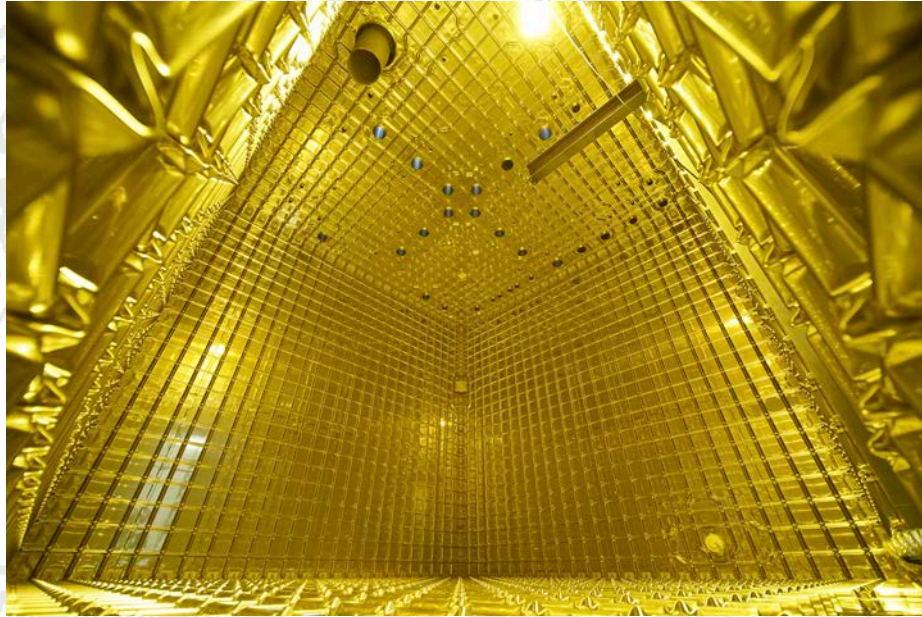


PHYSIKALISCHES KOLLOQUIUM

AM 22. JANUAR 2018 UM 17 UHR C.T.

IM GROßEN HÖRSAAL



THE ULTIMATE NEUTRINO EXPERIENCE

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The neutrino is one of the most fascinating elementary particles due to its very elusive nature and outstanding properties that have attracted the interest of physicists since 1930, when it was first postulated by Wolfgang Pauli as a “desperate remedy” to explain the apparent energy violation in the beta decay. To date, neutrino physics is still one of the hottest topics of modern particle physics. The Nobel Prize of 2015, jointly awarded to Kajita and McDonald for the discovery of neutrino oscillations, was just one milestone of a long series of events and scientific achievements that have marked the last 25 years of research, that contributed in building up what we can now call the Standard Model of neutrino physics.

The neutrino flavour and mass eigenstates mix and oscillate. The occurrence of oscillations implies that the neutrino is a massive particle like all other fermions, although with a much smaller mass. The mechanism that generates such low neutrino masses is still unknown but leads to strong hints for the existence of new physics beyond the Standard Model of particles and interactions. More important, there is still a long list of unknowns in neutrino physics that demand continued research efforts that will likely keep physicists occupied for several more decades. A vigorous neutrino program has been set up in the USA with the goal of clarifying most of these outstanding unknowns: all running and planned experiments have a powerful detection technique in common. The scene has been set for the ultimate neutrino experience...