

26. November 2021

Einladung zum Physikalischen Kolloquium

03.12.2021 **Sebastian Kempf, IMS, Karlsruher Institut für Technologie**
»Cryogenic quantum sensors – forefront technology for next-generation physics experiments«

Einführung: G. Drexlin

Advances in the understanding of nature very often goes hand in hand with progress in the development of detector instrumentation. In particular, cryogenic quantum sensors such as superconducting quantum interference devices (SQUIDs) or magnetic microcalorimeters (MMCs) have impressively proven to outperform conventional sensors up to several order of magnitude in performance, thus allowing to realize physics experiments that has been considered impossible so far. Well-known examples are the investigation of the electron neutrino mass by performing a calorimetric measurement of the energy released during the electron capture of Ho-163 or the recent measurement of the Th-229 isomer energy. Though great progress has already been made in recent years, the full potential of cryogenic quantum sensors has not yet fully exhausted. In particular, applications requiring ultra-high energy resolution or very large pixel counts still appear to be challenging. In this light, we summarize our recent progress regarding the development of cryogenic sensors with ultra-high energy resolution and SQUID based multiplexing techniques allowing the realization of large-scale cryogenic detector arrays. Moreover, we highlight some recent insights in the understanding of puzzling low-frequency noise sources existing in superconductor-based quantum devices.

Der Vortrag findet um 16:00 Uhr im Otto-Lehmann-Hörsaal, Physik-Flachbau (Geb. 30.22), statt. Bitte beachten Sie, dass das Betreten des Hörsaals nur unter Einhaltung der aktuell gültigen Landesregeln zum Infektionsschutz erlaubt ist.

Zusätzlich wird der Vortrag im Livestream angeboten:

<https://kit-lecture.zoom.us/j/69181919058>

Meeting-ID: 691 8191 9058

Kenncode: Physik