

FAKULTÄT für PHYSIK
LUDWIG-MAXIMILIANS-UNIVERSITÄT
MÜNCHEN/GARCHING

PHYSIK-DEPARTMENT
TECHNISCHE UNIVERSITÄT MÜNCHEN
MÜNCHEN/GARCHING

MLL-KOLLOQUIUM

Donnerstag, 06.06.2019, 16¹⁵ Uhr

Hörsaal der LMU in Garching, Am Coulombwall 1
Treffen zum gemeinsamen Kaffee 16 Uhr

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(Physik Department E18, TUM)

Physics with Neutrons: from Dark Matter to Batteries

The question on the nature of dark matter is one of the major challenges of particle physics. So unsurprisingly, the recent suggestion of a dark decay channel as a solution to persisting discrepancies in measurements of the neutron lifetime initiated substantial research activity. In this presentation, we discuss the precision measurement of the parity violating beta asymmetry by PERKEO III. The result is about five times more precise than the current world average and resolves a long-standing discrepancy in the determination of the nucleon axial coupling. We derive a competitive value of the element V_{ud} of the CKM quark mixing matrix from neutron decay. With our results, we largely rule out the dark decay mode interpretation. Techniques developed for nuclear and particle physics also enable measurements relevant to the challenge of energy storage. Neutron depth profiling is a non-destructive method to quantify, e.g., the ${}^6\text{Li}$ content of battery anodes. We present the new N4DP setup at the MLZ and recent results.

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