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University of Miami, Physics Department Colloquium

Date: Monday, Feb 12, 2024
Time: 4:00 pm – 5:00 pm
Location: Wilder Auditorium – Rm 112, Knight Physics Building

Exploring Quantum Harmony between Superconducting Circuits & Cold Atoms

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Abstract

Join me in this talk as I share my research journey in quantum information science, transitioning from cold atoms to superconducting circuits and exploring their harmonious collaboration in advancing quantum science and technology. In the first part, I'll discuss the demonstration of a quantum-enhanced sensing technique at microwave frequencies using superconducting circuits to accelerate the search for weak signals arising from physics beyond the Standard Model, with a specific focus on axion dark matter searches. Shifting gears in the second part, we'll delve into quantum optics experiments that utilize the nonlinear interaction between the cold atomic ensemble and optical photons, unveiling the fascinating realm of non-Hermitian quantum optics. Wrapping up, we'll explore the exciting science that leverages the strengths of both systems, utilizing atomic-superconducting hybrid systems to bridge the gap between quantum information science in optical and microwave frequencies.

Biography

Yue (Joyce) Jiang is a postdoctoral research associate at JILA. She earned her Ph.D. in Physics from the Hong Kong University of Science and Technology under the guidance of Prof. Shengwang Du in 2020, focusing on studying the nonlinear interaction between photons and laser-cooled atomic ensembles. Currently at JILA, she works with Prof. Konrad Lehnert on developing quantum-enhanced sensing techniques for weak signal detection using superconducting circuits.