

# PHYSICS COLLOQUIUM

Thursday, September 17, 2009  
3:50 PM, Room 111, Life Sciences

*“Antihydrogen Production, Trapping and Antimatter  
Plasmas”*

Joel Fajans  
University of California at Berkeley

Since 2002, experiments at CERN have been producing slow, but untrapped, antihydrogen. The ultimate goal of these experiments is to test CPT and the gravitational interactions of matter and antimatter. Most schemes to perform CPT and gravity tests require trapped antihydrogen, but trapping antihydrogen is much more difficult than merely synthesizing it. The principal problems that must be solved before we can trap are how to cool the antiprotons, and how to keep them cold during the synthesis process. While we have already learned how to cool antiprotons by ten orders of magnitude, we must cool them by four more orders of magnitude, a scale set by the relative size of the potentials of the antimatter plasmas from which the antiatoms are synthesized compared to the antihydrogen trap well depth. In this talk, I will discuss antihydrogen synthesis and some of the techniques we are developing to control the energy of the resultant antihydrogen.