

## CONTACT

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## RESEARCH INTERESTS

Nuclear and particle physics; Nonperturbative aspects of quantum field theory; Sign problem in Monte Carlo studies of field theories (finite fermion density, real-time observables); Applications of quantum computers to lattice field theories

## EDUCATION

Ph.D., Physics, University of Maryland, College Park, 2017-2020. Thesis advisor: Paulo F. Bedaque.

Astronomy, University of Maryland, College Park, 2015-2017.

B.S., Physics and Computer Science, University of Maryland, College Park, 2011-2015.

## MENTEES

Hersh Kumar, Summer 2019. *Quantum Circuits for Evolution of  $S(1080)$  Gauge Theory*. Paper in preparation.

## PAPERS

Scott Lawrence. *Perturbative Removal of a Sign Problem*. arXiv:2009.10901 (2020).

Thomas D. Cohen, Scott Lawrence, Yukari Yamauchi *The thermodynamics of large- $N$  QCD and the nature of metastable phases*. arXiv:2006.14545 (2020).

NuQS Collaboration (Henry Lamm, Scott Lawrence, Yukari Yamauchi). *Suppressing Coherent Gauge Drift in Quantum Simulations*. arXiv:2005.12688 (2020).

Scott Lawrence, Zeev Rogozinski. *The Brute-Force Search for Planet Nine*. arXiv:2004.14980 (2020).

Scott Lawrence. *Sign Problems in Quantum Field Theory: Classical and Quantum Approaches*. Doctoral thesis (2020).

- NuQS Collaboration (Siddhartha Harmalkar, Henry Lamm, Scott Lawrence). *Quantum Simulation of Field Theories Without State Preparation*. arXiv:2001.11490 (2020).
- Andrei Alexandru, Paulo F. Bedaque, Scott Lawrence. *Quantum algorithms for disordered physics*. Phys.Rev A101 (2020) no.3, 032325.
- NuQS Collaboration (Henry Lamm, Scott Lawrence, Yukari Yamauchi). *Parton physics on a quantum computer*. Phys.Rev.Res. 2 (2020) no.1, 013272.
- NuQS Collaboration (Andrei Alexandru, Paulo F. Bedaque, Siddhartha Harmalkar, Henry Lamm, Scott Lawrence, Neill C. Warrington). *Gluon Field Digitization for Quantum Computers*. Phys.Rev. D100 (2019) no.11, 114501.
- NuQS Collaboration (Henry Lamm, Scott Lawrence, Yukari Yamauchi). *General Methods for Digital Quantum Simulation of Gauge Theories*. Phys.Rev. D100 (2019) no.3, 034518.
- NuQS Collaboration (Andrei Alexandru, Paulo F. Bedaque, Henry Lamm, Scott Lawrence). *Sigma models on quantum computers*. Phys.Rev.Lett. 123 (2019) no.9, 090501.
- Andrei Alexandru, Paulo F. Bedaque, Henry Lamm, Scott Lawrence, Neill C. Warrington. *Fermions at Finite Density in 2+1 Dimensions with Sign-Optimized Manifolds*. Phys.Rev.Lett. 121 (2018) no.19, 191602.
- Andrei Alexandru, Gökce Basar, Paulo F. Bedaque, Henry Lamm, Scott Lawrence. *Finite Density QED<sub>1+1</sub> Near Lefschetz Thimbles*. Phys.Rev. D98 (2018) no.3, 034506.
- Henry Lamm, Scott Lawrence. *Simulation of Nonequilibrium Dynamics on a Quantum Computer*. Phys.Rev.Lett. 121 (2018) no.17, 170501.
- Andrei Alexandru, Paulo F. Bedaque, Henry Lamm, Scott Lawrence. *Finite-Density Monte Carlo Calculations on Sign-Optimized Manifolds*. Phys.Rev. D97 (2018) no.9, 094510.
- Andrei Alexandru, Paulo F. Bedaque, Henry Lamm, Scott Lawrence. *Deep Learning Beyond Lefschetz Thimbles*. Phys.Rev. D96 (2017) no.9, 094505.
- Scott Lawrence, Justin G. Tervala, Paulo F. Bedaque, M. Coleman Miller. *An Upper Bound on Neutron Star Masses from Models of Short Gamma-ray Bursts*. Astrophys.J. 808 (2015) 186.
- Scott Lawrence, Qin Liu, Victor Yakovenko. *Global Inequality in Energy Consumption from 1980 to 2010*. Entropy 15, no. 12: 55655579 (2013).
- Christopher Brust, Andrey Katz, Scott Lawrence, Raman Sundrum. *SUSY, the Third Generation and the LHC*. Journal of High Energy Physics 2012:103 (2011).

## PAPERS IN PREPARATION

Hersh Kumar, Scott Lawrence, Yukari Yamauchi. *Quantum Circuits for Evolution of  $S(1080)$  Gauge Theory.*

## PROCEEDINGS

Scott Lawrence. *Beyond Thimbles: Sign-Optimized Manifolds for Finite Density.* PoS LATTICE2018 (2018) 149.

## TALKS

*From Qubits to Quarks: Parton Physics on a Quantum Computer.* DNP Meeting (2019).

*Analytic Continuation and the Real-Time Sign Problem.* SIGN'19 (2019).

*Quantum Simulation of Gauge Theory.* Seminar, The George Washington University (2019).

*Manifolds of Glory: Complex Contours for Ameliorating the Sign Problem.* SIGN'18 in Universität Bielefeld (2018).

*Beyond thimbles: Sign-optimized manifolds for finite density.* LATTICE (2018).

*Beyond thimbles: Integration contours to solve a sign problem.* Nuclear theory seminar, University of Maryland (2018).

*Approximating waveforms of rapidly rotating neutron stars.* 21st International Conference On General Relativity and Gravitation (2016).