LABORATORY FOR ELEMENTARY-PARTICLE PHYSICS (LEPP)

B Exam

Wee Hao Ng

Advisor: **Yuval Grossman**

Revisiting hydrogen-antihydrogen oscillations in the interstellar medium

Hydrogen-antihydrogen (H-$\bar{H}$) oscillations are forbidden in the Standard Model of particle physics and hence represent signs of new physics. One way to detect such oscillations is via gamma-ray astronomy: in the interstellar medium (ISM), any H that oscillates into $\bar{H}$ may subsequently undergo annihilation with other atoms and hence produce gamma-rays. In this talk, I revisit the experimental bounds on these oscillations originally derived by Feinberg et al. (1978), using a more comprehensive theoretical framework, a multiphase description of the ISM, as well as recent gamma-ray data from the *Fermi* Large Area Telescope.

Tuesday, October 30, 2018
1:15 pm
401 Physical Sciences Building

LEPP, the Cornell University Laboratory for Elementary-Particle Physics, and CHESS resources have merged and a new lab, CLASSE, has formed. LEPP's primary source of support is the National Science Foundation. Visit us at www.lepp.cornell.edu.