Nolan **Miller**

PhD

Department of Physics & Astronomy, University of North Carolina at Chapel Hill

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Education

University of North Carolina — *Chapel Hill, North Carolina*

PhD in Physics — *August 2015 - May 2022*

- Dissertation: *Applications of chiral perturbation theory to lattice quantum chromodynamics*
- Advisor: Amy Nicholson

University of South Carolina — *Columbia, South Carolina*

BS in Physics and Mathematics — *August 2011 - May 2015*

- *Summa cum laude*
- With distinction in Mathematics

Honors & Awards

Office of Science Graduate Student Research Award — *University of North Carolina*

Department of Energy, Office of Science Fellowship. — *January 2021 - December 2021*

- Granted for proposal *Measuring hyperon observables using lattice quantum chromodynamics*

President's Honor Role — *University of South Carolina*

Awarded to those holding a 4.0 for that semester. — *Fall 2012 - Spring 2015*

Nina & Frank Avignone Fellow — *University of South Carolina*

Awarded to a single outstanding senior physics major. — *2015*

Rising Senior Award in Physics — *University of South Carolina*

Awarded to a single rising senior physics major. — *2014*

Edwin R and Elizabeth F Jones Endowed Scholarship — *University of South Carolina*

Awarded to a single rising junior or senior of the University of South Carolina majoring in chemistry, physics, or math who graduated from a South Carolina high school. — *2013*

Talks

Extracting the pion-nucleon sigma term from the lattice — *Berkeley Lab - virtual*

Seminar — *June 2022*

- In which I review the sigma term, its applications, recent work from lattice collaborations, and our preliminary analysis.

$|V_{us}|$ from the lattice — *Los Alamos National Lab - virtual*

Invited — *November 2021*

- In which I outline various approaches to calculating $|V_{us}|$ using lattice QCD

The nucleon mass and sigma term from lattice QCD — *IHEP, CAS - virtual*

10th International Workshop on Chiral Dynamics — *November 2021*

- In which I present preliminary work on calculating the nucleon mass and nucleon-pion sigma term, the latter of which has implications for direct dark matter searches

Determining properties of hyperons — *MIT - virtual*

38th International Symposium on Lattice Field Theory — *July 2021*

- In which I present a preliminary work on calculating the hyperon masses and axial charges, as well as their relevance to top-row unitarity

V_{us} from hyperon semileptonic decays [poster] — *Berkeley Lab - virtual*

Director's Review of the Nuclear Science Division — *June 2021*

- In which I review methods of determining $|V_{us}|$ from leptonic kaon decays, semileptonic kaon decays, and (emphatically) semileptonic hyperon decays

Lattice calculation of F_K/F_π from a mixed domain-wall on HISQ action *New Orleans, Louisiana - virtual*

2020 Fall Meeting of the APS Division of Nuclear Physics *October 2020*

- In which I present a calculation of F_K/F_π, which provides an alternate strategy for calculating $|V_{us}|$

Publications

The hyperon spectrum from lattice QCD *PoS(LATTICE2021)*

doi: https://doi.org/10.22323/1.396.0448; arXiv:2201.01343 *May 2022*

Scale setting the Möbius domain wall fermion on gradient-flowed HISQ action using the omega baryon mass and the gradient-flow scales t_0 and w_0 *Physical Review D*

doi: 10.1103/PhysRevD.103.054511; arXiv:2011.12166 *March 2021*

F_K/F_π from Möbius Domain-Wall fermions solved on gradient-flowed HISQ ensembles *Physical Review D*

doi: 10.1103/PhysRevD.102.034507; arXiv:2005.04795 *August 2020*