



Contribution ID: 61

Type: **Oral presentation**

Antihydrogen production in the GBAR experiment at CERN

Tuesday 9 September 2025 10:00 (20 minutes)

The GBAR experiment at the Extra Low Energy Antiproton ring ELENA at CERN aims to produce positive antihydrogen ions (Hbar^+), the pure antimatter bound state of two positrons together with one antiproton, and the charge conjugate to the (fragile) H^- ion. The production of such ions requires an experimentally challenging two step formation process, but it will open the door for next generation precision experiments with antimatter, since the experimental expense for manipulation and cooling of those states is vastly reduced. Here we present the efforts of the GBAR collaboration over the last years towards such a goal, in particular the order-of-magnitude increase in the production of neutral antihydrogen atoms during the beam time of 2024. This yields the first formation step for Hbar^+ ions and brings the project into the starting blocks for an exploration of the 2S-2P Lamb shift on beam like antihydrogen atoms. The experimental installations needed for such a first antimatter physics measurement in GBAR will also be detailed in this talk.

Author: Dr REGENFUS, Christian (ETH Zurich)

Presenter: Dr REGENFUS, Christian (ETH Zurich)

Session Classification: Session