

T 98: Hauptvorträge VII

Zeit: Freitag 9:00–10:30

Raum: H01

Hauptvortrag

T 98.1 Fr 9:00 H01

Recent developments in low energy neutrino physics: chances and challenges — ●WERNER MANESCHG — Max-Planck-Institut für Kernphysik, Saupfercheckweg 1, 69117 Heidelberg

Since their discovery in 1956 neutrinos have been extensively studied and used to reveal neutrino source properties as well as to search for physics beyond the Standard Model. Next to precision measurements of oscillation parameters in the existing standard 3-flavor framework, the key questions addressed nowadays are related to the absolute neutrino mass, the neutrino mass ordering and the existence of a CP violating phase. But also the search for the Majorana character of neutrinos, the existence of sterile neutrinos, of electromagnetic neutrino properties and non-standard quark-neutrino interactions are under investigation. This talk provides an overview about the most recent results in the low energy neutrino sector. A few experiments like Katrin, Borexino, Juno, Gerda, Stereo and Conus will be exemplarily used to demonstrate recent technological challenges and progresses, but also the rich physics program covered with very small to very large sized projects.

Hauptvortrag

T 98.2 Fr 9:45 H01

Gauge/gravity duality and particle physics: New approaches to strongly coupled sectors — ●JOHANNA ERDMENGER — In-

stitut für Theoretische Physik und Astrophysik, Julius-Maximilians-Universität Würzburg, Am Hubland, 97074 Würzburg

The AdS/CFT correspondence, which may be generalized to gauge/gravity dualities with running couplings, provides an important new map between quantum field theories (QFT) without gravity on the one hand, and gravity theories on the other. This is of intrinsic interest in view of a unified theory of fundamental interactions. In addition, gauge/gravity duality provides a new approach to strongly coupled QFT by mapping them to classical gravity theories. This has been used as a dual approach to confinement and chiral symmetry breaking, including the evaluation of meson and glueball masses and decay constants that compare favourably to lattice gauge theory results. Gauge/gravity duality has also proved very useful in the study of QCD at finite temperature and density. Currently, gauge/gravity duality is used as a road to new physics in the context of composite Higgs models, where the Higgs boson is viewed as an admixture of a pseudo-Goldstone boson and a condensate. Gauge/gravity duality allows to model the underlying strongly coupled gauge dynamics. The spectrum is determined by solving the equations of motion in the dual gravity theory. The talk will provide an overview over the main concepts of gauge/gravity duality and its use for beyond the standard model physics.