

IceCube: Opening a New Window on the Universe from the South Pole

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The IceCube project has transformed a cubic kilometer of natural Antarctic ice into a neutrino detector. The instrument detects more than 100,000 neutrinos per year in the GeV to PeV energy range. Among those, we have isolated a flux of high-energy cosmic neutrinos. I will discuss the instrument, the analysis of the data, the significance of the discovery of cosmic neutrinos, and the recent multimessenger observation of a flaring TeV blazar in coincidence with the IceCube neutrino alert IC170922. The large cosmic neutrino flux observed implies that the Universe's energy density in high-energy neutrinos is the same as that in gamma rays, suggesting that the sources are connected and that a multitude of astronomical objects await discovery.

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