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## A dark matter direct detection search in DarkSide-20k

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The DarkSide-20k detector, currently under construction at the INFN Gran Sasso National Laboratory in Italy, consists of a 51 tonne dual-phase Liquid Argon Time Projection Chamber aiming to directly detect GeV – TeV mass WIMPs. WIMPs are one of the most promising dark matter candidates, but no direct detection experiment has yet observed evidence sufficient to claim a WIMP discovery. Therefore, the parameter space yet to be explored is the focus of next-generation detectors such as DarkSide-20k. Building on the successful use of underground argon in the DarkSide-50 detector, DarkSide-20k is designed to be free of instrumental backgrounds. It aims to achieve unprecedented sensitivity for direct dark matter detection of  $7.4 \times 10^{-48} \text{ cm}^2$  for 1 TeV/ $c^2$  WIMPs in a 200 tonne year exposure. Several novel technologies will be exploited, including the use of ultra-low radioactivity underground argon and large-area Silicon Photomultiplier readout. This talk will give an overview of the status of construction, discussing some of the novel technologies used in DarkSide-20k. This talk will also give an overview of the physics program of DarkSide-20k, highlighting recent low-mass sensitivity projections.

### Secondary track

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