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## CYGNO – A 3D Optical Readout TPC for Directional Dark Matter Searches

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The CYGNO project has the goal to use a gaseous TPC with optical readout for low-energy directional Dark Matter search and solar neutrinos detection, providing a unique way to explore their nature.

The CYGNO demonstrator will consist of 1 m<sup>3</sup> active volume in 50 cm drift back-to-back TPC, filled with He-CF<sub>4</sub> gas mixture at atmospheric pressure, to be installed at the underground facilities of the Laboratori Nazionali del Gran Sasso (Italy). The unique combination of the TPC characteristics with the high-granularity sCMOS and fast sensors, used for reading out the light produced in the amplification stage (made of a triple-GEM structure), provides not only a detailed reconstruction of the event topology and energy, but also an excellent directional and head-to-tail capability. Thus, resulting in a promising particle identification / discrimination capability, essential to distinguish events taking place inside the active volume of the detector.

Thanks to its characteristics, CYGNO is expected to be sensitive to low mass dark matter (from 1 up to 10 GeV WIMP masses) with the potential to overcome the neutrino floor, that ultimately limits non-directional dark matter searches, pushing forward the frontiers of the knowledge in this area.

### Speaker

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