

Thorium-229 nuclear clock: nuclear physics meets metrology (25+5)

Wednesday, January 15, 2025 2:50 PM (30 minutes)

Laser-based measurement and control of atomic and molecular states form the foundation of modern quantum technology and provide deep insights into fundamental physics. In this talk, I'll present our work in JILA on quantum-state-resolved thorium-229 nuclear laser spectroscopy using a coherent frequency comb in the vacuum-ultraviolet. I will also discuss our recent effort producing thin-film thorium-229 fluoride targets, demonstrating a novel platform towards future nanophotonic integration of nuclear clocks. This unification of precision metrology and nuclear physics sparks new ideas for fundamental physics tests and promises robust nuclear-based timing applications.

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