Kelsey Lund ☎ +1 (786) 447 8799 kalund@ncsu.edu

## EDUCATION

**Ph.D. Physics** North Carolina State University, Raleigh, NC (Fall 2018 – present)
In progress; advanced to candidacy February 2022
**M.S. Physics** North Carolina State University, Raleigh, NC (2020)
**B.S. Physics** University of California San Diego, La Jolla, CA (2017)

## EXPERIENCE

**Los Alamos National Laboratory,** Graduate Student Researcher (Summer 2020 – Present)
**Mentors:** Jonah Miller, Matthew Mumpower
**Seaborg Institute** Graduate Research Fellowship (Summer 2022)
**Center for Nonlinear Studies** Graduate Research Fellowship (Summer 2022, 2023)
**North Carolina State University,** Graduate Student Researcher (Summer 2018 – Present)
**Mentor:** Gail McLaughlin
**National Radio Astronomy Observatory,** NAC Site Coordinator (Summer 2017)
**National Radio Astronomy Observatory,** Research Assistant (Summer 2016)
**Mentor:** Christopher Hales
**University of California San Diego,** Undergraduate Research Assistant (Spring 2014 – 2017)
**Mentor:** George Fuller

## PUBLICATIONS

*"Emergent Nucleosynthesis from a 1.2 Second Long Simulation of a Black-Hole Accretion Disk"*
T.M. Sprouse, **K.A. Lund,** J.M. Miller et al. submitted to Astrophysical Journal, arXiv: 2309.07966

*"Superheavy Elements in Kilonovae"*
E.M. Holmbeck, J. Barnes, **K.A. Lund,** et al. Astrophysical Journal Letters 951, L13 (2023)

*"The Influence of Beta Decay Rates on r-Process Observables"*
**K.A. Lund**, J. Engel, G.C. McLaughlin, et al. 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**, et al. Astrophysical Journal 918,44 (2021)

*"Modeling Kilonova Light Curves: Dependence on Nuclear Physics"*
Y.L. Zhu, **K.A. Lund**, J. Barnes, et al. Astrophysical Journal 906,94 (2021)

## INVITED TALKS

**2023 Apr** **Invited Seminar,** Virginia Tech Astronomy Seminar (Blacksburg, VA)
Title: Uncertainties and Opportunities in r-Process Observables

**2022 Oct** **Invited Talk,** Workshop: Remnants of Neutron-Star Mergers – Connecting Hydrodynamics Models to Nuclear, Neutrino, and Kilonova Physics (Darmstadt, Germany)
Title: Key Uncertainties in Astrophysical r-Process Nucleosynthesis

**2022 Aug** **Invited Seminar,** N3AS Seminar (virtual)
Title: Effects of Nuclear Uncertainties on r-Process Observables

**2022 Aug** **Invited Seminar,** Los Alamos National Laboratory T-Division Seminar (Los Alamos, NM)
Title: Probing Sources of Uncertainty in Kilonova Modeling

**2021 Oct** **Invited Lecture,** Universitat Politècnica de Barcelona (Barcelona, Spain)
Title: Nucleosynthesis in the Universe

**2021 Oct** **Invited Talk,** INT Program 21-3- Radionuclides: Nuclear Physics, Astrophysical Models, and Observations (virtual)
Title: Nuclear Physics in Kilonova Modeling

## CONTRIBUTED TALKS

**2023 Sep** **Contributed Talk,** ECT* Workshop: MICRA (Microphysics in Computational Relativistic Astrophysics) (Trento, Italy)
Title: Magnetic Field Effects on Nucleosynthesis in Post-Merger Disk Outflows

**2023 Aug** **Contributed Talk,** INT Program 23-2- Astrophysical Neutrinos and the Origin of the Elements (Seattle, WA)
Title: A “Beta” Look at Post-merger Nucleosynthesis

**2022 Sep** **Contributed Talk,** International School of Nuclear Physics, 43$^{rd}$ Course (Erice, Sicily)
Title: Kilonova Modeling: Nuclear Physics, Magnetic Fields, Neutrinos

**2022 Aug** **Talk,** T-Division Student Lightning Talks (Los Alamos, NM)
Title: Magnetic Fields in Kilonova Modeling
**(Awarded 1$^{st}$ Place prize)**

**2022 Aug** **Contributed Talk,** N3AS Summer School in Multi-Messenger Astrophysics (Santa Cruz, CA)
Title: Kilonova Modeling

**2022 Jul** **Contributed Talk,** 15$^{th}$ Intl. Conference on Nuclear Data for Science and Technology (virtual)
Title: Probing Nuclear Uncertainties in Kilonova Modeling

**2022 Jul** **Talk,** LANL CNLS Student Series (Los Alamos, NM)
Title: Kilonova Modeling: Magnetic Fields, Neutrinos, Nuclear Physics

**2022 Jan** **Talk,** ChETEC-INFRA Schools on Nuclear Astrophysics Questions (virtual)
Title: Actinide Dating Stars: Nuclear Uncertainties in Cosmic Age

**2021 Jun** **Contributed Talk,** ECT* Workshop: KRINA (Key Reactions in Nuclear Astrophysics) (virtual)
Title: Sensitivity of the Observed Kilonova Signal to Nuclear Physics

**2020 Nov** **Contributed Talk,** SESAPS Meetings (virtual)
Title: Identification of Key Isotopes in Kilonova Heating

**2020 Nov** **Contributed Talk,** APS Division of Nuclear Physics Meeting (virtual)
Title: Identification of Key Isotopes in Kilonova Heating

**2020 Jul** **Talk,** FIRE Collaboration Annual Meeting (virtual)
Title: Identification of Key r-Process Isotopes in Kilonova Heating

**2019 Oct** **Contributed Talk,** APS Division of Nuclear Physics Meeting (Crystal City, VA)
Title: Uncertainties in Kilonova Heating from Nuclear Physics Inputs

**2019 Jun** **Talk,** FIRE Collaboration Annual Meeting (Brookhaven National Lab, NY)
Title: Uncertainties in Kilonova Light Curves from Nuclear Physics: A Case Study

**2017** **Seminar,** UCSD CASS Journal Club (La Jolla, CA)
Title: r-Process Nucleosynthesis in Quark-Novae

**2016** **Seminar,** NRAO Seminar Series (Socorro, NM)
Title: Probing Magnetized Turbulence in the Fermi Bubbles

**2016** **Seminar,** UCSD CASS Journal Club (La Jolla, CA)
Title: On The Astrophysical Origin of the Elements

**2016** **Contributed Talk,** APS Pacific Coast Gravity Meeting (Fullerton, CA)
Title: On The Astrophysical Origin of the Elements

**2014** **Contributed Talk,** Honors Transfer Council of California Research Conference (Irvine, CA)
Title: Quantum Relativistic Effects on Inorganic Matter

## POSTERS

**2023 Sep** **Poster,** 17th International Symposium on Nuclei in the Cosmos (Daejeon, Korea)
Title: Magnetic Field Effects on Nucleosynthesis from Merger Outflows
**(Awarded prize for Outstanding Poster Presentation)**

**2022 May** **Poster,** JINA Frontiers in Nuclear Astrophysics Meeting (South Bend, IN)
Title: Actinide-Dating Stars: Nuclear Uncertainties in Cosmic Age

**2022 Apr** **Poster,** North Carolina State University Graduate Student Research Symposium (Raleigh, NC)
Title: Actinide-Dating Stars: Nuclear Uncertainties in Cosmic Age

**2017** **Poster,** AAS Winter Meeting (Grapevine, TX)
Title: Probing Magnetized Turbulence in the Fermi Bubbles

**2016** **Poster,** NAC IV Workshop (Washington, DC)
Title: Probing Magnetized Turbulence in the Fermi Bubbles

## OUTREACH

**2023 Jan** **Astronomy Days** at North Carolina Museum of Natural Sciences

**2022 Nov** **Public Talk** at Triangle Astronomy on Tap in Durham, NC

**2020 Jan** **Astronomy Days** at North Carolina Museum of Natural Sciences

**2017 Jul** **Designed** plan for **Galaxy Garden** at VLA visitor center adapted to the high altitude desert environment of the Plains of San Agustin, NM

**2017 Jul** **Restored 2-dish interferometer** at Frank T. Etscorn Observatory in 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)

**2022** 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)

**2021** International Neutrino Summer School (virtual)

**2021** ECT* Workshop: Probing Nuclear Physics with Neutron Star Mergers (virtual)

**2021** 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)

Awarded FRIB-TA EUSTIPEN Travel Grant

**2019** FOE19 Fifty-one Erg Conference (Raleigh, NC)

**2019** JINA First Frontiers Summer School (East Lansing, MI)

**2018** Neutron Physics Summer School (Raleigh, NC)

## LANGUAGES

**Native Proficiency:** English, Spanish, Catalan **Elementary Proficiency:** Italian, German, French

**Computational:** Python, HPC Systems, Mathematica

## AFFILIATIONS AND MEMBERSHIPS

FIRE Collaboration
FRIB Theory Alliance
American Physical Society
JINA-CEE
IReNA Network