



University of Crete
Department of Physics

Physics Colloquium

Thursday, 05 March 2026 | 17:00 – 18:00, Seminar Room 3rd Floor

Life on an Endless Hill: Making Sense of Up-Side-Down Potentials in Quantum Mechanics and High Energy Physics

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ABSTRACT

In classical physics, unbounded (or "up-side-down") potentials do not allow for a stable ground state. As a consequence, unbounded potentials have often been dismissed as not viable for proper unitary quantum theories. Historically, we have learned that the quantum world often contradicts dearly held beliefs based on classical physics. By contrast, mathematics has been recognized as a good guide even when classical intuition fails. In this talk, I will use well-developed mathematics to explore physical systems with up-side-down and non-Hermitian potentials in quantum mechanics and quantum field theory, with applications to AMO experiments, high energy physics and Quantum Chromodynamics.
