Corona-Update: ZOOM-Kolloquium

Kolloquium

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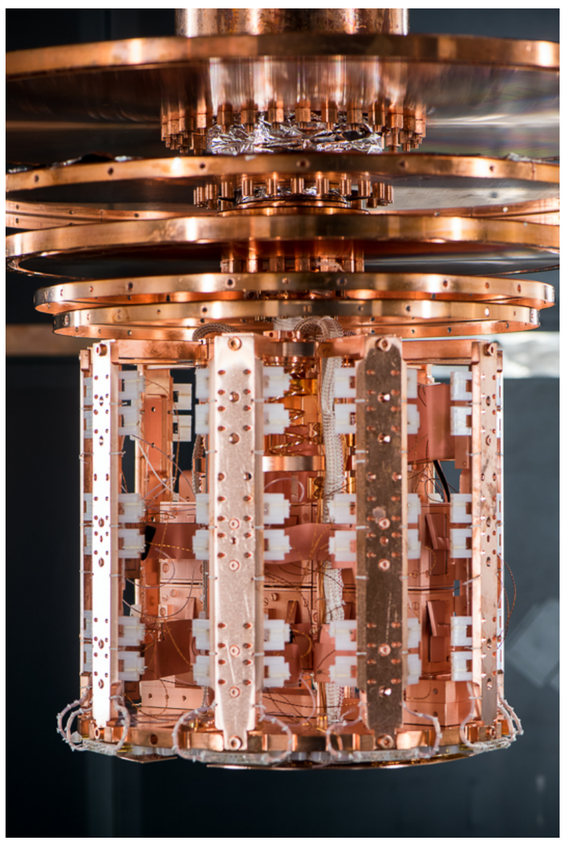
Search for low mass dark matter

physikalisches

Mo. 11.5.20
16:00 Uhr
go.ur.de/Koll

Well documented astronomical observations are widely interpreted as suggesting that a large fraction of the matter of the universe takes a form that is not contained in the standard model. Since this matter so far has escaped observations with traditional telescopes, it has been dubbed “dark” matter. The quest for the particle nature of dark matter is one of the big open questions of modern physics.

A well motivated candidate for dark matter (DM) is the so-called WIMP - a weakly interactive massive particle. Recently several theoretically well-motivated models with dark matter candidates in a mass region below the WIMP mass-scale gained also a lot of interest, theoretically and experimentally. The CRESST-III (Cryogenic Rare Event Search with Superconducting Thermometers) experiment is optimised for the detection of the elastic scattering of these low mass dark matter particles with nuclei and reaches the sub-GeV dark matter region. In order to achieve the required ultra-low background, the detector is surrounded by layers of radiopure shielding materials and installed at the deep-underground facility of the Laboratori Nazionali del Gran Sasso. With a new generation of CRESST detectors an ultra-low energy threshold of 30 eV has been achieved, which makes CRESST the leading experiment in sub-GeV dark matter searches.



The colloquium will give an overview of the experiment and present the latest DM data, which improved the sensitivity to spin-independent DM scattering down to masses of 160MeV/c^2. To reach dark matter masses in the MeV region different dark matter detection techniques have to be applied, like dark matter-electron scattering. A new experiment will be presented, called DANAE, based on RNDR-DEPFET silicon detectors being able to detect single electrons, which has the capability to measure dark matter down to few MeV.

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