

# Direct dark matter detection with the DarkSide experiment

*Monday 25 July 2016 18:00 (15 minutes)*

## Summary

The DarkSide program aims to directly search for dark matter underground at Gran Sasso National Laboratory in Italy. The core of the experiment consists of a dual-phase argon Time Projection Chamber (TPC) with which we are searching for WIMP induced nuclear recoils. The TPC is surrounded by a 30 tons liquid scintillator neutron veto and a 1000 tons water Cherenkov detector in order to reject background that can mimic a WIMP interaction. The current phase of the experiment, DarkSide-50, consists in a TPC filled with 50 kg of argon obtained from underground sources, which is significantly reduced in  $^{39}\text{Ar}$ . DarkSide-50 has made the most sensitive measurement of the  $^{39}\text{Ar}$  depletion in underground argon and performed a WIMP search using data from 70 live-days, setting the strongest limit to date on the WIMP-nucleon elastic scattering cross section with an argon target. These results demonstrated the power of the argon technology and the feasibility of DarkSide-20k, a bigger version of the current detector. Overviews of the recent science results, current status of the DarkSide-50 experiment and future development of the program will be presented.

## Based on (arXiv number)

**Author:** PAGANI, Luca (Università degli studi di Genova and INFN)

**Presenter:** PAGANI, Luca (Università degli studi di Genova and INFN)

**Session Classification:** Direct Dark Matter Detection

**Track Classification:** Direct Dark Matter Detection