Erika M. Holmbeck

Arthur J. Schmitt Leadership Fellow
Department of Physics, University of Notre Dame
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Education

anticipated 2020 **University of Notre Dame**
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

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, arXiv:1904.02139, (ApJ, *submitted*).

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]* ~ -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.

Student supervision

2018 Phuong Hoang (REU), University of Hanoi

Tino Wells (REU), University of Washington

Activities and Outreach

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