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UNIVERSITY OF RHODE ISLAND QUANTUM INFORMATION

You are invited to join us for a talk as part of our semester colloquium series

Presenter: Dr. Joel I-Jan Wang (MIT)

Date & Time: Friday September 27, 2024
4:00 - 4:50 PM

Location: East Hall Room 112

Title: Hyper Superconducting Quantum Circuits with van der Waals Heterostructures

Abstract:
Van der Waals materials constitute diverse layered 2D crystals, spanning semi-metals, insulators, semiconductors, ferromagnetic materials, superconductors, and topological insulators. These materials can be intricately assembled to form van der Waals heterostructures, holding significant promise for constructing key components for emerging solid-state quantum computing platforms. Conversely, superconducting circuits and circuit quantum electrodynamics (cQED) techniques offer a distinctive and potent toolkit for investigating novel quantum materials, complementing traditional quantum transport measurements.

In this presentation, I will explore superconducting quantum circuits constructed using van der Waals heterostructures, which play a central role in advancing and enhancing existing quantum technologies. Moreover, I will share insights from our recent studies concerning the kinetic inductance and pairing symmetries of 2D superconductors, such as NbSe2 and magic-angle twisted bilayer graphene (MATBG). By utilizing superconducting circuits and cQED techniques, our research endeavors to deepen understanding and harness the potential of these materials for quantum technologies.

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