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The IceCube Neutrino Observatory and future extensions

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The IceCube Neutrino Observatory, located at the South Pole is the world's largest optical neutrino telescope instrumenting a total of 1 km^3 of glacial ice with more than 5000 sensors. After more than a decade of data taking, IceCube has revealed the high-energy astrophysical neutrino flux, identified sources of high-energy neutrinos, probed beyond the standard model and fundamental neutrino physics and contributed to low-energy and supernova science. In addition, the IceCube Upgrade to be completed in the 2025/26 season will deploy about 700 new sensors in a dense detector infill aimed at improving detector calibration, lowering the energy threshold for a subset of the detector and acting as a testbed for newly developed sensors. IceCube-Gen2, an envisioned large-scale extension of IceCube, will increase the instrumented volume by a factor of 8. In this talk, I will give an overview of the latest results from IceCube, summarize the research fields of the Uppsala and Stockholm groups and demonstrate the Swedish hardware contributions.

Summary

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