

## Project ALPHA and the Future of Antihydrogen Physics

Following the success of ATHENA and ATRAP at producing antihydrogen atoms from cold plasmas of trapped positrons and antiprotons, it is natural to contemplate the prospect for trapping the anti-atoms. The ALPHA (Antihydrogen Laser PHysics Apparatus) collaboration has been formed to design and construct a next-generation antihydrogen apparatus at the CERN Antiproton Decelerator (AD). In this talk I will present the design, physics goals, and status of the ALPHA project. The heart of the device is a superconducting magnet system comprising a transverse multipole and mirror coils for trapping antihydrogen. An annihilation vertex detector based on silicon strip modules will diagnose antihydrogen formation and trapping. The collaboration intends to begin antihydrogen production and trapping studies with this device in mid-2006.

J.S. Hangst on behalf of the ALPHA Collaboration: