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Low-mass Dark Matter Detection with the CRESST-III experiment

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CRESST (Cryogenic Rare Event Search with Superconducting Thermometers) is a direct dark matter search experiment, located at the Laboratori Nazionali del Gran Sasso (LNGS) in Italy, where an overburden of 1400m of rock (3800m water equivalent) provides an efficient reduction of the cosmic radiation background. In the CRESST experiment, ~24g scintillating CaWO₄ crystals are used as target material for elastic DM-nucleus scattering and operated as cryogenic detectors at ~15mK temperatures. The simultaneous measurement of the phonon signal from each target crystal and the emitted scintillation light in a separate cryogenic light detector provides event-by-event particle identification for background suppression. In 2018, the first run of CRESST-III was successfully completed, achieving an unprecedented low energy threshold for nuclear recoils of 30.1 eV. Such a low threshold provides a significant boost in sensitivity allowing to probe dark matter particle masses as low as $160 \text{MeV}/c^2$.

In this contribution the latest results of CRESST-III will be presented accompanied by a brief status update on the ongoing activities of the experiment.

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