10. Annual MT Meeting



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Transition Edge Sensors for Fundamental Physics

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Cryogenic detectors have become a great asset to fundamental science including astrophysics, particle physics, and materials science: These detectors promise extremely low noise as well as high efficiency and an unprecedented energy resolution compared to conventional semiconductor sensors. They are well suited for the detection of very low energy particles and are ideal sensors for searching for extremely rare events, such as those caused by the interaction of hypothetical axions or by a direct interaction with dark matter particles. We have been developing a program to characterize superconducting transition edge sensors (TES) and setting up TES systems optimized for rare event searches. This includes simulations to better understand the TES behavior and reduce background, as well as optimizing the analysis to increase the sensitivity for such searches. In the presentation, we will summarize the current status of the work, as well as available infrastructure, applications and plans. These include direct dark matter searches with our TES systems, a measurement of the even number photon distribution of a quantum-squeezed light source and an independent detection system to search for an axion signal at the ALPS II experiment.

Speed talk:

Presenter: JANUSCHEK, Friederike (DESY) **Session Classification:** Stream 3