

Erika M. Holmbeck

Arthur J. Schmitt Leadership Fellow
Department of Physics, University of Notre Dame
225 Nieuwland Science Hall / Notre Dame, IN 46556
✉ eholmbec@nd.edu

EDUCATION

anticipated **University of Notre Dame**

2020 Ph.D. Physics

Advisors: Profs. Rebecca Surman and Timothy C. Beers

- Theoretical modeling of nucleosynthesis in r -process events
- Observations of very metal-poor, r -process-enhanced stars

Jun 2014 **University of California Los Angeles**

B.S. Astrophysics, *Cum laude*, Departmental Honors, Dean's Honors List

Advisors: Profs. Benjamin Zuckerman and Smadar Naoz

- Identifying New Members of Nearby Moving Groups

RESEARCH AND TEACHING EXPERIENCE

2015 – **University of Notre Dame, Department of Physics**

Graduate Research Student: Advised by Prof. Rebecca Surman

r -Process Nucleosynthesis

- Utilize nucleosynthesis network code to study r -process element formation
- Study the effect of fission on r -process abundances
- Investigate actinide production and correlate with measurements in metal-poor stars

Graduate Research Student: Advised by Prof. Timothy C. Beers

Identifying r -II Stars in the Milky Way Halo

- Observational astronomy; high-resolution follow-up search for r -II stars
- Elemental abundance measurements of r -II stars
- Classifying and identifying new r -process-enhanced stars

2019 Teaching Assistant: Lab Technician for Westville Education Initiative

Instructor: Prof. Lara Arielle Phillips

- Design, prepare, and lead Physics labs for the Moreau College Initiative at Westville Correctional Facility

2015 – 2017 Teaching Assistant: Lead Technician for the Jordan Hall of Science Observatory

Instructor: Prof. Peter Garnavich

- Set up telescopes nightly for and guide undergraduate student projects
- Lead biweekly public observing events

2013 – 2015 **University of California Los Angeles**

Undergraduate Research Assistant, Department of Physics and Astronomy

Identifying New Members of Nearby Moving Groups

- Remote observational astronomy; high-resolution spectroscopy to measure lithium in young stars

PUBLICATIONS

- 2019* *Actinide-rich and Actinide-poor r -Process Enhanced Metal-Poor Stars do not Require Separate r -Process Progenitors*,
Holmbeck, E. M., Frebel, A., McLaughlin, G. C., et al. 2019, ApJ, 881, 5.

Actinide Production in the Neutron-Rich Ejecta of a Neutron Star Merger,
Holmbeck, E. M., Sprouse T. M., Mumpower, M. R., et al. 2019, ApJ, 870, 23.

2018 *The R-Process Alliance: 2MASS J09544277+5246414, the Most Actinide-Enhanced R-II Star Known*,
Holmbeck, E. M., Beers, T. C., Roederer, I. U., et al. 2018, ApJL, 859, L24.

The R-Process Alliance: First Release from the Southern Search for r-Process Enhanced Stars in the Galactic Halo,
Hansen, T. T., **Holmbeck, E. M.**, Beers, T. C., et al. 2018, ApJ, 858, 92.

β -Delayed Fission in R-Process Nucleosynthesis,
Mumpower, M. R., Kawano, T., Sprouse, T. M., [et al., including **Holmbeck, E. M.**]
2018, ApJ, 869, 14.

Californium-254 and kilonova light curves,
Zhu, Y., Wollaeger, R. T., Vassh, N., [et al., including **Holmbeck, E. M.**]. 2018, ApJL, 863, L23.

The R-Process Pattern of a Bright, Highly r-Process-Enhanced, Metal-Poor Halo Star at $[Fe/H] \sim -2$,
Sakari, C. M., Placco, V. M., Hansen, T., **Holmbeck, E. M.**, et al. 2018, ApJL, 854, L20.

2017 *RAVE J203843.2–002333: The First Highly r-Process-Enhanced Star Identified in the RAVE Survey*,
Placco, V. M., **Holmbeck, E. M.**, Frebel, A., et al. 2017, ApJ, 844, 18.

CONFERENCE PROCEEDINGS

2017 *J2038–0023: The First Bright r-Process Enhanced Star Identified in the RAVE Survey*,
Holmbeck, E. M., Placco, V. M., Beers, T. C., et al., 2017, Proceedings of the 14th Symposium on Nuclei in the Cosmos (NIC2016), 020612.

ORAL PRESENTATIONS

2019 **R-Process Sources in the Universe**
“Actinide-Boost Stars may not Suggest a Separate *r*-Process Site” (contributed)
Arizona State University, Tempe, AZ

2018 **Fifth Joint Meeting of the Nuclear Physics Divisions of the APS and JPS**
“Actinide Production in Neutron Star Mergers” (contributed)
Hilton Waikoloa Village, Waikoloa, HI

JINA-CEE Online Seminar
“Actinide Production in Neutron Star Mergers: Observation and Theory” (invited)

2017 **Annual FIRE (Fission In R-process Elements) Meeting**
“Impact of New LANL Fission Rates on the *R*-Process” (contributed)
Lawrence Livermore National Laboratory, Livermore, CA

JINA-CEE Frontiers in Nuclear Astrophysics: Junior Researchers Workshop
“The Hunt for r -II Stars: Constraining the Early r -Process through High-Resolution Spectroscopic Follow-up on the RAVE Survey” (contributed)
Michigan State University, East Lansing, MI

POSTERS

- 2018 **JINA-CEE Frontiers in Nuclear Astrophysics**
“The R -Process Alliance Hunt for r -II Stars”
University of Notre Dame, Notre Dame, IN
- 2017 **LANL FIESTA Fission School & Workshop**
“Searching for New Highly r -Process-Enhanced Stars in the Halo of the Milky Way”
Sante Fe, NM
- 2016 **Graduate Physics Students (GPS) Fall Conference**
“A Bright r -II Star Detected by High-Resolution Follow-up of the RAVE Survey”
University of Notre Dame, Notre Dame, IN
- Nuclei in the Cosmos XIV**
“A Bright r -II Star Detected by High-Resolution Follow-up of the RAVE Survey”
Toki Messe, Niigata, Japan
- 2014 **American Astronomical Society Meeting #224**
“Identifying New Members of Nearby Moving Groups”
Westin Copley Place, Boston, MA

HONORS AND FELLOWSHIPS

- 2018 **Zahm Research Travel Grant**
Awarded amount: \$2,000
The Graduate School has dedicated the earnings from the Zahm Research Travel endowment to help support the professional development of graduate students.
- 2017 – **Eartly-Lennox Graduate Student Fellow, University of Notre Dame**
Awarded to support two Physics graduate students at Notre Dame.
- 2015 – **Arthur J. Schmitt Leadership Fellow, University of Notre Dame**
Notre Dame’s top graduate students in science and engineering are selected as Arthur J. Schmitt Leadership Fellows.

SKILLS

Python, IRAF, LaTeX
High-resolution spectroscopy
Shell scripting, C++

STUDENT SUPERVISION

- 2018 Phuong Hoang (REU), University of Hanoi
Tino Wells (REU), University of Washington

ACTIVITIES AND OUTREACH

- 2019 Lead Physics lab teaching assistant for the Moreau College Initiative at Westville Correctional Facility
- 2019 Co-organizer of the JINA-CEE First Frontiers Summer School
- 2017 – 2018 Graduate Student Union (GSU) Representative for the Department of Physics

- 2016* – Member of the Joint Institute for Nuclear Astrophysics - Center for the Evolution of the Elements (JINA-CEE)
- 2015* – Member of the Society of Schmitt Fellows
- 2016* Teaching Assistant for Sensing our World 2016: Mission to Mars
- 2016* Exhibitor for Our Universe Revealed: Hands-On Physics and Astroblast!
- 2016* Exhibitor for JINA-CEE Art 2 Science Camp