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# The SNO+ Science Programme: Input to the European Strategy for Particle Physics - 2026 Update

The search for neutrinoless double beta decay ($0\nu\beta\beta$) is considered by the community as one of the most important topics in neutrino physics and as a priority by successive updates of the European Strategy for Particle Physics. An understanding of the nature of neutrino mass is connected to the charge conjugation nature – Dirac or Majorana – of neutrinos. An observation of $0\nu\beta\beta$ would prove that neutrinos are Majorana particles, demonstrate lepton number violation, and have profound implications on cosmology and physics at higher energy scales. The SNO+ experiment has pioneered the techniques to purify and load large quantities of natural tellurium into liquid scintillator and is getting ready to start a high sensitivity search for the $0\nu\beta\beta$ of $^{130}Te$. Reusing the Sudbury Neutrino Observatory detector, SNO+ has been operating with 780 tonnes of liquid scintillator since 2022, characterizing all the detector and scintillator-related backgrounds. Using Tellurium that has "cooled" underground for several years, the initial loading is planned to start in 2026 and is expected to reach a world-leading $0\nu\beta\beta$ sensitivity for $^{130}Te$. The collaboration is actively seeking funding for an additional 7.8 tonnes of tellurium and upgrades to the underground plants in order to pursue a 1.5\% loading phase, expected to reach the bottom of the inverted mass hierarchy for some nuclear matrix elements and potentially leading sensitivity for any isotope. The exceptional location of SNOLAB and low backgrounds of the detector will continue to be exploited for solar, reactor and geo-neutrinos. SNO+ is a CERN recognized experiment and European groups have been founding members of the collaboration and have a significant impact on SNO+, making central contributions to the development of the tellurium purification and loading techniques, to data analysis and calibration.

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