IceCube - The Neutrino Observatory at the South Pole

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Neutrinos are unique cosmic messengers because they are neither appreciably attenuated by matter nor deflected by magnetic fields. Active galactic nuclei, gamma ray bursts, exotic particle decays, and cosmic rays interacting with the cosmic microwave background are all potential sources of ultra-high energy neutrinos. To detect the very low fluxes expected from these sources, we require the largest neutrino detector ever built: IceCube, a cubic-kilometer array located near the geographic South Pole.

IceCube currently consists of 40 strings with 60 digital optical modules per string, deployed between 1500 and 2500 meters deep in the Antarctic ice. Each string is complemented by 2 air-shower detection tanks on the surface. The final detector, scheduled for completion in 2011, will contain 80 strings instrumenting a volume of 1 cubic kilometer. IceCube includes its predecessor, the AMANDA array, which has been fully operational since 2000. I will review the latest science results from AMANDA and the status and science capabilities of the full IceCube detector.