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The DarkSide-20k experiment

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The DarkSide-20k detector is currently under construction at the LNGS laboratory in Italy and is a crucial part of the Global Argon Dark Matter Collaboration's (GADMC) plan to probe the dark-matter parameter space down and into the neutrino fog. DarkSide-20k is a two-phase Time Projection Chamber with low-radioactivity acrylic walls and optical readout using Silicon Photomultipliers (SiPMs). The inner detector volume is nested in two veto detectors. Notably, DarkSide-20k will be filled with 50 tonnes (20 tonnes fiducial) of Underground Argon, minimizing the cosmogenically-produced background of Ar-39. Unique technical solutions have been developed to ensure excellent sensitivities for direct dark matter searches. We will discuss the design, implemented background reduction techniques, expected sensitivity, and the current status of DarkSide-20k

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