



Contribution ID: 92

Type: **not specified**

DarkSide-20k and the Liquid Argon Dark Matter Program

Monday 28 August 2023 15:50 (25 minutes)

The DarkSide program already produced leading results for both the low mass ($M_{WIMP} < 10\text{GeV}/c^2$) and high mass ($M_{WIMP} > 100\text{GeV}/c^2$) dark-matter direct-detection searches with its primary DarkSide-50 detector. Operating since 2013, DarkSide-50 was a 50-kg-active-mass dual-phase Liquid Argon Time Projection Chamber (TPC), filled with low radioactivity argon from an underground source. The next step of the DarkSide program consists the construction of a new generation experiment within the Global Argon Dark Matter Collaboration that engages all the current argon-based experiments. DarkSide-20k is designed as a 20-tonne fiducial mass dual-phase liquid argon TPC with SiPM-based cryogenic photosensors with high detection efficiency. The detector will be housed at the INFN Gran Sasso (LNGS) underground laboratory, just like its predecessor, and will be nearly free of any instrumental background for exposures of >100 tonne x year. DarkSide-20k is expected to attain a WIMP-nucleon cross-section exclusion sensitivity of $6.3 \times 10^{-48} \text{ cm}^2$ for a WIMP mass of $1\text{TeV}/c^2$ in a 200 t yr run. The talk will highlight the latest updates on the ongoing R\&D activities toward the construction of this large-scale argon detector and its capabilities.

Presenter: Dr WOJACZYNSKI, Rafal (National Centre for Nuclear Research Warsaw)

Session Classification: Parallel