



EINLADUNG zum IFP-SEMINAR

The hunt for Dark Matter - puzzling events in cryogenic solid-state particle detectors

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Host: Karsten Held
Termin: Mittwoch, 29. Juni 2022, 16:00 Uhr CEST
Ort: Institut für Festkörperphysik, TU Wien
Wiedner Hauptstraße 8-10, 1040 Wien
Seminarraum DC rot 07 (roter Bereich, 7. OG)

Abstract:

We know from several observations that there is about five times more dark matter than ordinary matter. The origin of this additional dark matter is unknown and the subject of many different experiments. The joint working group at TU and HEPHY is a member of the CRESST experiment, which is leading the search for light dark matter. Cryogenic solid-state particle detectors are used by CRESST and other dark matter and neutrino experiments to measure low-energy particle interactions, down to nuclear recoil energies of $O(10)$ eV. Many of these experiments observe sharply rising event rates of yet unknown origin below a few hundred eV, and significantly compared to the expected known background. A number of observations, especially a decaying time dependency and the lack of consistency across runs, indicate that the excesses cannot be caused by a common particle recoil origin. The currently favored hypothesis includes micro-fractures in the target crystals, and similar effects, causing energy depositions of $O(1 - 100)$ eV. Due to the significant impact of these excesses on the physics reach of the experiments, a collective effort across ten world-leading experiments has been started to share the knowledge about the individual observations: the EXCESS workshop. The next workshop will take place in July, in Vienna. In our seminar talk, we summarize and discuss the conclusions of the previous workshops and questions for the workshop in Vienna.

Paper on Arxiv: <https://arxiv.org/abs/2202.05097>

Summary talk from the last

workshop: <https://indico.scc.kit.edu/event/2575/contributions/9670/>