Zachary G. Maas

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Research Interests

Spectroscopic studies of Galactic stellar populations to understand the chemical evolution and production of the light elements, specifically understanding the odd elements and isotope ratios.

Education

Bachelor of Science, Astrophysics and Physics Degrees — May 2014
University of Minnesota - Twin Cities, Minneapolis, MN

Masters of Arts, Astronomy — December 2016
Doctor of Philosophy, Astronomy — May 2019
Minor, Scientific Computing — May 2019
Indiana University - Bloomington, Bloomington IN

Research Experience

Research Assistant — May-August 2015, May-August 2016, July - Present
Advisor: Dr. Catherine Pilachowski
Making high resolution L-band infrared spectroscopy observations and abundance analysis of chlorine in stellar photospheres; J-band infrared spectroscopy and abundance analysis of phosphorus in thin and thick disk stars.

Undergraduate Research Thesis — September 2013 – May 2014
Advisor: Dr. Roberta Humphreys
Analysis of spectra of the yellow supergiant IRC+10420 to determine possible spectral type changes over span of 10 years.

Research Assistant — July - December 2011
Advisor: Dr. Cynthia Cattell
Correlated magnetic field and electric current data with from the Cluster Satellites with images of the aurora.

Teaching Experience

Graduate Instructor of Record
Indiana University — May - June 2017
Co-taught introductory astronomy class with enrolment of 45 students as instructor of record. platform Canvas. Course title was A107: Art of Astronomy and I instructed on the science behind popular astronomical images. Created assessment materials, wrote the syllabus, recorded video lectures, and developed the online course in the online teaching

Associate Instructor
Indiana University — Various Semesters
Developed online course activities and materials, guest lectured, led discussion sections of 10-20 students, set-up and led student rooftop observing sessions and solar lab.

Observing Experience

Gemini South 8.1m Telescope Semester 2017B
One proposal as principle investigator (PI) scheduled for queue observing in 2017B

Gemini North 8.1m Telescope Semester 2017A
One completed queue observing program as principle investigator (PI) scheduled for 2017A.

Astrophyics Research Consortium (ARC) 3.5m Telescope Semester 2016B-2017A
3 Nights observing in semester 2016B as Co-PI.
One PI proposal with 3 nights observed in 2017A.

Gemini South 8.1m Telescope Semester 2016B
Two PI proposals observed completed in queue schedule mode.

NASA Infrared Telescope Facility 3m Telescope Semester 2016A-2016B
Three and a half nights from two proposals as PI

Mayall 4m Telescope Semester 2015A
Six nights from one Co-PI proposal

Computer Skills

Languages: Proficient with Python, experience with C++, R, Linux/Unix shell scripting, Pyraf scripting
Software: IRAF software facility, Matlab, MOOG spectral synthesis software,
Operating Systems: Linux (Ubuntu), Mac, and Windows

Outreach and Service

Lunch Talk Coordinator August 2016 - Present
Scheduled presenters and managed IU astronomy department Lunch Talks; weekly informal talks regarding astronomy research, teaching practices, and other miscellaneous subjects of interest.

Kirkwood Observatory 2014 - Present
Host public observing night and tours at the IU campus Kirkwood Observatory.

Physics and Astronomy Open House 2014-Present
Ran hands-on astronomy demonstrations at Physics and Astronomy Open House, an annual outreach event.

Professional Memberships

Member of the American Astronomical Society 2015-Present

Honors and Awards

Indiana University College of Arts and Sciences McCormick Science Grant 2017

NSF Graduate Research Fellowship Honorable Mention 2015

Refereed Publications

[1] **Maas, Z. G.**, Pilachowski, C. A., and Cescutti, G., *Phosphorus Abundances in FGK Stars*, 2017, ApJ, 841, 108

[2] **Maas, Z. G.**, Pilachowski, C. A., and Hinkle, K., *Chlorine Abundances in Cool Stars*, 2016, AJ, 152, 196

Presentations

[1] **Maas, Z. G.**, & Pilachowski, C.A., *Chlorine Abundances in Cool Stars*, 2016, American Astronomical Society Meeting Abstracts, 227, 345.06

[2] **Maas, Z. G.**, *Temporal and Spatial Variations in the Current and Electric Fields in Different Auroral Structures* , 2012, University of Minnesota Undergraduate Research Symposium