RIKEN QUANTUM COMPUTING

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3rd RQC Colloquium

Quantum science with microscopically controlled arrays of two-electron atoms

Prof. Adam Kaufman

JILA, University of Colorado

June 15, 2022(Wed) **9:00–10:00**(JST)

This colloquium will be held **ONLINE**.

Registration: https://forms.gle/bpG2etS1Qkyn796H9

The growing field of quantum science seeks to leverage features of quantum mechanics – like entanglement and superposition – to perform tasks that are impossible with classical resources alone. Impacting areas ranging from cybersecurity to measurement science, the field has seen tremendous activity in both the public and private sector, in fundamental and applied physics. Central to the quantum science program is developing methods to prepare, control, and detect objects that can host quantum information. Among leading platforms like trapped ions and superconducting qubits, neutral atoms in arrays of tightly-focused beams of light ("optical tweezers") have seen great advances in the past two decades. In this talk, I will describe ongoing work at JILA where we have explored a new type of atom — two-electron atoms — for optical tweezer trapping. While the increased complexity of these atoms leads to challenges, they also offer new scientific opportunities by virtue of their rich internal degrees of freedom. Consequently, they have had broad impact on neutral atom quantum science, in areas ranging from quantum information processing to quantum metrology. I will report on my group's progress in these areas, with a focus on quantum computing.