Zachary H. Draper
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Education

2012 B.S. in Astronomy and Physics, University of Washington: Seattle, USA

2014 M.Sc. in Astronomy, University of Victoria, BC, Canada

2018 Ph.D. in Astronomy, University of Victoria, BC, Canada

Scholarships:
UW Undergraduate Research Program Travel Award
UW College of Arts and Sciences Undergraduate Research Scholarship
Awards:
UW Department of Astronomy, John E. Baer Award

Research Experience

2014 – Present Ph.D. Graduate Student, Adviser: B. C. Matthews;

2015 – Present Member of the Gemini Planet Imager Debris Disk LLP (PI: Christine Chen)

2013 – Present Member of the Gemini Planet Imager Exoplanet Survey collaboration. (PI: Bruce Macintosh)

2012 – 2014 M.Sc. Graduate Student, Adviser: B. C. Matthews; Thesis on Herschel observations of λ Boo stars, and with C. Marois, Least-square datacube extraction with the Gemini Planet Imager.

2008 – 2012 Research Assistant, Adviser: J.P. Wisniewski

2011 Research Assistant, Washington Space Grant / NASA Summer Undergraduate Research Program, Adviser, J.P. Wisniewski; Created IDL routine to increase speed and efficiency to analyze HPOL survey database.

2010 Research Assistant, NSF REU at the University of Toledo, Adviser K.S. Bjorkman; Modeled Be disk behavior for a newly discovered polarization diagnostic for decretion disk density

Teaching Experience

2013 – Present Teaching Assistant for Astronomy 101 (Exploring the Night Sky) and 150 (Concepts in Modern Astronomy) Labs

2015 Lecture on Atomic Diffusion Theory to A404 (Introduction to Stellar

	Astrophysics) class
2015	Research Talk to Undergrad Jamboree
2015	Lecture on research to A255 (Introduction to Planetary Science) class
2012 – 2013	Marking Assistant for A201 (The Search for Life in the Universe) & A405 (Introduction to Cosmology)

Observing Experience

Facility:	Regime:	Time:
U. Toledo Ritter 1-meter	Optical Spectroscopy	3 nights
UW Manastash Ridge 1-meter	Optical Photometry	8 nights
NASA IRTF 3-meter	Infrared Spectroscopy	2 nights
JAC/EAO - JCMT	Sub-mm Photometry	11 nights
McDonald Obs. Otto Struve	Optical Spectroscopy	4 nights
Gemini-South	Near-IR Infrared AO/IFU	10 nights
Subaru	Near-IR Infrared AO/IFU	1 night
UVic 32-inch	Optical Photometry	∞ nights

Publications

1) **Draper, Z. H.;** *Duchêne, G.; Millar-Blanchaer, M.A.; Matthews, B. C.; Wang, J. J.; Kalas, P.; Graham, J. R.; Padgett, D.; et al.* "The Peculiar Debris Disk of HD 111520 as Resolved by the Gemini Planet Imager". 2016, ApJ, 826, 147

2) **Draper, Z. H.;** *Matthews, B. C.; Kennedy, G. M.; Wyatt, M. C.; Venn, K. A.; Sibthorpe, B.* "IR excesses around nearby Lambda Boo stars are caused by debris discs rather than ISM bow waves", 2016, MNRAS, 456, 459

3) **Draper, Z.H.,** *Marois, C., Wolff, S., Perrin, M., Ingraham, P.J., Ruffio, J.B., Rantakyro, F.T., Hartung, M., Goodsell, S.J.,* "Gemini Planet Imager Observational Calibrations IX: Least-Squares Inversion Flux Extraction", 2014 , SPIE Proceedings, 9147, 91474Z

4) **Draper, Z.H.,** *Wisniewski, J.P., Bjorkman, K.S., Meade, M.R., Haubois, X., Mota, B.C., Carciofi, A.C., & Bjorkman, J.E.,* "Disk Loss and Disk Renewal Phases in Classical Be Stars II: Contrasting with Stable and Variable Disks", 2014, ApJ, 786, 120

5) **Draper, Z.H.,** *Wisniewski, J.P., Bjorkman, K.S., Haubois, X., Carciofi, A.C., Bjorkman, J.E., Meade, M.R., Okazaki, A.,* "A New Diagnostic of the Radial Density Structure of Be Disks", 2011, ApJ, 728L, 40D

6) **Draper, Z.H.,** *Wisniewski, J.P., Bjorkman, K.S., Bjorkman, J.E., Haubois, X., Carciofi, A.C., Meade, M.R.,* "Disk-Loss and Disk Renewal Phases in Classical Be Stars II. Detailed Analysis of Spectropolarimetric Data", 2010, IAU 272 Proceedings, p. 388-389.

7) Wisniewski, J.P., **Draper, Z.H.,** *Bjorkman, K.S., Meade, M.R., Bjorkman, J.E., & Kowalski,*

A.K. "Disk Loss and Disk Renewal Phases in Classical Be Stars I: Analysis of Longterm Spectropolarimetric Data", 2010, ApJ, 709, 1306

Department Seminars

- UC Berkeley, Oct. 4th 2017, "A-type Stellar Abundances: A corollary to *Herschel* observations of debris disks."
- UCLA, Oct. 13th 2017, "A-type Stellar Abundances: A corollary to *Herschel* observations of debris disks."

Conferences

Scientific Organizing Committee:

- NorthWest Astronomy Meeting; Bellingham, WA. Oct, 2016

Contributed Talks:

- Know Thy Star, Know Thy Planet; Pasadena, CA, USA Oct 2017

Poster presentations:

- NorthWest Astronomy Meeting; Bellingham, WA. Oct, 2016
- Characterizing Planetary Systems Across the HR Diagram; Cambridge, UK. July 2014
- SPIE Astronomical Telescopes and Instrumentation; Montreal, QC. June 2014
- AAS Conferences; (215th, 217th, and 219th)
- IAU Symposium 272: Active OB Stars; Paris, France; July 2010
- UW Mary Gates Undergraduate Research Symposium; (2009, 2010, and 2011)

Workshops

JWST Workshop; Montreal, QC, Canada. Oct, 2016
ALMA Summer School; Penticton, BC, Canada. Aug, 2015
Sagan Exoplanet Workshop; Pasadena, CA, USA. July, 2015
GPI PSF Subtraction Workshop; Victoria, BC, Canada. March, 2015
Dunlap Instrumentation Workshop; Toronto, ON, Canada. July, 2012

Outreach

- Public talk given to Royal Astronomical Society of Canada, June, 2016

- Founding Member; Committee for Upgrading the Learning Telescopes (CULT), Improved telescope hardware and worked with students on observing projects.

- UW Pre-Major in Astronomy Program (Pre-Map), Cohort 4, 2008
  Personal statement in "Pre-Major in Astronomy Program", AAS Spark Newsletter, Issue 11, Jan, 2011

- "The Birds and the Bees of Planet Formation", Theodore Jacobson Observatory Newsletter,

Winter/Spring 2012

- Invited Talk; Special Session on Pre-Map Program, AAS 225th Conference

Computer Experience

- Developed **python** pipeline to do analysis for stellar parameters and abundances using spectra from multiple observatories in concert with public databases.
- Co-developer of the Gemini Planet Imager Data Reduction pipeline in **IDL**.
- Developed **IDL** routines to analyze optical spectropolarimetry from Pine Bluff Observatories HPOL instrument's 15 year survey of 75 Classical Be stars.
- Performed Monte Carlo simulations of Classical Be stars using **FORTRAN**, **IDL**, and **MPI** on the University of Toledo's Beowulf cluster, Alfrodull, and on Ohio Super Computer's Glenn cluster.
- Analyzed optical spectroscopy from Ritter Observatory for H-alpha variations using **IRAF**.
- Reduced and analyzed photometry in **IRAF/PyRAF** for Manastash Ridge Observatory (MRO) to characterize SX Phe variables.
- Other relevant programs include; **LaTex**, **gnuplot**, and **Linux**

Society Membership

American Astronomical Society (AAS)
Canadian Astronomical Society (CASCA)