

Hunter Duggin

📍 Chapel Hill, NC ✉ hpduggin@unc.edu ☎ +1 (919) 780-1413 in Hunter Duggin 🔗 hpduggin

Research Interests

Theoretical nuclear and particle physics; physics beyond the standard model; low energy effective field theories; hadron spectroscopy; non-Abelian field theories; Quantum Chromodynamics; Lattice computation methods; Lattice QCD; predicting rare nuclear processes.

Education

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|----------------------|---|---------------------|
| Grad. Student | University of North Carolina , Physics | Aug 2024 – Present |
| | <ul style="list-style-type: none"> GPA: 4.0/4.0 Coursework: Classical Dynamics (Goldstien), Quantum Mechanics (Sakurai), Mathematical Methods (Arfken et. al.), Electrodynamics (Jackson), Statistical Mechanics (Landau & Lifshitz), Group Theory (Georgei). | |
| BS | North Carolina State University , Physics (Mathematics Minor) | Aug 2020 – May 2024 |
| | <ul style="list-style-type: none"> GPA: 3.6/4.0 Coursework: Quantum Field Theory I/II (Peskin & Schroder), Nuclear Physics (Krane), Quantum Mechanics I/II (Sakurai, Griffiths & Peebles), Classical Mechanics I/II (Goldstien et. al. & Taylor), Electrodynamics I/II (Jackson & Griffiths), Computational Physics, General Relativity (Carroll). | |

Experience

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| UNC , Research Assistant | Chapel Hill, NC
Jan 2025 – Present |
| <ul style="list-style-type: none"> Investigating the structure of the unitary Fermi gas through the calculation of gravitational form factors (GFFs) on the lattice. Tuning the system towards unitarity creates a conformal theory, so this technique can be used to extract scale invariant physics. under the direction of Dr. Amy Nicholson, Assistant Professor at UNC. future endeavors include lattice QCD calculations. | |
| JLab , SULI Student | Newport News, VA
May 2024 – Aug 2024 |
| <ul style="list-style-type: none"> Worked on the designing of an experimental laboratory used to create high performance polarized He-3 targets in Jefferson lab's experimental equipment lab. Under the direction of Dr. Arun Tadeipalli, staff scientist at JLab. Additional responsibilities included experimental equipment calibration, RadCon II (contamination) training, Cleaning / repairing contaminated Helmholtz coils, Backend electronics, etc. | |
| NC State , Research Assistant | Raleigh, NC
May 2024 – Aug 2024 |
| <ul style="list-style-type: none"> Worked on interpolating the 't Hooft model between instant form dynamics and light front dynamics in the Coulomb gauge. Under the mentorship of Dr. Chueng Ji, Professor at North Carolina State university and Bailing Ma, Postdoc at ANL. | |

Conferences

- | | |
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| SPIN 2023 (Poster)
<i>Interpolating the 't Hooft Model Between IFD and LFD in the Coulomb Gauge</i>
Hunter Duggin , Chueng Ji, Bailing Ma | Durham, NC
Sept 2023 |
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[Conference Indico Page](#)

APS / JPS Division of Nuclear Physics Joint Meeting 2023 (Oral)

Interpolating the 't Hooft Model Between IFD and LFD in the Coulomb Gauge

Hunter Duggin, Chueng Ji, Bailing Ma

[Conference Indico Page](#)

Waikoloa, HI

Dec 2023

National Conference on Undergraduate Research (Poster)

Interpolating the 't Hooft Model Between IFD and LFD in the Coulomb Gauge

Hunter Duggin, Chueng Ji, Bailing Ma

[Conference Page](#)

Long Beach, CA

April 2024

McCormick Symposium (Poster)

Interpolating the 't Hooft Model Between IFD and LFD in the Coulomb Gauge

Hunter Duggin, Chueng Ji, Bailing Ma

[Conference Page](#)

Raleigh, NC

April 2024

JLab SULI Session (Poster)

Polarized He-3 Target Set-up

Hunter Duggin, Arun Tadepalli, Paul Kigaya, Hannah Murphy, Evan Utne

[Conference Page](#)

Newport News, VA

Aug 2024

Proceedings

Interpolating the 't Hooft model between Instant and Light-Front dynamics in the Coulomb Gauge

Hunter Duggin, Chueng Ji, Bailing Ma

[10.22323/1.456.0051](#)

July 2024

Software Skills

Programming Languages: Python, Mathematica, Excel, LabVIEW, C, C++

Technologies: Final Cut Pro X, Logic Pro X, Apple Motion, Davinci Resolve, FL Studio, Adobe Premiere, Adobe Photoshop, Adobe Illustrator, Affinity photo, Affinity Designer.

Teaching

Spring 2023: PY 415: "Electromagnetism II"

Undergraduate Learning Assistant, NCSU

Fall 2024: PHYS 119: "Electromagnetism and Quanta"

Graduate Teaching Assistant, UNC

Spring 2025: PHYS 119: "Electromagnetism and Quanta"

Graduate Teaching Assistant, UNC

Summer II 2025: PHYS 119: "Electromagnetism and Quanta"

Graduate Teaching Assistant, UNC

Outreach

Physics From the Ground Up, Head

May 2025 - Present

- Graduate Student talks affiliated with UNC's APS chapter that involve 20-30 minute mini lectures on physics related topics. Takes place at Lanza's Cafe in Carrboro, NC.
- Responsible for recruiting speakers, deciding dates, coordinating with cafe staff, and managing team members.

Triangle Astronomy on Tap, Team Member

Aug 2024 - Present

- Speakers from universities in and around the triangle area give public lectures to the public on fun and interesting topics
- Responsible for the photography, videography, merchandise design, and social media marketing.

NC State Department of Physics, Abstract Videographer

May 2022 - May 2024

- Helped produce and film a number of videos for the CDSA REU summer program at NC State.
- Further produced videos for graduate students during the school semester.
- Under the direction of Dr. Katie Mack, Hawking chair at the Perimeter Institute.