



Contribution ID: 50

Type: **not specified**

CYGNO: directional Dark Matter search with optical readout

We are going to present the project for CYGNO, a 1kg gaseous TPC Dark Matter directional experiment, to be hosted at Laboratori Nazionali del Gran Sasso. CYGNO (a CYGNus TPC with Optical readout) fits into the context of the wider CYGNUS collaboration, for the development of a Galactic Nuclear Recoil Observatory at the ton scale with directional sensitivity. The most innovative CYGNO's features will be the exploitation of sCMOS cameras and PMTs, coupled to GEMs amplification of an He:CF₄ gas mixture at atmospheric pressure. Compared to other optical approaches, these choices provide an improved signal/noise ratio, thanks to the 1-2 e⁻/pixel noise of sCMOS and high GEMs gains, combined with full 3D reconstruction, including head-tail, exploiting the large PMT signals. We will discuss the results of the Italian R&Ds with a 10 L detector prototype, demonstrating 3D tracking and background discrimination capabilities for O(100) keV nuclear and electron recoils, with O(100) μ m spatial resolution over 20 cm drift distance. We will conclude with the foreseen CYGNO-1kg experiment performances and preliminary sensitivity.

Primary author: BARACCHINI, Elisabetta (Gran Sasso Science Institute)

Presenter: BARACCHINI, Elisabetta (Gran Sasso Science Institute)