

# Kelsey Lund, PhD

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## APPOINTMENTS

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<b>N3AS Postdoctoral Fellow</b> Network for Neutrinos, Nuclear Astrophysics, and Symmetries UC Berkeley / Institute for Nuclear Theory	2024 - Present Seattle, WA
<b>Graduate Research Fellow</b> Center for Nonlinear Studies Los Alamos National Laboratory	2020 - 2024 Los Alamos, NM
<b>Graduate Research Assistant</b> Department of Physics North Carolina State University	2020-2024 Raleigh, NC

## EDUCATION

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<b>PhD Physics</b> North Carolina State University Dissertation Title: <b>How the Gentle Winds Beckon: r-Process Nucleosynthesis in Neutron Star Merger Winds</b>	2024 Raleigh, NC
<b>MS Physics</b> North Carolina State University	2020 Raleigh, NC
<b>BS Physics</b> University of California San Diego	2017 La Jolla, CA

## PUBLICATIONS

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<b>Gamma Rays as a Signature of r-Process Producing Supernovae: Remnants and Future Galactic Explosions</b> Z. Liu, E. Grohs, <b>K.A. Lund</b> , G. C. McLaughlin, M. Reichert, I.U. Roederer, R. Surman, X. Wang arXiv:2506.14991 ( <i>Accepted to The Astrophysical Journal</i> )	2025
<b>Angle-Dependent in-situ Fast Flavor Transformations in Post-Neutron Star Merger Disks</b> <b>K.A. Lund</b> , P. Mukhopadhyay, J.M. Miller, G.C. McLaughlin Astrophysical Journal Letters, 985, L9	2025
<b>Kilonova Emissions from Neutron Star Merger Remnants: Implications for Nuclear Equation of State</b> <b>K.A. Lund</b> , R. Somasundaram, G.C. McLaughlin, J.M. Miller, M.R. Mumpower, I. Tews The Astrophysical Journal, 987, 56	2025
<b>Nuclear Uncertainties Associated with the Ejecta of a Neutron-Star Black-Hole Accretion Disk</b> M.R. Mumpower, T.M. Sprouse, J.M. Miller, <b>K.A. Lund</b> , J.C. Garcia, N. Vassh, G.C. McLaughlin, R. Surman The Astrophysical Journal, 970, 173	2024
<b>Magnetic Field Strength Effects on Nucleosynthesis from Neutron Star Merger Outflows</b> <b>K.A. Lund</b> , G.C. McLaughlin, J.M. Miller, M.R. Mumpower The Astrophysical Journal, 964, 111	2024
<b>Emergent Nucleosynthesis from a 1.2 Second Long Simulation of a Black-Hole Accretion Disk</b> T.M. Sprouse, <b>K.A. Lund</b> , J.M. Miller, G.C. McLaughlin, M.R. Mumpower The Astrophysical Journal, 962, 79	2024
<b>Superheavy Elements in Kilonovae</b> E.M. Holmbeck, J. Barnes, <b>K.A. Lund</b> , T.M. Sprouse, G.C. McLaughlin, M.R. Mumpower Astrophysical Journal Letters, 951, L13	2023
<b>The Influence of <math>\beta</math> Decay Rates on r-Process Observables</b> <b>K.A. Lund</b> , J. Engel, G.C. McLaughlin, M.R. Mumpower, E.M. Ney, R. Surman The Astrophysical Journal, 944, 144	2023
<b>Kilonovae Across the Nuclear Physics Landscape: the Impact of Nuclear Physics Uncertainties on r-Process Powered Emission</b> J. Barnes, Y.L. Zhu, <b>K.A. Lund</b> , T.M. Sprouse, N. Vassh, G.C. McLaughlin, M.R. Mumpower, R. Surman The Astrophysical Journal, 918, 44	2021
<b>Modeling Kilonova Light Curves: Dependence on Nuclear Physics Inputs</b> Y.L. Zhu, <b>K.A. Lund</b> , J. Barnes, T.M. Sprouse, N. Vassh, G.C. McLaughlin, M.R. Mumpower, R. Surman The Astrophysical Journal, 906, 94	2021

## INVITED TALKS

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### INVITED SEMINARS

<i>Upcoming: NYU Astrophysics Seminar</i> ( <a href="#">New York, NY</a> )	Apr 2026
<b>GTSI Nuclear Science &amp; SSI Seminar</b> ( <a href="#">Livermore, CA</a> )	Jul 2025
“Colors of the Winds: Painting a Picture of Neutron Star Merger Disks”	
<b>University of Tennessee, Knoxville Physics &amp; Astrophysics Seminar</b> ( <a href="#">virtual</a> )	Apr 2025
“Post-Neutron Star Merger Accretion Disk Winds: A Flavor Sampler”	
<b>IReNA Online Seminar</b> ( <a href="#">virtual</a> )	Feb 2025
“Nucleosynthesis in Neutron Star Merger Remnant Winds”	
<b>Notre Dame Astrophysics Seminar</b> ( <a href="#">South Bend, IN</a> )	Oct 2024
“How the Gentle Winds Beckon: Nucleosynthesis in Neutron Star Merger Winds”	
<b>Los Alamos National Laboratory T-2 Distinguished Seminar Series</b> ( <a href="#">Los Alamos, NM</a> )	Jul 2024
“How the Gentle Winds Beckon: r-Process Nucleosynthesis in Neutron Star Merger Winds”	
<b>Caltech Astronomy Tea Talk</b> ( <a href="#">Pasadena, CA</a> )	Jan 2024
“Magnetic Field Effects on r-Process Nucleosynthesis in Post-Merger Disk Outflows”	
<b>University of Minnesota Nuclear Theory Seminar</b> ( <a href="#">virtual</a> )	Oct 2023
“To The Actinides and Beyond: Nucleosynthesis in Neutron Star Merger Disks”	
<b>Virginia Tech Astronomy Seminar</b> ( <a href="#">Blacksburg, VA</a> )	Apr 2023
“Uncertainties and Opportunities in r-Process Observables”	
<b>N3AS Seminar</b> ( <a href="#">virtual</a> )	Aug 2022
“Effects of Nuclear Uncertainties on r-Process Observables”	
<b>Los Alamos National Laboratory T-2 Distinguished Seminar Series</b> ( <a href="#">Los Alamos, NM</a> )	Jul 2022
“Probing Sources of Uncertainty in Kilonova Modeling”	

### INVITED CONFERENCES & WORKSHOPS

<i>Upcoming: APS Global Physics Summit</i> ( <a href="#">Denver, CO</a> )	Mar 2026
<i>Upcoming: Physics and Astrophysics of Neutrino-Dense Environments Workshop</i> ( <a href="#">Aspen, CO</a> )	Jan 2026
<b>APS Division of Nuclear Physics Meeting</b> ( <a href="#">Chicago, IL</a> )	Oct 2025
“Nuclear Uncertainties in r-Process Heavy Element Formation and Kilonova Modeling”	
<b>INT Program 25-2b: From Colliders to the Cosmos</b> ( <a href="#">Seattle, WA</a> )	Sep 2025
“Interpreting Kilonova Signals to Constrain the Nuclear Equation of State”	
<b>FRIB-TA Topical Program: Future Directions in Nuclear Beta Decay at FRIB</b> ( <a href="#">East Lansing, MI</a> )	Sep 2025
“ $\beta$ -Decay Rates and Their Influence on Astrophysical r-Process Observables”	
<b>SFB 1245 Annual Workshop</b> ( <a href="#">Leiman, Germany</a> )	Nov 2024
“Nucleosynthesis and Neutron Star Mergers”	
<b>BRIDGCE-IReNA 2024 Annual Meeting</b> ( <a href="#">Guildford, UK</a> )	Jul 2024
“Magnetic Field Strength Effects on Nucleosynthesis from Neutron Star Merger Outflows”	
<b>ECT* Workshop: MICRA (Microphysics in Computational Relativistic Astrophysics)</b> ( <a href="#">Trento, Italy</a> )	Sep 2023
“Magnetic Field Effects on Nucleosynthesis in Post-Merger Disk Outflows”	
<b>INT Program 23-2: Astrophysical Neutrinos and the Origin of the Elements</b> ( <a href="#">Seattle, WA</a> )	Aug 2023
“A “Beta” Look at Post-merger Nucleosynthesis”	
<b>Remnants of Neutron-Star Mergers: Connecting Hydrodynamics Models to Nuclear, Neutrino, and Kilonova Physics</b> ( <a href="#">Darmstadt, Germany</a> )	Oct 2022
“Key Uncertainties in Astrophysical r-process Nucleosynthesis”	
<b>INT Prog. 21-3: Radionuclides: Nuclear Physics, Astrophysical Models, and Observations</b> ( <a href="#">virtual</a> )	Oct 2021
“Nuclear Physics in Kilonova Modeling”	

### LECTURES

<b>INTURN Lecture Series</b> ( <a href="#">Seattle, WA</a> )	Nov 2025
“Using Design to Communicate Physics Results”	
<b>INTURN Lecture Series</b> ( <a href="#">Seattle, WA</a> )	Apr 2025
“Introduction to Nucleosynthesis in the Universe”	
<b>North Carolina State University Nuclear Astrophysics Group</b> ( <a href="#">Raleigh, NC</a> )	Jan 2022
“matplotlib Tutorial for Nuclear Astrophysics”	
<b>Universitat Politècnica de Barcelona</b> ( <a href="#">Barcelona, Spain</a> )	Oct 2021
“Nucleosynthesis in the Universe”	

## OTHER TALKS

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### CONTRIBUTED TALKS

<b>International Symposium on Nuclei in the Cosmos XVIII</b> ( <a href="#">Barcelona, Spain</a> ) “Neutrino Oscillations in Post-Merger Disks”	Jun 2025
<b>APS Division of Nuclear Physics Meetings</b> ( <a href="#">Boston, MA</a> ) “r-Process Nucleosynthesis from Neutron Star Merger Winds	Oct 2024
<b>Los Alamos T-Division Student Lightning Talks</b> ( <a href="#">Los Alamos, NM</a> ) “Magnetic Field Strength Effects on Nucleosynthesis in Merger Driven Outflows	Jul 2023
<b>International School of Nuclear Physics, 43rd Course</b> ( <a href="#">Erice, Italy</a> ) “Kilonova Modeling: Nuclear Physics, Magnetic Fields, Neutrinos	Sep 2022
<b>Los Alamos T-Division Student Lightning Talks</b> ( <a href="#">Los Alamos, NM</a> ) “Magnetic Fields in Kilonova Modeling” <b>Awarded 1<sup>st</sup> Place prize</b>	Aug 2022
<b>N3AS Summer School in Multi-Messenger Astrophysics</b> ( <a href="#">Santa Cruz, CA</a> ) “Kilonova Modeling”	Aug 2022
<b>15<sup>th</sup> International Conference on Nuclear Data for Science and Technology</b> ( <a href="#">virtual</a> ) “Probing Nuclear Uncertainties in Kilonova Modeling”	Jul 2022
<b>Center for Nonlinear Studies Student Series</b> ( <a href="#">Los Alamos, NM</a> ) “Kilonova Modeling: Magnetic Fields, Neutrinos, Nuclear Physics”	Jul 2022
<b>ChETEC-INFRA Schools on Nuclear Astrophysics Questions</b> ( <a href="#">virtual</a> ) “Actinide Dating Stars: Nuclear Uncertainties in Cosmic Age	Jan 2022
<b>ECT* Workshop: KRINA (Key Reactions in Nuclear Astrophysics)</b> ( <a href="#">virtual</a> ) “Sensitivity of the Observed Kilonova Signal to Nuclear Physics”	Jun 2021
<b>Southeast Section APS (SESAPS) Meeting</b> ( <a href="#">virtual</a> ) “Identification of Key Isotopes in Kilonova Heating”	Nov 2020
<b>APS Division of Nuclear Physics Meeting</b> ( <a href="#">virtual</a> ) “Identification of Key Isotopes in Kilonova Heating”	Nov 2020
<b>FIRE Collaboration Annual Meeting</b> ( <a href="#">virtual</a> ) “Identification of Key r-Process Isotopes in Kilonova Heating”	Jul 2020
<b>APS Division of Nuclear Physics Meetings</b> ( <a href="#">Crystal City, VA</a> ) “Uncertainties in Kilonova Heating from Nuclear Physics Inputs”	Oct 2019
<b>FIRE Collaboration Annual Meeting</b> ( <a href="#">Upton, NY</a> ) “Uncertainties in Kilonova Light Curves from Nuclear Physics: A Case Study”	Jun 2019
<b>NRAO Seminar Series</b> ( <a href="#">Socorro, NM</a> ) “Probing Magnetized Turbulence in the Fermi Bubbles”	2016
<b>APS Pacific Coast Gravity Meeting</b> ( <a href="#">Fullerton, CA</a> ) “On The Astrophysical Origin of the Elements”	2016

### POSTERS

<b>RIKEN iTHEMS NOW&amp;NEXT25</b> ( <a href="#">Wakō, Japan</a> ) “Neutrino Fast Flavor Oscillations in Neutron Star Merger Disks”	Jul 2025
<b>Neutrinos in Physics and Astrophysics</b> ( <a href="#">Berkeley, CA</a> ) “r-Process Nucleosynthesis from Post-Merger Disks with Monte Carlo Neutrino Transport: Effects of Magnetic Field Strength”	Jan 2025
<b>International Symposium on Nuclei in the Cosmos XVII</b> ( <a href="#">Daejeon, Korea</a> ) “Magnetic Field Effects on Nucleosynthesis from Merger Outflows” <b>Awarded prize for Outstanding Poster Presentation</b>	Sep 2023
<b>JINA Frontiers in Nuclear Astrophysics Meeting</b> ( <a href="#">South Bend, IN</a> ) “Actinide-Dating Stars: Nuclear Uncertainties in Cosmic Age”	May 2022
<b>North Carolina State University Graduate Student Research Symposium</b> ( <a href="#">Raleigh, NC</a> ) “Actinide-Dating Stars: Nuclear Uncertainties in Cosmic Age”	Apr 2022
<b>AAS Winter Meeting</b> ( <a href="#">Grapevine, TX</a> ) “Probing Magnetized Turbulence in the Fermi Bubbles”	Jan 2017
<b>NAC IV Workshop</b> ( <a href="#">Washington, DC</a> ) “Probing Magnetized Turbulence in the Fermi Bubbles”	Oct 2016

## MENTORSHIP

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### University of Washington / Institute for Nuclear Theory:

Part of leadership team for INT Undergraduate Research Network (INTURN)  
Current research mentor for **one undergraduate student** through INTURN

### UC Berkeley:

Current research mentor for **one undergraduate student** through N3AS  
Current career mentor for **two undergraduate students** through N3AS

### Other:

Ongoing mentorship and research assistance provided to graduate students at various institutions

## OTHER ACADEMIC ACTIVITIES

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### 2025

#### *Community Work:*

- University of Washington Physics Postdoc Professional Development Committee Member (*ongoing*)
- Rising Researchers Seminar Series Core Committee member (*ongoing*)
- Organizer for N3AS Seminar Series (*ongoing*)
- Panelist at Time Domain and Multi-Messenger Astrophysics (TDAMM) IV Workshop (*Oct 2025*)
- Organizing Committee CeNAM Frontiers 2026 (*upcoming in College Station, TX*)
- Local Organizing Committee for International Symposium on Nuclei in the Cosmos (*until Jun 2025*)

#### *Workshops & Schools:*

- Nuclei in the Cosmos School ([Barcelona, Spain](#))
- CeNAM/INT Nucleosynthesis Uncertainties Workshop ([Seattle, WA](#))

### 2024

- INT Workshop 24-89W: EOS Measurements with Next-Generation Gravitational-Wave Detectors ([Seattle, WA](#))

### 2022

- N3AS Summer School in Multi-Messenger Astrophysics ([Santa Cruz, CA](#))
- JINA-CEE Frontiers in Nuclear Astrophysics Meeting ([South Bend, IN](#))

### 2021

- INT Workshop 21-79W: New Directions in Neutrino Flavor Evolution in Astrophysical Systems ([virtual](#))
- International Neutrino Summer School ([virtual](#))
- ECT\* Workshop: Probing Nuclear Physics with Neutron Star Mergers ([virtual](#))
- International Workshop on Weak Interactions and Neutrinos ([virtual](#))

### 2020

- JINA-Horizons Workshop ([virtual](#))

### 2019

- ECT\* Workshop: Nuclear and Astrophysics Aspects for the Rapid Neutron Capture Process in the Era of Multi-Messenger Observations ([Trento, Italy](#))
- FOE19 Fifty-one Erg Conference ([Raleigh, NC](#))
- JINA First Frontiers Summer School ([East Lansing, MI](#))

### 2018

- Neutron Physics Summer School ([Raleigh, NC](#))

## OUTREACH

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<i>Upcoming Astronomy on Tap</i> public talk ( <a href="#">Seattle, WA</a> )	Nov 2025
<b>Astronomy Days</b> at North Carolina Museum of Natural Sciences ( <a href="#">Raleigh, NC</a> )	Jan 2023
<b>Astronomy on Tap</b> public Talk ( <a href="#">Durham, NC</a> )	Nov 2022
<b>Astronomy Days</b> at North Carolina Museum of Natural Sciences ( <a href="#">Raleigh, NC</a> )	Jan 2022
<b>LEAP Workshop</b> at North Carolina State University ( <a href="#">Raleigh, NC</a> )	Aug 2018
Designed plan for <b>Galaxy Garden</b> at VLA visitor center ( <a href="#">Magdalena, NM</a> )	Jul 2017
<b>Restored 2-dish interferometer</b> at Frank T. Etschorn Observatory ( <a href="#">Socorro, NM</a> )	Jul 2017
<b>Public Tours</b> of Very Large Array (VLA) facilities ( <a href="#">Magdalena, NM</a> )	Jul 2016

## LANGUAGES

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**Native Proficiency:** English, Catalan, Spanish

**Working Proficiency:** Italian

**Elementary Proficiency:** French, German

**Computational:** Python, HPC and large-scale simulations, Mathematica, Data Visualization, Data analysis

## SELECTED REFERENCES

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**Gail McLaughlin**

Professor

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