



PHYSICS AND ASTRONOMY SEMINAR

Dr. Francesc Ferrer

Washington University

“Managing astrophysical uncertainties in dark matter detection”

Abstract

Save for its gravitational effects, very little is known about the composition of the dark matter in the universe. An attractive candidate for making up the dark matter is a weakly interacting massive particle (WIMP), that could be unveiled through its weak-scale interactions using two complementary approaches: direct and indirect detection. Although these programs have attained the sensitivity to probe the particle physics properties in a vast range of WIMP scenarios, they are hampered by uncertainties in the required astrophysical input. In this talk I will review our present understanding of the density and velocity distribution of the dark matter halo, and describe several efforts to constrain the WIMP scattering cross section using observables that are largely halo-independent. Finally, I will show that, by combining null results from direct detection experiments and neutrino telescopes, it is possible to set an upper limit on the scattering cross section independently of the velocity distribution.

Monday, March 14, 2016
1:00 p.m.
Clearihue Building
Room C108