DÃ©partement de Physique NuclÃ©aire
SÉMINAIRE

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Vendredi 14/12/2018, 15h30-16h30

CEA Saclay, Orme des Merisiers Bat 703, p 45

ExpÃ©rience nEXO, neutrinoless double-beta decay

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Neutrinoless double-beta decay is generally recognized as one of the most powerful channels to access new physics beyond the Standard Model, with reach into lepton number violation and elementary Majorana fermions. The discovery of neutrino oscillations, indicating finite neutrino masses, has provided new impetus for its search, since the distinction between Dirac and Majorana properties is only observable if neutrinos are massive. Indeed, this also implies that the observation of the neutrinoless double-beta decay would provide an indirect probe on the absolute neutrino mass scale. In the last ten years, a number of experiments have come online, with active masses of the selected isotopes around 100kg, corresponding to half-life sensitivities in the 1025-1026 yr range.Â First among these experiments was EXO-200, which has achieved some of the longest half-life limits and demonstrated the power and scalability of the liquid Xenon technique for this kind of physics. Not having found the decay at those sensitivities, the field is gearing up for tonne-scale experiments and the nEXO collaboration has presented a full design report for a 5-tonne, enriched xenon experiment, with a sensitivity close to 1028 years and an upgrade path well beyond that.Â nEXO is also a low risk endeavor, because the required reduction in background mainly derives from the detector scaling laws, and not from assumption on purification of materials beyond what is currently demonstrable.Â Yet, nEXO is a state of the art detector, where all components and subsystems need to be superbly integrated together. The procurement of 5000kg of xenon enriched to 90At this exciting time, I will describe the nEXO detector that has become the flagship double-beta decay project in the US and North America.

Le cafe sera servi 10 minutes avant
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