

IceCube: Particle Astrophysics with High-Energy Neutrinos

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Construction and commissioning of the IceCube kilometer cube neutrino detector and its low-energy extension DeepCore have been completed. The instrument detects neutrinos over a wide energy range: from 10 GeV atmospheric neutrinos to 10^{10} GeV cosmogenic neutrinos. We will discuss initial results based on a subsample of the $\sim 100,000$ neutrino events recorded during construction. We will emphasize the first measurement of the high-energy atmospheric neutrino spectrum and the prospect for Earth radiography, the search for the still-enigmatic sources of the Galactic and extragalactic cosmic rays and for the particle nature of dark matter.