ID contributo: **42** Tipo: **Invited**

Precise physics of atomic species utilizing antimatter

mercoledì 8 novembre 2023 12:00 (25 minuti)

Several high-precision experiments at the Antiproton Decelerator complex at CERN aim to look for any significant differences between matter and antimatter. One of these experiments is AEgIS, whose primary goal is to test the weak equivalence principle for antimatter by measuring (with atomic accuracy) the free fall of a neutral antihydrogen atom in the Earth's gravitational field. It turns out that the experimental setup and techniques developed at AEgIS, when expanded appropriately, probably can be used to produce on-demand complex bound states of matter and antimatter, and then to study their spectroscopic properties. One such natural direction is the possibility of producing neutral antiprotonic atoms, i.e., atoms in which one of the electrons is substituted by almost 2,000 times heavier antiproton. Taking medium-heavy odd-A antiprotonic atoms as an example, during my talk I will present how this research can contribute to a better understanding of the bound states of matter and antimatter, as well as the internal structure of atomic nuclei, and how it could potentially become yet another opportunity in precise testing of fundamental theories.

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Classifica Sessioni: Day 3 - Morning