

# Searching for sub-GeV particle dark matter with Spherical Proportional Counters

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**Abstract:** The NEWS-G collaboration is searching for light dark matter using spherical proportional counters. Access to 50 MeV to 10 GeV mass range is enabled by the combination of single electron threshold, light gaseous targets (H, He, Ne), and highly radio-pure detector construction. Most recently, new constraints on spin-dependent interactions of dark matter with protons were obtained with the commissioning data of a 140 cm in diameter spherical proportional counter, S140, constructed at LSM using 4N copper with 500  $\mu\text{m}$  electroplated inner layer. The detector currently operates in SNOLAB, with the first physics data-taking campaign recently completed. The latest physics results will be presented along with the recent developments on the detector instrumentation, namely individual read-out of the multi-anode sensor and electroformation techniques. The path towards DarkSPHERE, a large-scale spherical proportional counter fully electroformed underground at the Boulby Underground Laboratory will be discussed

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