

# Kelsey Lund

📍 Los Alamos, NM   ✉ [kalund@ncsu.edu](mailto:kalund@ncsu.edu)   📄 ORCID [0000-0003-0031-1397](https://orcid.org/0000-0003-0031-1397)   🌐 [kelslund.github.io](https://kelslund.github.io)

## EDUCATION

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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

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2020 - Present   **Los Alamos National Laboratory** *Research Assistant*, Los Alamos, NM  
Mentors: Jonah Miller, Matthew Mumpower, Ingo Tews  
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

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**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”, *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, 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

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### Invited Talks

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

- 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 1<sup>st</sup> Place prize**  
**N3AS Summer School in Multi-Messenger Astrophysics**  
*Kilonova Modeling* (Santa Cruz, CA)
- 2022 Jul **15<sup>th</sup> 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

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- 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

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- 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, 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](#))

## TEACHING

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### 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

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- 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

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

**Elementary Proficiency:** Italian, French, German

**Computational:** Python, HPC, Mathematica, Data Visualization

## REFERENCES

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### Prof. Gail McLaughlin

Dept. of Physics  
NC State University  
Raleigh, NC 27697  
[gcmclaug@ncsu.edu](mailto:gcmclaug@ncsu.edu)

### Dr. Jonah Miller

CCS-2  
Los Alamos National Laboratory  
Los Alamos, NM 87545  
[jonahm@lanl.gov](mailto:jonahm@lanl.gov)

### Prof. Rebecca Surman

Dept. of Physics  
Notre Dame University  
South Bend, IN 46556  
[rsurman@nd.edu](mailto:rsurman@nd.edu)

### Prof. George Fuller

Dept. of Physics  
UC San Diego  
La Jolla, CA 92093  
[gfuller@ucsd.edu](mailto:gfuller@ucsd.edu)