

Dr. Brian E. Svoboda

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RESEARCH INTERESTS High-mass star and cluster formation, starless molecular cloud clumps and infrared dark clouds, gas inflow and filaments in star formation, deuterium chemistry, interstellar dust grain properties, radio/(sub-)millimeter tools and techniques, open source software

PROFESSIONAL PREPARATION **Jansky Fellow**, National Radio Astronomy Observatory **July 2018 to present**
Ph.D. Astronomy and Astrophysics, University of Arizona **2018**
Starless Clumps and the Earliest Phases of High-Mass Star Formation in the Milky Way. Supervised by Prof. Yancy L. Shirley
M.S. Astronomy, University of Arizona **2014**
B.S. Physics, Western Washington University **2012**

HONORS AND AWARDS **National Radio Astronomy Observatory Jansky Fellowship** 2018
SOFIA General Observing Grant (\$60,000) 2017
National Science Foundation Graduate Research Fellowship 2012–2017
Awardee, Willard and Anne Brown Astronomy Scholarship, WWU 2009–2012

SELECTED SUCCESSFUL OBSERVING PROPOSALS **Co-I, 152 hr, Atacama Large Millimeter Array** Cycle 6 2018
Large Program, Fifty AU Study of the chemistry in the disk/envelope system of Solar-like protostars (FAUST)
PI, 6 hr, Stratospheric Observatory for Infrared Astronomy Cycle 6 2018
A systematic survey of magnetic field orientation in massive quiescent clumps
PI, 37 hr, Atacama Large Millimeter Array Cycle 5 2018
A systematic survey of dense gas kinematics and filamentary flows in massive quiescent clumps
Co-I, 360 hr, Atacama Large Millimeter Array Cycle 5 2017
Large Program, ALMA-IMF: ALMA transforms our view of the origin of stellar masses
PI, 4 hr, Robert C. Byrd Green Bank Telescope 17B 2017
A systematic survey of the most massive starless clumps within 5 kpc
PI, 31 hr, Jansky Very Large Array 17A 2017
A systematic VLA survey of the most massive starless clumps within 5 kpc
Co-I, 13 hr, Atacama Large Millimeter Array Cycle 4 2017
Infall towards massive starless clump candidates
Co-I, 60 hr, Robert C. Byrd Green Bank Telescope 17A 2017
ARGUS mapping of infall toward massive starless clump candidates
Co-I, 21 hr, Atacama Large Millimeter Array Cycle 3 2016
A Systematic ALMA Survey of the Most Massive Starless Clumps within 5kpc
PI, 28 hr, Robert C. Byrd Green Bank Telescope 15B 2015
Deuteration and virial state of the most massive starless clumps within 5 kpc

PI, 31 hr, IRAM 30m NIK1A1	Spring 2015
<i>Dust properties in the most massive pre-protoclusters</i>	
PI, 120 hr, ARO Submillimeter Telescope	Fall 2013
<i>Measuring the deuterium fractionation in massive starless clumps</i>	
PI, 40 hr, Robert C. Byrd Green Bank Telescope	13B 2013
<i>Identifying the most complete sample of massive starless clumps in the Milky Way</i>	

TECHNICAL
EXPERIENCE

Extensive programming experience in Python (2 & 3), the standard library, and third-party scientific libraries. Familiarity with IDL, L^AT_EX, Julia, C, Rust, Fortran (95/03), Haskell, Lua, Forth, and Smalltalk (Pharo).

Experience with GNU/Linux system administration and astronomical software: GBTIDL, CASA, GILDAS CLASS, SAOImage DS9 / XPA.

Extensive experience observing, reducing, and analyzing single dish and interferometric, continuum and molecular line mapping data from radio to sub-millimeter wavelengths.

RESEARCH
MENTORSHIP

3. **Mulan Madden**, High School Student, former Astronomy Camper. *Biases in Kinematic Distance Resolution Methods*. 2016–present
2. **Andrew Henrici**, Undergraduate Student, University of Arizona. *Deuterium Fractionation in Starless Clump Candidates*. Co-Advisor: Yancy Shirley. 2015–2018.
1. **Jenny Calahan**, Undergraduate Student, University of Arizona. *Infall in Starless Clump Candidates*. Co-Advisor: Yancy Shirley. 2015–2018.

TEACHING
EXPERIENCE

Guest Lecturer (1 Lecture), Instructor Prof. K. Folette, Fall 2018
Amherst College, ASTR 112: Alien Worlds

Guest Lecturer (1 Lecture), Instructor Dr. K. Garmany, Spring 2015
Tohono O’odham Community College, ASTR 102L: Stars and Galaxies

Graduate Teaching Assistant (4 Lectures), Instructor Prof. J. Biegging, Spring 2015
University of Arizona, ASTR 170: Fundamentals of Astronomy

Graduate Teaching Assistant (3 Lectures), Instructor Prof. B. Frye, Fall 2015
University of Arizona, ASTR 250: Fundamentals of Astrophysics

Physics Teaching Assistant, Western Washington University, 2010–2012

Physics Learning Assistant, Western Washington University, 2010–2012

SELECTED
RESEARCH
TALKS

Astrophysics Seminar, UNM, Albuquerque, *Invited* October 2018

Stars & Planets Seminar, CfA, *Invited* April 2018

American Astronomical Society, Washington D.C., *Contributed* January 2018

Multi-Scale Star Formation Conference, Morelia, *Contributed* April 2017

Origins Seminar, Steward Observatory, Tucson, *Invited* March 2017

Colloquium, GBO, Green Bank, *Invited* March 2017

New Mexico Symposium, NRAO, Socorro, *Contributed* November 2016

From Stars to Massive Stars Conference, Gainesville, *Contributed* March 2016

Lunch Talk, NRAO, Socorro, *Invited* March 2016

Origins Seminar, Steward Observatory, Tucson, *Invited* February 2016

FLASH Talk, NOAO, Tucson, *Contributed* January 2016

Lunch Talk, GBO, Green Bank, *Invited* October 2015
R&G Lunch Talk, SAO/CfA, Cambridge, *Invited* June 2015
Soul of High-mass Star Formation Conference, Puerto Varas, *Contributed* Mar. 2015
Journal Club, Steward Observatory, Tucson, *Contributed* January 2015
SPF Lunch Talk, MPIA, Heidelberg, *Invited* November 2014
Steward Symposium, Steward Observatory, Tucson, *Contributed* October 2014
Journal Club, Steward Observatory, Tucson, *Contributed* October 2013
Journal Club, Steward Observatory, Tucson, *Contributed* March 2013
FLASH Talk, NOAO, Tucson, *Contributed* March 2013

ACADEMIC
SERVICE

AAS Chambliss Judge, 2018
Referee Astrophysical Journal, 2016, 2018
Graduate Admissions Committee, University of Arizona, 2015
Organizer of Code Coffee Talk Series, University of Arizona, 2014–2015
Member American Astronomical Society, 2009–present

OUTREACH

Telescope Volunteer, New Mexico Tech Etsorn Observatory, 2018 to present
Volunteer Presenter, Hitchcock Center for the Environment, 2018
Astronomy Camp Counselor, Astronomy Camp, 2016
Full-time camp counselor for the Beginning and Advanced Teen Astronomy Camps led by University of Arizona Prof. Don McCarthy, 3 weeks.
TIMESTEP Volunteer, 2015–2018
Tucson Initiative for Minority Engagement in Science and TEchnology Program
Science Fair Judge, Arizona School for the Deaf and the Blind, 2015
Interviewed students at all grade levels to judge projects
Tour Guide, Steward Observatory Mirror Lab, 2016
Telescope Volunteer, Grand Canyon Star Party, 2014
Telescope Volunteer, Phoenix Zoo Nights, 2013
Telescope Volunteer, Phoenix Friday Night Art Walk, 2013
Astronomy Camp Volunteer, Astronomy Camp, 2013–2018
Oversaw project design and observations with the ARO 12m & SMT radio telescopes for the Advanced Teen Astronomy Camp led by Dr. Don McCarthy, ~ 4 days per year.
Telescope Volunteer, Arizona State University, 2012–2017
Facilitated guided night sky viewing, discussion, and telescope observing with the public for the School of Earth and Space Exploration (SESE) Open House, bi-monthly program

REFERENCES

Prof. Yancy Shirley

Steward Observatory
University of Arizona
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Tucson, AZ 85719 USA
Office Phone: +1 520.626.3666
Email: yshirley@as.arizona.edu

Prof. John Bally

Center for Astrophysics and Space Astronomy
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Boulder, CO 80309 USA
Office Phone: +1 303.492.5786
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Prof. Cara Battersby

Department of Physics
University of Connecticut
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Storrs, CT 06269 USA
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Email: cara.battersby@uconn.edu

FIRST AUTHOR
PUBLICATIONS
NEAR SUBMISSION

1. “ARGUS and ALMA Mapping of Infall in Starless Clump Candidates”
Svoboda, B. E.; Shirley, Y.; Goldsmith, P.; Church, S.; Frayer, D., — in preparation
2. “The Core Mass Function in Starless Clump Candidates”
Svoboda, B. E.; Shirley, Y.; Battersby, C.; Beuther, H.; Traficante, A., — in preparation
3. “ALMA Observations of Fragmentation, Sub-Structure, and Protostars in Starless Clump Candidates”
Svoboda, B. E.; Shirley, Y.; Traficante, A.; Battersby, C.; Fuller, G.; Beuther, H.; Zhang, Q.; Hunter, H.; Brogan, C., — to be submitted to ApJ January 2017

REFEREED
PUBLICATIONS

1. “The Lifetimes of Phases in High-mass Star-forming Regions”
Battersby, C.; Bally, J.; & **Svoboda, B. E.** 2017, *Astrophysical Journal*, 835, 263
2. “The Bolocam Galactic Plane Survey. XIV. Physical Properties of Massive Starless and Star-forming Clumps”
Svoboda, B. E.; Shirley, Y.; Battersby, C.; Rosolowsky, E.; Ginsburg, A.; Ellsworth-Bowers, T.; Pestalozzi, M.; Dunham, M.; Evans, N. J. II; Bally, J.; Glenn, J. 2016, *Astrophysical Journal*, 822, 59
3. “The Bolocam Galactic Plane Survey. XII. Distance Catalog Expansion Using Kinematic Isolation of Dense Molecular Cloud Structures with $^{13}\text{CO}(1-0)$ ”
Ellsworth-Bowers, T.; Rosolowsky, E.; Glenn, J.; Ginsburg, A.; Evans, N. J., II; Battersby, C.; Shirley, Y. L.; **Svoboda, B. E.**, 2015, *Astrophysical Journal*, 799, 29
4. “The Bolocam Galactic Plane Survey. X. A Complete Spectroscopic Catalog of Dense Molecular Gas Observed toward 1.1 mm Dust Continuum Sources with $7.5^\circ \leq \ell \leq 194^\circ$ ”
Shirley, Y. L.; Ellsworth-Bowers, T. P.; **Svoboda, B. E.**; Schlingman, W. M.; Ginsburg, A.; Rosolowsky, E.; Gerner T.; Mairs, S.; Battersby, C.; Stringfellow, G.; Dunham, M. K.; Glenn, J.; Bally, J. 2013, *Astrophysical Journal Supplements*, 209, 2
5. “Ammonia Thermometry of Star-Forming Galaxies”
Mangum, J. G.; Darling, J.; Henkel, C.; Menten, K. M.; MacGregor, M.; **Svoboda, B. E.**; Schinnerer, E., 2013, *Astrophysical Journal*, 779, 33

SOFTWARE
PUBLICATIONS

1. “Astroquery: Access to online data resources”
Ginsburg, A.; Parikh, M.; Woillez, J.; Groener, A.; Liedtke, S.; Sipocz, B.; Robitaille, T.; Deil, C.; **Svoboda, B. E.**; Tollerud, E.; Persson, M. V.; Séguin-Charbonneau, L.; Armstrong, C.; Mirocha, J.; Droettboom, M.; Allen, J.; Moolekamp, F.; Egeland, R.; Singer, L.; Barbary, K.; Grollier, F.; Shiga, D.; Moritz Günther, H.; Parejko, J.; Booker, J.; Rol, E.; Miller, A.; Willett, K., 2017, *Astrophysics Source Code Library*, ascl:1708.004