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Casting Light on Antimatter with ALPHA Project at CERN: Fundamental Physics with Trapped Antihydrogen[1]

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Testing fundamental symmetries plays an important role in our understanding of Nature. Experiments at CERN's Antiproton Decelerator facility aim to make precision tests of matter-antimatter symmetry, in particular CPT (charge, parity, time reversal), by comparing the properties of hydrogen with those of its antimatter counterpart, antihydrogen. Demonstration of trapping of antihydrogen atoms by the ALPHA collaboration, and subsequent observation of their long-time confinement, have opened up new experimental possibilities in antimatter physics. Most recently, ALPHA has succeeded in demonstrating the first spectroscopic measurement on anti-atoms, via microwave resonance. I this talk, I will discuss how to make and trap antihydrogen atoms. I will also discuss the prospects of fundamental symmetry tests with antihydrogen, including the possibility of measuring the gravitational interaction of antimatter.

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