

Title: "Light Dark Matter Searches in Liquid Argon Time Projection Chamber"

"Exploring the potential of dark matter candidates with masses below  $10 \text{ GeV}/c^2$  is a promising avenue of research. In this presentation, we will discuss the world-leading results from our recent work, as published in three high-impact papers last year. These results focus on the searches of light-mass dark matter particles.

To enhance our sensitivity to light dark matter, it is imperative to improve our understanding of the liquid argon response to low-energy recoils. In pursuit of this goal, we are actively involved in the BLEND (Boron-10 Low Energy Neutron Detector) project, aimed at developing an efficient neutron detector for low-energy neutrons. In this presentation, we will present the progress made thus far and upcoming measurements planned for this December at ALTO, France.

Furthermore, we will delve into our ongoing researches, including an analysis of annual modulation in DarkSide-50, and a sensitivity study targeting light dark matter particles with DarkSide-20k, currently in the construction phase. Our presentation will highlight the significance of our collaboration between APC and AstroCeNT in advancing our understanding of dark matter and its potential impacts on the field of Astroparticle physics."