

Kelsey Lund

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EDUCATION

Expected 2024 **Ph.D. Physics** North Carolina State University, Raleigh, NC
2020 **M.S. Physics** North Carolina State University, Raleigh, NC
2017 **B.S. Physics** University of California San Diego, La Jolla, CA

EXPERIENCE

2020 - Present **Los Alamos National Laboratory** *Research Assistant*, Los Alamos, NM
Mentors: Jonah Miller, Matthew Mumpower
2018 - Present **North Carolina State University** *Research Assistant*, Raleigh, NC
Mentor: Gail McLaughlin
Summer 2017 **National Radio Astronomy Observatory** *Site Coordinator*
Summer 2016 **National Radio Astronomy Observatory** *Research Assistant*
Mentor: Christopher Hales
2014-2017 **University of California San Diego** *Research Assistant*
Mentor: George Fuller

PUBLICATIONS

K.A. Lund, G.C. McLaughlin, J. Miller et al. “Magnetic Field Strength Effects on Nucleosynthesis from Neutron Star Merger Outflows”, *submitted to Astrophysical Journal*, arXiv: 2311.05796
T.M. Sprouse, **K.A. Lund**, J. Miller et al. “Emergent Nucleosynthesis from a 1.2 Second Long Simulation of a Black-Hole Accretion Disk”, *submitted to Astrophysical Journal*, arXiv: 2309.07966
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, G.C. McLaughlin et al. “The Influence of Beta Decay Rates on r-Process Observables”, *Astrophysical Journal* 944, 144 (2023)
J. Barnes, Y.L. Zhu, **K.A. Lund**, “Kilonovae Across the Nuclear Physics Landscape: the Impact of Nuclear Physics Uncertainties on r-Process Powered Emission”, *Astrophysical Journal* 918, 44 (2021)
Y.L. Zhu, **K.A. Lund**, J. Barnes et al. “Modeling Kilonova Light Curves: Dependence on Nuclear Physics” *Astrophysical Journal* 906, 94 (2021)

PRESENTATIONS

Invited Talks

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 **Workshop: 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

- 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 Meetings**
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 **Public Talk** at triangle 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, NM](#))
2017 Jul **Designed** plan for **Galaxy Garden** at VLA visitor center [Socorro, NM](#))
2017 Jul **Restored 2-dish interferometer** at Frank T. Etsorn Observatory [Socorro, NM](#))
2016 Jul **Public Tours** of Very Large Array (VLA) facilities [near Socorro, 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

- 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

Elementary Proficiency: Italian, French, German

Computational: Python, HPC, Mathematica, Data Visualization

REFERENCES

Prof. Gail McLaughlin

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Dr. Jonah Miller

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Prof. Rebecca Surman

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Prof. George Fuller

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