

## **Laser Excitation of the Thorium-229 Nucleus - Towards a Nuclear Clock**

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Motivated by the prospect of building a nuclear clock, we have demonstrated laser excitation of the low-energy (8.4 eV) nuclear isomer in Th-229, using Thorium-doped calcium fluoride crystals and a tabletop tunable laser system at 148 nm wavelength. A nuclear resonance fluorescence signal has been observed in crystals with different Th-229 dopant concentrations and over a wide temperature range, while it was absent in a control experiment using a crystal doped with Th-232. These results open the door towards laser Mössbauer spectroscopy and ideas from "quantum nucleonics" and have opened a rapidly developing field of experiments. An accurate nuclear clock would show high sensitivity to effects of "new physics" for example in searches for violations of the Einstein equivalence principle.