

Kelsey Lund

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EXPERIENCE

2024 - Present **UC Berkeley / Institute for Nuclear Theory** *N3AS Postdoctoral Fellow*, Seattle, WA
2020 - 2024 **Los Alamos National Laboratory** *Graduate Research Assistant*, Los Alamos, NM
2018 - 2024 **North Carolina State University** *Graduate Research Assistant*, Raleigh, NC

EDUCATION

2024 **Ph.D. Physics** North Carolina State University, Raleigh, NC
 Dissertation Title “*How the Gentle Winds Beckon: r-Process Nucleosynthesis in Neutron Star Merger Winds*”
2020 **M.S. Physics** North Carolina State University, Raleigh, NC
2017 **B.S. Physics** University of California San Diego, La Jolla, CA

PUBLICATIONS

Z. Liu, E. Grohs, **K.A. Lund** et al. “Gamma Rays as a Signature of r-Process Producing Supernovae: Remnants and Future Galactic Explosions”, *arXiv:2506.14991* (2025)
K.A. Lund, P. Mukhopdhyay et al. “Angle-Dependent in-situ Fast Flavor Transformations in Post-Neutron Star Merger Disks”, *ApJL*, 985, L9 (2025)
K.A. Lund, R. Somasundaram et al. “Kilonova Emissions from Neutron Star Merger Remnants: Implications for Nuclear Equation of State”, *arXiv:2408.07686* (2024)
M.R. Mumpower, T.M. Sprouse, J.M. Miller, **K.A. Lund** et al. “Nuclear Uncertainties Associated with the Ejecta of a Neutron-Star Black-Hole Accretion Disk”, *ApJ*, 970, 173 (2024)
K.A. Lund, G.C. McLaughlin et al. “Magnetic Field Strength Effects on Nucleosynthesis from Neutron Star Merger Outflows”, *ApJ*, 964, 111 (2024)
T.M. Sprouse, **K.A. Lund** et al. “Emergent Nucleosynthesis from a 1.2 Second Long Simulation of a Black-Hole Accretion Disk”, *ApJ* 962, 79 (2024)
E.M. Holmbeck, J. Barnes, **K.A. Lund**, et al. “Superheavy Elements in Kilonovae”, *ApJL* 951, L13 (2023)
K.A. Lund, J. Engel et al. “The Influence of Beta Decay Rates on r-Process Observables”, *ApJ* 944, 144 (2023)
J. Barnes, Y.L. Zhu, **K.A. Lund**, et al. “Kilonovae Across the Nuclear Physics Landscape: the Impact of Nuclear Physics Uncertainties on r-Process Powered Emission”, *ApJ* 918, 44 (2021)
Y.L. Zhu, **K.A. Lund** et al. “Modeling Kilonova Light Curves: Dependence on Nuclear Physics Inputs” *ApJ* 906, 94 (2021)

TALKS

Invited Talks

2025 Jul **GTSI Nuclear Science & SSI Seminar**
 “Colors of the Winds: Painting a Picture of Neutron Star Merger Disks” (Livermore, CA)
2025 Apr **UTK Physics & Astrophysics Seminar**
 “Post-Neutron Star Merger Accretion Disk Winds: A Flavor Sampler” (virtual)
2025 Feb **IReNA Online Seminar**
 “Nucleosynthesis in Neutron Star Merger Remnant Winds” (virtual)
2024 Nov **SFB 1245 Annual Workshop**
 “Nucleosynthesis and Neutron Star Mergers” (Leiman, Germany)
2024 Oct **Notre Dame Astrophysics Seminar**
 “How the Gentle Winds Beckon: Nucleosynthesis in Neutron Star Merger Winds” (South Bend, IN)
2024 Jul **Los Alamos National Laboratory T-2 Seminar**
 “How the Gentle Winds Beckon: r-Process Nucleosynthesis in Neutron Star Merger Winds” (Los Alamos, NM)
 BRIDGCE-IReNA 2024
 “Magnetic Field Strength Effects on Nucleosynthesis from Neutron Star Merger Outflows” (Guildford, UK)
2024 Jan **Caltech Astronomy Tea Talk**
 “Magnetic Field Effects on r-Process Nucleosynthesis in Post-Merger Disk Outflows” (Pasadena, CA)
2023 Oct **University of Minnesota Nuclear Theory Seminar**
 “To The Actinides and Beyond: Nucleosynthesis in Neutron Star Merger Disks” (virtual)
2023 Sep **ECT* Workshop: MICRA (Microphysics in Computational Relativistic Astrophysics)**
 “Magnetic Field Effects on Nucleosynthesis in Post-Merger Disk Outflows” (Trento, Italy)

- 2023 Aug **INT Program 23-2: Astrophysical Neutrinos and the Origin of the Elements**
"A "Beta" Look at Post-merger Nucleosynthesis" ([Seattle, WA](#))
- 2023 Apr **Virginia Tech Astronomy Seminar**
Uncertainties and Opportunities in r-Process Observables ([Blacksburg, VA](#))
- 2022 Oct **Remnants of Neutron-Star Mergers: Connecting Hydrodynamics Models to Nuclear, Neutrino, and Kilonova Physics**
Key Uncertainties in Astrophysical r-process Nucleosynthesis ([Darmstadt, Germany](#))
- 2022 Aug **N3AS Seminar**
"Effects of Nuclear Uncertainties on r-Process Observables" ([virtual](#))
- Los Alamos National Laboratory T-Division Seminar**
"Probing Sources of Uncertainty in Kilonova Modeling" ([Los Alamos, NM](#))
- 2021 Oct **Universitat Politècnica de Barcelona**
"Nucleosynthesis in the Universe" ([Barcelona, Spain](#))
- INT Program 21-3- Radionuclides: Nuclear Physics, Astrophysical Models, and Observations**
"Nuclear Physics in Kilonova Modeling" ([virtual](#))

Contributed Talks

- 2025 Jun **International Symposium on Nuclei in the Cosmos XVIII**
Neutrino Oscillations in Post-Merger Disks ([Girona, Spain](#))
- 2024 Oct **APS Division of Nuclear Physics Meeting**
r-Process Nucleosynthesis from Neutron Star Merger Winds ([Boston, MA](#))
- 2023 Jul **T-Division Student Lightning Talks**
Magnetic Field Strength Effects on Nucleosynthesis in Merger Driven Outflows ([Los Alamos, NM](#))
- 2022 Sep **International School of Nuclear Physics, 43rd Course**
Kilonova Modeling: Nuclear Physics, Magnetic Fields, Neutrinos ([Erice, Sicily](#))
- 2022 Aug **T-Division Student Lightning Talks**
Magnetic Fields in Kilonova Modeling ([Los Alamos, NM](#))
Awarded 1st Place prize
N3AS Summer School in Multi-Messenger Astrophysics
Kilonova Modeling ([Santa Cruz, CA](#))
- 2022 Jul **15th International Conference on Nuclear Data for Science and Technology**
Probing Nuclear Uncertainties in Kilonova Modeling ([virtual](#))
Center for Nonlinear Studies Student Series
Kilonova Modeling: Magnetic Fields, Neutrinos, Nuclear Physics ([Los Alamos, NM](#))
- 2022 Jan **ChETEC-INFRA Schools on Nuclear Astrophysics Questions**
Actinide Dating Stars: Nuclear Uncertainties in Cosmic Age ([virtual](#))
- 2021 Jun **ECT* Workshop: KRINA (Key Reactions in Nuclear Astrophysics)**
Sensitivity of the Observed Kilonova Signal to Nuclear Physics ([virtual](#))
- 2020 Nov **SESAPS Meeting**
Identification of Key Isotopes in Kilonova Heating ([virtual](#))
APS Division of Nuclear Physics Meeting
Identification of Key Isotopes in Kilonova Heating ([virtual](#))
- 2020 Jul **FIRE Collaboration Annual Meeting**
Identification of Key r-Process Isotopes in Kilonova Heating ([virtual](#))
- 2019 Oct **APS Division of Nuclear Physics Meeting**
Uncertainties in Kilonova Heating from Nuclear Physics Inputs ([Crystal City, VA](#))
- 2019 Jun **FIRE Collaboration Annual Meeting**
Uncertainties in Kilonova Light Curves from Nuclear Physics: A Case Study ([Upton, NY](#))
- 2016 **NRAO Seminar Series**
Probing Magnetized Turbulence in the Fermi Bubbles ([Socorro, NM](#))
APS Pacific Coast Gravity Meeting
On The Astrophysical Origin of the Elements ([Fullerton, CA](#))
- 2014 **Honors Transfer Council of California Research Conference**
Quantum Relativistic Effects on Inorganic Matter ([Irvine, CA](#))

Posters

- 2025 Jan **Neutrinos in Physics and Astrophysics**
r-Process Nucleosynthesis from Post-Merger Disks with Monte Carlo Neutrino Transport: Effects of Magnetic Field Strength ([Berkeley, CA](#))
- 2023 Sep **International Symposium on Nuclei in the Cosmos XVII**
Magnetic Field Effects on Nucleosynthesis from Merger Outflows ([Daejeon, Korea](#))

Awarded prize for Outstanding Poster Presentation

- 2022 May **JINA Frontiers in Nuclear Astrophysics Meeting**
Actinide-Dating Stars: Nuclear Uncertainties in Cosmic Age ([South Bend, IN](#))
- 2022 Apr **North Carolina State University Graduate Student Research Symposium**
Actinide-Dating Stars: Nuclear Uncertainties in Cosmic Age ([Raleigh, NC](#))
- 2017 Jan **AAS Winter Meeting**
Probing Magnetized Turbulence in the Fermi Bubbles ([Grapevine, TX](#))
- 2016 Oct **NAC IV Workshop**
Probing Magnetized Turbulence in the Fermi Bubbles ([Washington, DC](#))

FUNDING

- 2023 LANL Center for Nonlinear Studies Graduate Research Fellowship
EUSTIPEN Travel Grant
JINA Travel Grant
- 2022 Seaborg Institute Graduate Student Research Fellowship
LANL Center for Nonlinear Studies Graduate Research Fellowship
JINA Travel Grant
- 2019 EUSTIPEN Travel Grant
JINA Travel Grant

OUTREACH

- 2023 Jan **Astronomy Days** at North Carolina Museum of Natural Sciences ([Raleigh, NC](#))
- 2022 Nov **Astronomy on Tap** ([Durham, NC](#))
- 2020 Jan **Astronomy Days** at North Carolina Museum of Natural Sciences ([Raleigh, NC](#))
- 2018 Aug **LEAP Workshop** at North Carolina State University ([Raleigh, NC](#))
- 2017 Jul **Designed plan for Galaxy Garden** at VLA visitor center ([Magdalena, NM](#))
- 2017 Jul **Restored 2-dish interferometer** at Frank T. Etsorn Observatory ([Socorro, NM](#))
- 2016 Jul **Public Tours** of Very Large Array (VLA) facilities ([Magdalena, NM](#))

PROFESSIONAL DEVELOPMENT

- 2025 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](#))

LANGUAGES

Native Proficiency: English, Catalan, Spanish
Working Proficiency: Italian
Elementary Proficiency: French, German
Computational: Python, HPC, Mathematica, Data Visualization

SELECTED REFERENCES

Prof. Gail McLaughlin Dept. of Physics NC State University Raleigh, NC 27697 gcmclaug@ncsu.edu	Dr. Jonah Miller CCS-2 Los Alamos National Laboratory Los Alamos, NM 87545 jonahm@lanl.gov	Prof. Rebecca Surman Dept. of Physics Notre Dame University South Bend, IN 46556 rsurman@nd.edu	Prof. George Fuller Dept. of Physics UC San Diego La Jolla, CA 92093 gfuller@ucsd.edu
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