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Exploring the Universe with High Energy Neutrinos

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The age of high energy neutrino astronomy has arrived, and the Universe has begun to reveal its secrets. IceCube has detected and characterised the astrophysical neutrino flux, and revealed evidence of the first source –the blazar TXS 0506+056 –which appears to be a cosmic particle accelerator. Upgraded and new detectors (IceCube Upgrade, KM3NET, IceCube-Gen2) are in various stages of planning and construction, and will further improve the sensitivity to steady point sources and transient emissions. Present and future detectors are also excellent laboratories for tests of fundamental physics using the high fluxes of atmospheric neutrinos that form the backgrounds to the astrophysical observations.

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