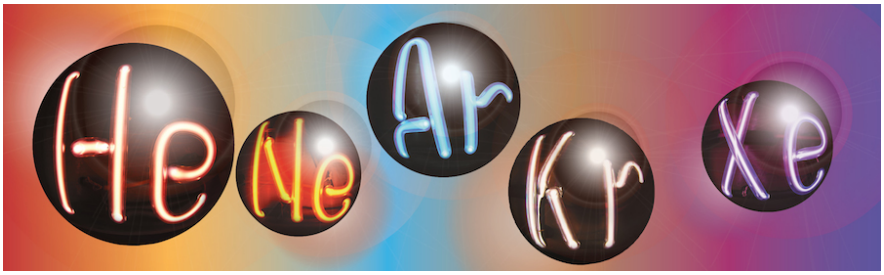

Contribution ID: **1** Type: **Presentation**

NEXT experiment: 0νββ search with High pressure Xe gas TPC

Sunday, 24 September 2017 11:25 (15 minutes)

The NEXT experiment seeks to discover the neutrinoless double beta decay (NLDBD) of Xe-136 using a high-pressure gas time projection chamber (TPC), filled with 100kg of enriched xenon, with electroluminesence (EL) gain and optical readout. This technology offers two features of great value in NLDBD decay searches: excellent energy resolution (<1% FWHM at the Q value of Xe-136) and event topology reconstruction to identify signal and background events. Furthermore, this technology can be extrapolated to large source masses, thus allowing the full exploration of the inverted-hierarchy region of neutrino masses.

In the NEXT detector, an array of photomultiplier tubes is located behind the TPC cathode and detects the EL light to provide a precise measurement of the total energy deposited in the gas. These PMTs detect as well the primary scintillation, which is used to mark the start of the event. On the opposite side of the detector, behind the anode, a dense array of silicon photomultipliers is used for track reconstruction.

The installation and commissioning of the NEXT-100 detector at the Laboratorio Subterráneo de Canfranc (LSC) is planned for 2019. Since October 2016, a first phase of the NEXT experiment, called NEW, is running with depleted Xe-136 at the Laboratorio Subterraneo de Canfranc (LSC). The NEW detector is a scale 1:2 in size of the NEXT-100 detector using the same materials and photosensors and will be used to perform a characterization of the NLDBD backgrounds and a measurement of the standard double beta decay with neutrinos. In this talk, I will introduce the plans to measure and understand the NLDBD backgrounds in NEXT using NEW data. In addition, I will present recent results on the characterization of the NEW detector performance using data from calibration sources.

Primary author: Dr LÓPEZ MARCH, Neus (IFIC)

Presenter: Dr LÓPEZ MARCH, Neus (IFIC)

Session Classification: Sunday Morning 2

Track Classification: Applications (dark matter, neutrino, precision frontier, medicine, etc.)