

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
2016-2017 **National Radio Astronomy Observatory** *Undergraduate Research Assistant*

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

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](#)”, *The Astrophysical Journal*, 970, 173 (2024)
K.A. Lund, G.C. McLaughlin et al. “[Magnetic Field Strength Effects on Nucleosynthesis from Neutron Star Merger Outflows](#)”, *The Astrophysical Journal*, 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](#)”, *The Astrophysical Journal* 962, 79 (2024)
E.M. Holmbeck, J. Barnes, **K.A. Lund**, et al. “[Superheavy Elements in Kilonovae](#)”, *Astrophysical Journal Letters* 951, L13 (2023)
K.A. Lund, J. Engel et al. “[The Influence of Beta Decay Rates on r-Process Observables](#)”, *The Astrophysical Journal* 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](#)”, *The Astrophysical Journal* 918, 44 (2021)
Y.L. Zhu, **K.A. Lund** et al. “[Modeling Kilonova Light Curves: Dependence on Nuclear Physics Inputs](#)” *The Astrophysical Journal* 906, 94 (2021)

PRESENTATIONS

Invited Talks

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

- 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

- 2023 Sep **17th International Symposium on Nuclei in the Cosmos**
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. Etschorn Observatory ([Socorro, NM](#))
- 2016 Jul **Public Tours** of Very Large Array (VLA) facilities ([Magdalena, NM](#))

TEACHING

North Carolina State University

PY 125 - Astronomy Lab (Fall 2018)

University of California San Diego

PHYS 161 - Black Holes (Spring 2016, 2017)

PHYS 13 - Life in the Universe (Fall 2016)

PROFESSIONAL DEVELOPMENT

- 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, Spanish, Catalan

Working Proficiency: Italian

Elementary Proficiency: French, German

Computational: Python, HPC, Mathematica, Data Visualization

REFERENCES

Prof. Gail McLaughlin
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