

Kelsey Lund, PhD

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APPOINTMENTS

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

EDUCATION

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

PUBLICATIONS

Gamma Rays as a Signature of r-Process Producing Supernovae: Remnants and Future Galactic Explosions Z. Liu, E. Grohs, K.A. Lund , G. C. McLaughlin, M. Reichert, I.U. Roederer, R. Surman, X. Wang The Astrophysical Journal, 995, 1	2025
Angle-Dependent in-situ Fast Flavor Transformations in Post-Neutron Star Merger Disks K.A. Lund , P. Mukhopadhyay, J.M. Miller, G.C. McLaughlin Astrophysical Journal Letters, 985, L9	2025
Kilonova Emissions from Neutron Star Merger Remnants: Implications for Nuclear Equation of State K.A. Lund , R. Somasundaram, G.C. McLaughlin, J.M. Miller, M.R. Mumpower, I. Tews The Astrophysical Journal, 987, 56	2025
Nuclear Uncertainties Associated with the Ejecta of a Neutron-Star Black-Hole Accretion Disk M.R. Mumpower, T.M. Sprouse, J.M. Miller, K.A. Lund , J.C. Garcia, N. Vassh, G.C. McLaughlin, R. Surman The Astrophysical Journal, 970, 173	2024
Magnetic Field Strength Effects on Nucleosynthesis from Neutron Star Merger Outflows K.A. Lund , G.C. McLaughlin, J.M. Miller, M.R. Mumpower The Astrophysical Journal, 964, 111	2024
Emergent Nucleosynthesis from a 1.2 Second Long Simulation of a Black-Hole Accretion Disk T.M. Sprouse, K.A. Lund , J.M. Miller, G.C. McLaughlin, M.R. Mumpower The Astrophysical Journal, 962, 79	2024
Superheavy Elements in Kilonovae E.M. Holmbeck, J. Barnes, K.A. Lund , T.M. Sprouse, G.C. McLaughlin, M.R. Mumpower Astrophysical Journal Letters, 951, L13	2023
The Influence of β Decay Rates on r-Process Observables K.A. Lund , J. Engel, G.C. McLaughlin, M.R. Mumpower, E.M. Ney, R. Surman The Astrophysical Journal, 944, 144	2023
Kilonovae Across the Nuclear Physics Landscape: The Impact of Nuclear Physics Uncertainties on r-Process Powered Emission J. Barnes, Y.L. Zhu, K.A. Lund , T.M. Sprouse, N. Vassh, G.C. McLaughlin, M.R. Mumpower, R. Surman The Astrophysical Journal, 918, 44	2021
Modeling Kilonova Light Curves: Dependence on Nuclear Physics Inputs Y.L. Zhu, K.A. Lund , J. Barnes, T.M. Sprouse, N. Vassh, G.C. McLaughlin, M.R. Mumpower, R. Surman The Astrophysical Journal, 906, 94	2021

INVITED TALKS

INVITED SEMINARS

GTSI Nuclear Science & SSI Seminar (Livermore, CA)	Jul 2025
“Colors of the Winds: Painting a Picture of Neutron Star Merger Disks”	
University of Tennessee, Knoxville Physics & Astrophysics Seminar (virtual)	Apr 2025
“Post-Neutron Star Merger Accretion Disk Winds: A Flavor Sampler”	
IReNA Online Seminar (virtual)	Feb 2025
“Nucleosynthesis in Neutron Star Merger Remnant Winds”	
Institute for Nuclear Theory Brownbag Seminar (Seattle, WA)	Jan 2025
“On Merger Remnants and Heavy Element Formation”	
Notre Dame Astrophysics Seminar (South Bend, IN)	Oct 2024
“How the Gentle Winds Beckon: Nucleosynthesis in Neutron Star Merger Winds”	
Los Alamos National Laboratory T-2 Distinguished Seminar Series (Los Alamos, NM)	Jul 2024
“How the Gentle Winds Beckon: r-Process Nucleosynthesis in Neutron Star Merger Winds”	
Caltech Astronomy Tea Talk (Pasadena, CA)	Jan 2024
“Magnetic Field Effects on r-Process Nucleosynthesis in Post-Merger Disk Outflows”	
University of Minnesota Nuclear Theory Seminar (virtual)	Oct 2023
“To The Actinides and Beyond: Nucleosynthesis in Neutron Star Merger Disks”	
Virginia Tech Astronomy Seminar (Blacksburg, VA)	Apr 2023
“Uncertainties and Opportunities in r-Process Observables”	
N3AS Seminar (virtual)	Aug 2022
“Effects of Nuclear Uncertainties on r-Process Observables”	
Los Alamos National Laboratory T-2 Distinguished Seminar Series (Los Alamos, NM)	Jul 2022
“Probing Sources of Uncertainty in Kilonova Modeling”	

INVITED CONFERENCES & WORKSHOPS

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

LECTURES

INTURN Lecture Series (Seattle, WA)	Apr 2025
“Introduction to Nucleosynthesis in the Universe”	
North Carolina State University Nuclear Astrophysics Group (Raleigh, NC)	Jan 2022
“matplotlib Tutorial for Nuclear Astrophysics”	
Universitat Politècnica de Barcelona (Barcelona, Spain)	Oct 2021
“Nucleosynthesis in the Universe”	

OTHER TALKS

CONTRIBUTED TALKS

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

POSTERS

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

MENTORSHIP

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 **one undergraduate student** through N3AS

Other:

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

OTHER ACADEMIC ACTIVITIES

2025-2026

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

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

LANGUAGES

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

Gail McLaughlin

Professor

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