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Exploring the Cosmic Frontiers: IceCube's Update on Neutrinos and Cosmic Rays

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The IceCube Neutrino Observatory detects particles produced from cosmic rays and neutrinos to explore the high-energy universe. The deep in-ice array consists of 5160 light sensors instrumenting a cubic kilometer of South Pole ice at depths between 1.5 and 2.5 kilometers measuring high-energy neutrino interactions and PeV muon bundles from cosmic ray air showers. The deep detector is complemented by IceTop, a square kilometer surface detector directly above the in-ice array. IceTop enables a wide range of cosmic ray science and serves as a veto for identifying neutrino events. An overview of recent results from IceCube and IceTop will be presented, including recent results about high-energy neutrino sources as well as updates on the measurement of the high-energy cosmic ray flux, mass composition and anisotropy. Additionally, an outlook on the planned high-energy extension IceCube-Gen2 will be given as well.

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