



University of Crete
Department of Physics

Physics Colloquium

Thursday, 29 February 2024 | 17:00 – 18:00, Seminar Room, 3rd floor

Parity violation in atoms

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ABSTRACT

Studies of atomic parity violation (PV) offer an opportunity to observe the effects of the weak force in atomic systems. Such studies can provide information about the electroweak sector of the standard model of particle physics and nuclear physics. In particular, measuring a PV observable in a given isotope of an element, when combined with precision atomic calculations, allows to determine the nuclear weak charge; while PV-effect comparison in two (or more) isotopes can be used to probe either physics beyond the standard model, or, the variation of the nuclear neutron skin among the isotopes. In addition, checking spin-dependent PV effects in isotopes with nuclear spin can yield information about hadronic weak interactions. After an introduction to the field of atomic PV, I will describe an experimental program within which we aim to precisely compare the PV effect in several isotopes of the element ytterbium, and as well to determine spin-dependent PV effects. I will discuss recent results regarding the isotopic variation of atomic PV, and talk about the prospects to probe the variation of neutron skin among ytterbium isotopes, as well as to probe hadronic weak forces.