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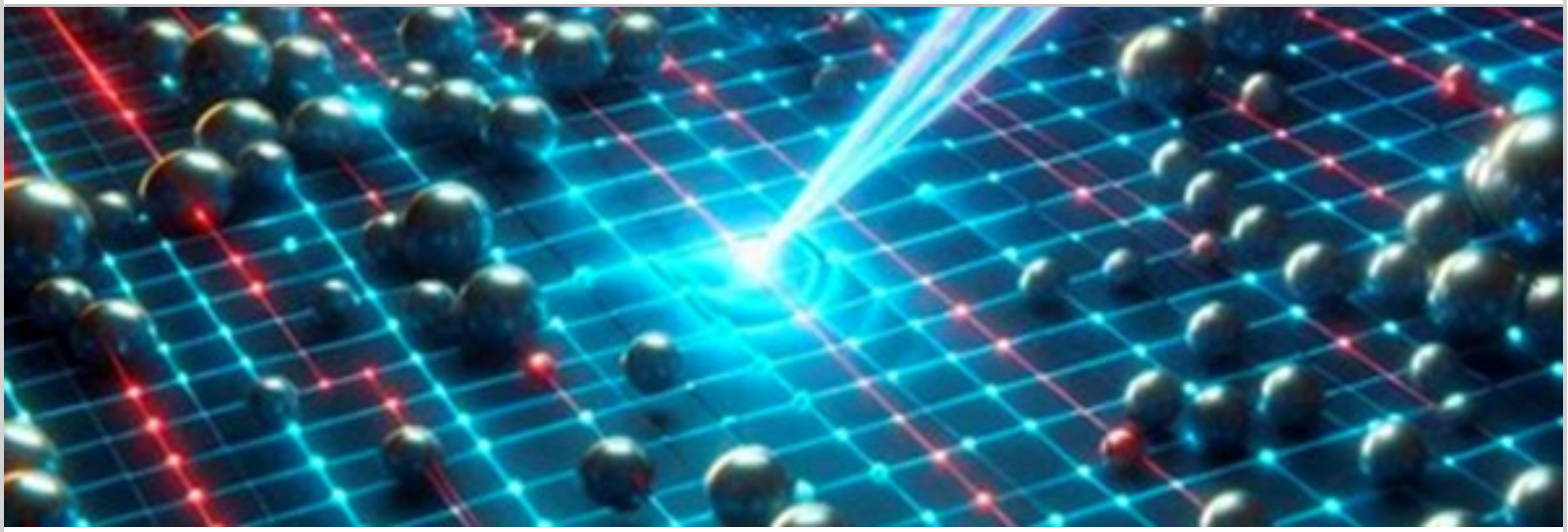
UNIVERSITY of WASHINGTON

QUANTUMX

WINTER 2025



Scientists take an important step toward mitigating errors in analog quantum simulations of many-body problems

A new framework for quantifying uncertainties increases the predictive power of analog quantum simulations. To succeed, these simulations need theoretical approximations of how quantum computers represent many-body systems. Nuclear physicists developed a new framework to analyze these approximations and minimize their effects.

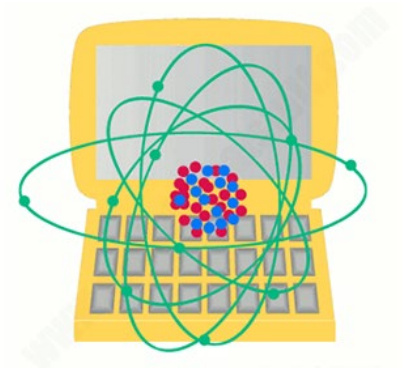
Serena Eley — studying superconductivity, magnetism, and disorder in quantum materials

UW ECE Assistant Professor and QuantumX member Serena Eley studies quantum vortices. Her research

group examines superconductors and magnets, searching for ways to fine-tune the atomic disorder landscape in these materials and leverage their unique properties for quantum technology development. Her research involves finding ways to control the motion and formation of quantum vortices by optimizing defects in superconductors, work aimed at further enhancing conductivity and reducing energy loss.

QuantumX launches NSF-funded undergraduate summer research program

Led by computer science and QuantumX professor Andrea Coladangelo and QuantumX chair and Virginia and Prentice Bloedel Professor in Physics and electrical & computer engineering Kai-Mei Fu, the Quantum@UW Research Experiences for Undergraduates (REU) program offers students the opportunity to conduct research on a variety of topics in quantum information science and engineering.



RESEARCH HIGHLIGHTS

A computational test of quantum contextuality, and even simpler proofs of quantumness
Atul Singh Arora, Kishor Bharti, Alexandru Cojocaru, Andrea Coladangelo
Arxiv.org

A QCA for every SPT
Lukasz Fidkowski, Jeongwan Haah, Matthew B. Hastings
Arxiv.org

Non-volatile Tuning of Cryogenic Optical Resonators
Rui Chen, I-Tung Chen, Sanskriti Joshi, Arka Majumdar, Mo Li, Sajjad Moazeni
Arxiv.org

Sequency hierarchy truncation (SeqHT) for adiabatic state preparation and time evolution in quantum simulations
Zhiyao Li, Dorota M Grabowska, Martin J Savage
Arxiv.org

Strain tuning of vestigial three-state Potts nematicity in a correlated antiferromagnet
Kyle Hwangbo, Elliott Rosenberg, John Cenker, Di Xiao, Jiun-Haw Chu, Xiaodong Xu
Nature Physics

Steps toward quantum simulations of hadronization and energy loss in dense matter
Roland C. Farrell, Marc Illa, Martin J. Savage
Physical Review C

Technologies for modulation of visible light and their applications
Sanghyo Park, Milica Notaros, Sara Mouradian
Science Direct

Solution-processed quantum dot nanolaser operating at telecommunication wavelength
Minho Choi, David Sharp, Hao Nguyen, Brandi Cossairt, Arka Majumdar
SPIE Digital Library

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