astronomy activities for over 8,000 middle school girls and their families.	2017, 2018, 2021
<b>Ask an Astronomer</b> , Author Answered questions from the public through <a href="http://askanastronomer.org">askanastronomer.org</a>	2015–2016
<b>Public Observing</b> , Van Vleck Observatory, Wesleyan University, Middletown, CT Helped host weekly public observing and kids nights.	2014–2015

## OBSERVING EXPERIENCE

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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

## MEMBERSHIPS

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Junior Member, American Astronomical Society	2015–Present
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## PROGRAMMING LANGUAGES & SOFTWARE

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Python, Git, L<sup>A</sup>T<sub>E</sub>X, MIRIAD, CASA, Mathematica, C, Ruby, Rails, Java, Visual Basic, SML, Agda

## EXTRACURRICULAR ACTIVITIES

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