

Abstract Submitted  
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**Constraints on Ultralight Dark Matter with an Optical Lattice Clock**<sup>1</sup> COLIN KENNEDY, ERIC OELKER, TOBIAS BOTHWELL, DHARUV KEDAR, LINDSAY SONDERHOUSE, EDWARD MARTI, SARAH BROMLEY, JOHN ROBINSON, JUN YE, NIST, JILA-University of Colorado — I report on experimental results of a search for ultralight dark matter by frequency comparison of a 21 cm, cryogenic, ultrastable silicon cavity to a 1D optical lattice clock. Sensitivity to dark matter is provided by the different couplings of the silicon atom bond length and the strontium atom clock transition to time variations in the fine structure constant,  $\alpha$ . Comparison of the length of a single crystal of silicon to the clock laser transition energy in strontium therefore provides a sensitive probe of time variation of  $\alpha$ . Experimental results will be presented in addition to a discussion of theories of ultralight dark matter which can be tested with this platform.

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