

# JESSE ALAN MILLER

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## EDUCATION

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**University of Illinois Urbana-Champaign** (in progress)  
Expected Ph.D. in May 2021  
Advisor: Brian Fields

**Washington State University** graduated 2014  
BS in Physics (Astrophysics option), *Magna cum laude*  
Minors: Mathematics and Spanish  
WSU Honors College graduate

## TECHNICAL STRENGTHS

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**Computer Languages** Python, C  
**Software & Tools** TALYS, LaTeX, Mathematica, Excel, Shell script

## RESEARCH EXPERIENCE

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**Graduate Research** August 2016 - current  
*University of Illinois Urbana-Champaign*

- Cosmic rays and impactors as the source of the  $^{60}\text{Fe}$  terrestrial supernova signal
- Analyzed Earth impactors for theoretical yields of radioactive isotopes, both standard and novel
- Compared radioisotope production on impactors to measured  $^{60}\text{Fe}$  supernova data
- Calculated nuclear reaction cross-sections with TALYS and compared to nuclear data

**Graduate Research** August 2015 - August 2016  
*University of Illinois Urbana-Champaign*

- Observations of low-redshift supernovae for the Foundation Supernova Survey
- Performed quick data reduction of spectra for classification of supernovae
- Assisted with and performed remote and internal observations with the SOAR telescope

**Undergraduate Thesis Research** August 2012 - May 2014  
*Washington State University*

- Collapsing 3D starburst galaxy outflow to a 2D visual model as applied to M82
- Wrote code to analyze spherically symmetric galaxy outflow based off conservation equations
- Compared modeled outflow to observations of M82 and explained discrepancies
- Fulfilled both Honors College thesis and Department of Physics thesis requirements

**REU Program** June 2012 - August 2012  
*University of Wisconsin Madison*

- Fitting radio spectra of cold and warm atomic hydrogen in the Perseus Molecular Cloud
- Performed over one hundred Gaussian fits to discrete components of the PMC

- Calculated brightness, spin, and kinetic temperatures for given components
- Developed a correction function to determine total hydrogen from observed, warm hydrogen

**Research Assistant**

August 2010 - May 2012

*Washington State University*

- Temperature-dependent hyperfine magnetic field of radioactive indium in nickel defect sites
- Manufactured samples of metals and alloys, including doping them with radioactive indium
- Certified and maintained radiation safety training through WSU

**GRADUATE COURSES**

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**Core Courses**

Astrophysical Dynamics  
 Radiative Processes  
 Stellar Astrophysics  
 Theoretical Stellar Structure (*auditing, in progress*)

**Other Courses**

General Relativity I & II  
 Physics of Compact Objects  
 Planetary Science and the ISM  
 Observational Astronomy

**HONORS AND ACHIEVEMENTS**

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|---|---------------------|
| List of TAs ranked as excellent by their students | Fall 2017           |
| WSU President's Honor Roll                        | 2009-2014           |
| WSU Honors College Scholarships                   | (various) 2012-2014 |
| Phi Beta Kappa Honors Society                     | 2013                |
| WSU Honors Thesis Pass with Excellence            | 2013                |
| WSU Writing Portfolio Pass with Distinction       | 2011                |
| International Baccalaureate Diploma               | 2009                |
| Eagle Scout, Boy Scouts of America                | 2008                |

**WORK EXPERIENCE**

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**Physics & Astronomy Club**

August 2012 - May 2014

*Washington State University*

- Served as President (2013-2014), Vice President (2012-2013) and Secretary (2011-2012)

**Academic Tutor**

August 2013 - May 2014

*Washington State University*

- Tutored astronomy, physics, and math to undergraduates

**Resident Advisor**

August 2010 - May 2013

*Washington State University*

- Resolved conflicts, developed communities, enforced policies, and organized programs

**PUBLICATIONS**

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Foley, R., Scolnic, D., Rest, A., Jha, S., Pan, Y., Riess, A., Challis, P., Chambers, K., Coulter, D., Dettman, K., Foley, M., Fox, O., Huber, M., Jones, D., Kilpatrick, C., Kirshner, R., Schultz, A., Siebert, M., Flewelling, H., Gibson, B., Magnier, E., **Miller, J.**, Primak, N., Smartt, S., Smith, K., Wainscoat, R., Waters, C., & Willman, M. (2018). The Foundation Supernova Survey: motivation, design, implementation, and first data release. *MNRAS*, 475: 193-219.

Lee, M., Stanimirovic, S., Murray, C., Heiles, C., & **Miller, J.** (2015). Cold and warm atomic gas around the Perseus Molecular Cloud II: the impact of high optical depth on the HI column density distribution and its implication for the HI-to-H<sub>2</sub> region. *The Astrophysical Journal*, 809: 56.

Stanimirovic, S., Murray, C., Lee, M., Heiles, C., & **Miller, J.** (2014). Cold and warm atomic gas around the Perseus Molecular Cloud I: Basic properties. *The Astrophysical Journal*, 793:132.

**Miller, J.**, Lee, M., Murray, C., Stanimirovic, S. & Heiles, C. (2013). Cold Atomic Hydrogen in the Perseus Molecular Cloud. *American Astronomical Society*, AAS Meeting #221, #349.12.

**Miller, J.** & Allen, M. (2013). A visual model of a starburst galaxy. Washington State University Honors Thesis.

## TALKS

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|---|----------------|
| Journal Club: Near-Earth supernova activity in the past 35 Myr                    | September 2017 |
| Journal Club: Neutron astronomy   | May 2017       |
| Journal Club: Modeling impactors as the cause of the <sup>60</sup> Fe signal      | April 2017     |
| Seminar: Fantastic neutrinos and how to find them: the Sun and supernovae         | February 2017  |
| Journal Club: A 30th anniversary review of SN1987A                                | February 2017  |
| Journal Club: Interstellar <sup>60</sup> Fe on the surface of the Moon            | October 2016   |
| Undergraduate Thesis Defense: A visual model of a starburst galaxy                | April 2013     |
| Poster: Cold atomic hydrogen in the Perseus Molecular Cloud                       | January 2013   |
| REU talk: The search for cold atomic hydrogen in the Perseus Molecular Cloud      | July 2012      |
| Poster: Temperature dependence of the hyperfine field of Ni from PAC spectroscopy | March 2012     |