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High-Energy Neutrinos

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With the recent discovery of high-energy neutrinos of extraterrestrial origin by the IceCube neutrino observatory, neutrino astronomy is entering a new era. The highest energy neutrinos observed to date exceed 1 PeV in energy, a regime of particular interest because the neutrinos should point back to the still elusive accelerators of the highest energy Galactic and extragalactic cosmic rays. This review will cover currently operating high-energy neutrino detectors in water and ice, the latest results from searches for a flux of extraterrestrial neutrinos, current efforts in the search for steady and transient neutrino point sources and the exciting physics program these detectors offer in studies of atmospheric neutrinos and indirect searches for dark matter. In addition, current and future detector upgrades such as KM3NeT in the Mediterranean Sea and "IceCube-Gen2"/PINGU will be discussed.

Author: KOPPER, Claudio (University of Alberta)

Presenter: KOPPER, Claudio (University of Alberta)

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