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Status, plans, and physics potential of the Hyper-Kamiokande experiment

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Hyper-Kamiokande is a next-generation underground water Cherenkov detector currently under construction in Japan. Thanks to a fiducial volume more than eight times larger than that of the currently operating Super-Kamiokande, and enhanced detection capabilities, Hyper-Kamiokande is expected to significantly surpass the sensitivities of its predecessors, Super-Kamiokande and T2K.

The project offers a comprehensive and ambitious science program. The experiment will investigate neutrino oscillations, using neutrinos from both natural sources - such as the Sun and cosmic ray interactions in the Earth's atmosphere - and an upgraded, intense neutrino beam produced at J-PARC, for which Hyper-Kamiokande will serve as the far detector. In addition, the experiment will explore neutrinos from astrophysical sources, including galactic core-collapse supernovae and the diffuse supernova neutrino background (relic supernova neutrinos). Hyper-Kamiokande will also conduct searches for rare processes such as proton decays.

The talk will provide an overview of the Hyper-Kamiokande experiment, including its design, physics goals, projected sensitivities, and current status.

Secondary track

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