CRESST: A direct search to probe (light) dark matter

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Today, many observations on various astronomical scales provide compelling evidence for the existence of dark matter. Its underlying nature, however, remains an open question of present-day physics.

Direct dark matter searches apply a great variety of different detector technologies, all aiming to observe dark matter particles via their elastic scattering off nuclei in their detectors.

One of the numerous experiments around the globe is CRESST-II, the only experiment using scintillating CaWO4 crystals as target material operated as cryogenic calorimeters at millikelvin temperatures. Each interaction in CaWO4 produces a phonon signal in the target crystal and also a light signal that is measured by a secondary cryogenic calorimeter. This technology is particularly sensitive to small energy deposits induced by light dark matter particles, allowing the experiment to probe the low-mass region of the parameter space for spin-independent dark matter-nucleon scattering with high sensitivity.

Recent results will be presented with sensitivity down to the sub-GeV/c^2 dark matter particle mass regime - a novelty in the field of direct dark matter detection.

Currently, CRESST-III is on its way, featuring detectors consequently optimized for the measurement of very small energy deposits to further explore the low-mass region. I will report on the status of the experiment and give an outlook on the anticipated sensitivity.