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Neutrino Astronomy

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A giant kilometer scale telescope called IceCube is now operating at the geographic South Pole to catch one of the most elusive known particles in nature, Neutrinos. Because of feeble interactions of neutrinos with matter, Neutrino Telescopes need to be big to catch them from Galactic and extragalactic astrophysical objects. Neutrino Astronomy is still in its infancy with the Sun and the supernova 1987A being the only two detected sources. But their detection revealed the inner working of the Sun's core and the supernova explosion mechanism that are inaccessible to optical telescopes. High-energy neutrinos are produced by interactions of cosmic rays. Cosmic rays, being charged particles, are deflected in the galactic and extragalactic magnetic field and lose their directional information. Thus the sources of cosmic rays are still mysterious. Recent detection of dozens of high-energy neutrinos by IceCube provides the first opportunity to solve this mystery. I will give an overview of the Neutrino Telescopes, the candidate astrophysical sources of neutrinos and the current status of the field.

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