ELIZABETH R. LOUDEN

Ph.D. Physics

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previously:
Elizabeth R. De Waard

Education

University of Notre Dame, Notre Dame, IN — Ph.D., May 2018
Concentration - Condensed Matter Physics

Lewis University, Romeoville, IL — B.S., May 2013
Distinguished Scholar's Diploma
Major - Physics, Minor - Mathematics

Honors, Awards, & Fellowships

Arthur J. Schmitt Presidential Fellowship — 2013-present
Zahm Research Travel Grant — March 2016 & March 2017
NSF Graduate Research Fellowship Program, Honorable Mention — March 2015
Notebaert Professional Development Travel Fund — March 2015
Lewis University Exceptional Physics Graduate — May 2013
Frank J. Lewis Scholarship — 2009 - 2012
Sister Noel Dreska Physics Scholarship — 2009 - 2012

Teaching Experience

Online College Teaching Institute (OCTI), University of Notre Dame — present

- Participant in the OCTI presented by the Kaneb Center for Teaching & Learning.
- OCTI is a 6-week online course designed to teach graduate students how to be effective online teachers.

Teaching Practicum, University of Notre Dame — 2017

- Planned and delivered 3, 1-hour long physics lectures.
    - Quantum Mechanics II: Fine Structure; ~10 students
    - General Physics II: Energy in Capacitors; ~100 students (delivered to 2 sections)
- Observed by physics faculty members and professionals from the Kaneb Center for Teaching & Learning.

Teaching Assistant, University of Notre Dame — 2013-2014

- General Physics Tutorials for Engineering Students (~20 students).
- Provided a brief review lecture of the material.
- Assisted students with physics tutorial problems.
- Graded assignments and maintained online course information through Sakai.

Teaching Assistant, Lewis University — 2012-2013

- Assisted students during General Physics I & II laboratories (~20 students).
- Graded lab reports and exams.

Tutor, Lewis University & University of Notre Dame — 2010-Present

- Tutored pre-medical, chemistry, and engineering students in both algebra- and calculus-based general physics for 8 years.

Service

Association for Women in Science (AWIS), University of Notre Dame — 2013-present

- 2017 - 2018 Physics Representative
- One of the lead organizers for the AWIS STEMentorship Program
  - STEMentorship matches female undergraduates interested in science with female graduate students
  - Helped recruit and match participants.
  - Maintained the social media platform.
  - Helped plan and run the opening "Meet & Greet" Event
  - Coordinated all workshop speakers for the duration of the program
- Lead organizer for the AWIS Science Alive Booth
  - Science Alive provides an interactive and fun science outreach event for children in the South Bend community.
  - Recruited, scheduled, and coordinated all AWIS volunteers.
  - Selected demos to fit with theme "Experiments You Can Do At Home!" and designed a "Physics of Energy" interactive exhibit.

Graduate Physics Society (GPS), University of Notre Dame — 2013-present

- 2014-2015 Executive Board Member - Condensed Matter Representative
- 2015-2016 Fundraising Committee Chair
- 2016-2017 Social Committee Chair
- One of the Lead Organizers for the 2016 GPS Annual Conference
  - Coordinated oral and poster presentations
  - Managed catering for the conference dinner

Society of Schmitt Fellows, University of Notre Dame — 2013-present

- 2016-2017 Executive Board Member - Secretary
- 2017 Society of Schmitt Fellows Travel Funds Reviewer
- 2015 Inaugural Pi Day 5K Organizer & Volunteer
- 2014 Graduate School Information Session Organizer & Panelist

Research Experience

Graduate Research Assistant, University of Notre Dame — 2013-Present
Professor Morten Eskildsen

Performed small-angle neutron scattering experiments to examine the unusual vortex lattice dynamics in MgB_2. These often involved designing new experimental procedures to push the limit of SANS. Developed new analysis suite in Matlab to automate, standardize, and accelerate current group analysis techniques.

Undergraduate Research Assistant, Lewis University — 2010-2013
Professor Joseph Kozminski

Using C++ and G4Beamline, performed Monte Carlo simulations of particle interactions for the design of a particle collider. Collaborated with Muons, inc. and Northern Illinois University.

Undergraduate Physics Consultant, Lewis University — 2012
Professor Chuck Crowder

Advised a group of aviation master's students on their thesis project. Based on a known aviation problem, formulated a method to quantify that problem and collected relevant data.

Research Experience for Undergraduates, Louisiana State University — 2010
Professor T. Gregory Guzik

Constructed a balloon-flight payload with three other students to differentiate between hydrogen and helium primary cosmic radiation. Individually responsible for the design and construction of the coincidence circuit to discriminate signal from noise.

Publications

E. R. Louden, C. Rastovski, L. DeBeer-Schmitt, C. D. Dewhurst, N. D. Zhigadlo, and M. R. Eskildsen, "*A dichotomy in the metastable to equilibrium vortex lattice transition in MgB2*," *submitted*

M. P. Smylie, H. Claus, W.-K. Kwow, **E. R. Louden**, M. R. Eskildsen, A. S. Sefat, R. D. Zhong, J. Schneeloch, G. D Gui, E. Bokari, P. M. Niraula, A. Kayani, C. D. Dewhurst, A. Snezhko, and U. Welp, "*Superconductivity, pairing symmetry, and disorder in the doped topological insulator* $Sn_{1-x}In_xTe$ *for* $x \geq 0.10$," Physical Review B, **97**, 024511 (19 January 2018).

S. J. Kuhn, W. Morgenlander, **E. R. Louden**, C. Rastovski, W. J. Gannon, H. Takatsu, D. C. Peets, Y. Maeno, C. D. Dewhurst, J. Gavilano, and M. R. Eskildsen, "*Anisotropy and multiband superconductivity in* Sr_2RuO_4 *determined by small-angle neutron scattering studies of the vortex lattice,*" Physical Review B, **96**, 174507 (14 November 2017).

M. Marziali Bermúdez, **E. R. Louden**, M. R. Eskildsen, C. D. Dewhurst, V. Bekeris, and G. Pasquini, "*Metastability and hysteretic vortex pinning near the order-disorder transition in* $NbSe_2$*: Interplay between plastic and elastic energy barriers*," Physical Review B, **95**, 104505 (6 March 2017).

R. J. Demik, S. Harriman, R. S. Phillips, C. Crowder, J. A. Pfeifer, S. F. McHugh, S. J. Foster, **E. R. De Waard**, M. Streit, R. B. Antoniolli, E. W. Knight, D. S. York, and J. Luedtke, "*Measuring Intensity of Laser Light Penetrating Flight Decks in Laser Illuminations*," Journal of Aviation Technology and Engineering, Vol. **3**, Iss. 1, Article 2 (2013).

Selected Presentations

E. R. De Waard, S. Manni, P. C. Canfield, J. Barker, C. D. Dewhurst, M. R. Eskildsen, "*Tuning the Phase Diagram of* MgB_2 *through Magnetic and Non-magnetic Doping*," American Physical Society March Meeting, *New Orleans, LA* (March 2017).

E. R. De Waard, "*What can we learn from SANS studies of superconducting vortices?*" Dr. Leonard Wiesenthal Colloquium Series, *Lewis University, IL* (October 2016).

E. R. De Waard, S. J. Kuhn, C. Rastovski, M. R. Eskildsen, A. Leishman, C. D. Dewhurst, L. DeBeer-Schmitt, K. Littrell, J. Karpinski, N. D. Zhigadlo, "*Dynamic and Structural Studies of Metastable Vortex Lattice Domains in* MgB_2*,*" American Physical Society March Meeting, *Baltimore, MD* (March 2016).

E. R. De Waard, S. J. Kuhn, C. Rastovski, M. R. Eskildsen, A. Leishman, C. D. Dewhurst, L. DeBeer-Schmitt, K. Littrell, J. Karpinski, N. D. Zhigadlo, "*Structural Studies of Metastable and Ground State*

Vortex Lattice Domains in MgB_2," American Physical Society March Meeting, *San Antonio, TX* (March 2015).

E. R. De Waard, S. J. Kuhn, C. Rastovski, M. R. Eskildsen, A. Leishman, C. D. Dewhurst, L. DeBeer-Schmitt, K. Littrell, J. Karpinski, N. D. Zhigadlo, "Structural Studies of Metastable and Ground State Vortex Lattice Domains in MgB_2," American Physical Society Fall Meeting, Prairie Section, *University of Notre Dame, IN* (November 2015).

E. R. De Waard, M. Szubert, J. Kozminski, "*Examining the Safety of Airport Backscatter X-Ray Scanners Using G4Beamline,*" Celebration of Scholarship, *Lewis University, IL* (April 2013).

E. R. De Waard, M. Ziebinski, C. Crowder, J. Kozminski, "Measuring the Transverse Trapping Field Strength of Optical Tweezers," Celebration of Scholarship, *Lewis University, IL* (April 2012).

E. R. De Waard, M. Ziebinski, C. Crowder, J. Kozminski, "*Measuring the Transverse Trapping Field Strength of Optical Tweezers,*" American Association of Physics Teachers Chicago Section Meeting, *Harvey, IL* (April 2012).

E. R. De Waard, J. Kozminski, "Examining Particle Interactions for Detector Shielding using G4Beamline," American Chemical Society Joliet Section, *Joliet, IL* (November 2011).

E. R. De Waard, J. Kozminski, "*Examining Particle Interactions for Detector Shielding using G4Beamline*," Summer Undergraduate Research Experience Symposium, *Lewis University, IL* (August 2011).

E. R. De Waard, J. Kozminski, "*Muon Colliders: A Feasibility Study Examining Detector Backgrounds with G4Beamline,*" Honors Council of the Illinois Region Conference, *Lewis University, IL* (February 2011).

E. R. De Waard, K. Tillman, L. Wiesenthal, "Electrostatics: Examining a Charged Particle in an Imperfect Physical Dipole Field," Associated Colleges of the Chicago Area Conference, *Lewis University, IL* (April 2010).