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DarkSide latest results and the future liquid argon dark matter program

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DarkSide-50 is a dual-phase argon time projection chamber (TPC) with a 50 kg active volume that has been operating at the Gran Sasso National Laboratory (LNGS) since mid-2015. I will present the latest dark matter search results from this detector and their implications for a next-generation experiment, DarkSide-20k, a more than 20 tonne fiducial mass TPC equipped with SiPM-based photosensors. DarkSide-20k is expected to achieve an instrumental background well below that from coherent scattering of solar and atmospheric neutrinos and achieve exclusion sensitivity to a WIMP-nucleon cross section of 10^{-47} cm² for a 1 TeV WIMP in a 5 year run.

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