PHYSICS AND ASTRONOMY
COLLOQUIUM

Dr. Art Olin

TRIUMF & University of Victoria

"ALPHA's Adventures with Antimatter"

Abstract

ALPHA is an international project at the CERN AD whose primary aim is to test fundamental symmetries between matter and antimatter using trapped antihydrogen atoms, the simplest atomic form of neutral antimatter. In this talk I will give an introduction to antimatter and its cosmological significance. Cold atoms of antihydrogen promise a unique opportunity to study the properties of atomic antimatter, and via comparisons with its well-studied matter-counterpart, the possibility to test fundamental symmetries such as CPT invariance. In order to probe matter-antimatter symmetry at the highest possible precision, it is essential that the anti-atoms be suspended in vacuum to allow for detailed interrogation via laser light or microwaves.

This presentation will describe the techniques ALPHA employs to synthesize antihydrogen, the evidence that it has been successfully trapped, the limits we obtain on its charge and gravitational mass, and our recent success in observing resonant microwave interactions with the antihydrogen atoms. Finally, I will offer an outlook towards the future spectroscopic studies that will be carried out on using the new apparatus that we are presently commissioning.

Wednesday, December 3, 2014
3:30 p.m.
Bob Wright Centre
Room A104