COLUMBIA UNIVERSITY PHYSICS DEPARTMENT

PHYSICS COLLOQUIUM

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SEPTEMBER 23, 2024 | 12:30 PM EST
CENTER FOR THEORETICAL PHYSICS
PUPIN HALL, 8TH FLOOR

"Quantum Science with Tweezer Arrays"

Optical tweezer arrays have had a transformative impact on atomic and molecular physics over the past years, and they now form the backbone for a wide range of leading experiments in quantum computing, simulation, and metrology. Underlying this development is the simplicity of single particle control and detection inherent to the technique. I will introduce the key concepts associated with this approach and then give an overview of experimental results from our group, including quantum simulation challenging classical computers, novel schemes merging quantum computing and metrology, and an outlook towards scalability with our most recent results on controlling over 6,000 atomic qubits.