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Particle Physics with neutrons and muons

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Modern particle physics operates at various so called frontiers. The most prominent today is the high energy frontier at which new particles may be directly generated by colliding very energetic particle beams. The reach of direct searches has in the era of the Large Hadron Collider at CERN entered the regime of TeV and so far in a most spectacular way corroborated the Standard Model of Particle Physics. A complementary approach is pursued at the precision frontier. Both, at high and at low energies indirect effects of new particles are being searched for in a selection of high-precision observables. While indirect, these searches often yield access to higher mass scales, sometimes to thousands of TeV. More and more particle physicists come to realize that efforts at all frontiers are required to build the large and consistent picture of fundamental physics. Some of the low energy observables stick out with unique reach. This is in particular true for searches for permanent electric dipole moments, providing some of our most stringent bounds on the CP symmetry between matter and antimatter, and for searches for charged lepton flavor violation. At the Paul Scherrer Institut in Villigen the highest intensities of low energy pions, muons and ultracold neutrons are used in experiments of this kind.