

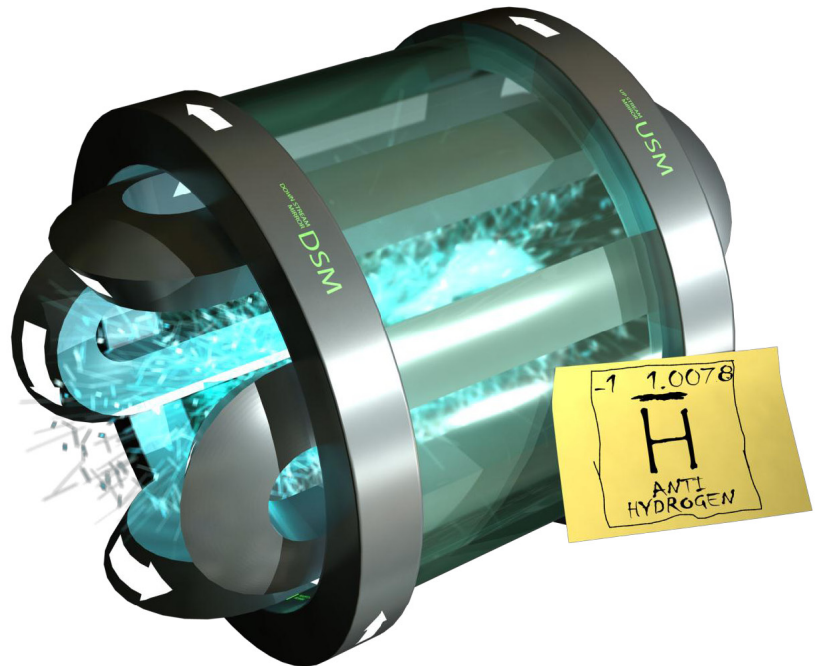
*Program in Plasma Science and Technology  
Distinguished Speaker Lecture Series*

**Professor Jonathan Wurtele**  
University of California, Berkeley  
Alpha Collaboration, CERN



# ***Trapping Antihydrogen: An Adventure in Modern Physics***

The positron, first predicted in 1931 by Dirac, was discovered experimentally by Anderson in 1932. It was not until 1955 that Segre and Chamberlain discovered the antiproton and not until 2002 that cold antihydrogen, consisting of a positron and antiproton, was routinely synthesized at CERN. These antihydrogen were not confined nor could their detailed structure be probed. Trapping cold antihydrogen was achieved last year, for the first time, by the ALPHA collaboration at CERN, marking a milestone in the quest to measure the physical properties of neutral antimatter needed for precision tests of fundamental symmetries of nature such as the CPT (charge conjugation/parity/time reversal) theorem. CPT requires that hydrogen and antihydrogen must have identical spectra. Fundamental questions on the gravitational interactions of antimatter, such as does it go up or down in the earth's gravity, may be answered in future experiments. In this talk, I will describe what we plan to study by experiments on antihydrogen, how our trap works, and the critical role plasma physics plays in antihydrogen trapping.



**WEDNESDAY, APRIL 13, 2011 - 8:00 p.m.**  
Room 104, Computer Science Building, Olden St., Princeton, NJ