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The SNO+ experiment: current status and prospect

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The SNO+ experiment is a multi-purpose neutrino detector located 2 km underground at SNOLAB in Vale's Creighton Mine in Sudbury, Ontario. The centerpiece of SNO+ is a 12-m diameter acrylic vessel, containing the target medium. The acrylic vessel is surrounded by 7 kilotonnes of ultrapure water shielding and about 9300 photomultiplier tubes. SNO+ is operating in three phases, defined by the target medium: water, scintillator, and scintillator loaded with tellurium. In the water phase, SNO+ has collected ultra-low background data, confirmed previous measurements of solar neutrino flux, and set world-leading limit on invisible modes of proton decay of 3.6×10^{29} years. Utilizing an Americium-Beryllium neutron calibration source, SNO+ has measured the highest neutron detection efficiency for pure water Cherenkov detectors and this rate will inform physics analyses, such as the antineutrino search.

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