

LNGS SEMINAR SERIES

Elena Aprile

Columbia University

The Amazing Liquid Xenon for Dark Matter WIMPs Detection

Cosmological observations and the dynamics of the Milky Way provide strong evidence for an invisible and dominant mass component, that so far reveals its presence only by its gravitational interaction. If the dark matter is made of Weakly Interacting Massive Particles (WIMPs), it can be directly detected via elastic scattering from nuclei in ultra-low background, deep-underground detectors. WIMPs arise naturally in beyond standard model theories, a popular example being the neutralino, or the lightest supersymmetric particle. After an introduction to dark matter and the direct detection method, I will introduce liquid xenon as used in the XENON Dark Matter project, located at the Gran Sasso Underground Laboratory. The new XENON1T experiment, in its final commissioning phase, will be the first to use thousands of kilograms of liquid xenon in a time projection chamber optimized for WIMPs detection. The experiment, expected to start data taking in early 2016, will open up a new era in dark matter direct detection, with two orders of magnitude better sensitivity than achieved to-date.

NOVEMBER 5, 2015 - 2:30 PM
LNGS - "B. PONTECORVO" ROOM