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Recent Results in High-Energy Neutrino Astrophysics

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Seven years ago, IceCube reported the observation of an isotropic flux of astrophysical neutrinos in the TeV-PeV energy range. While the flux has now been reported with several methods and with high significance, the nature of the neutrino sources remains unclear. More recently IceCube has identified the first very-high-energy neutrino source candidate: the blazar TXS 0506+056. But it is not obvious that blazars are the dominant contributor to the observed flux. The dearth of clearly identifiable neutrino point sources may indicate that the observed flux is dominated by a large number of relatively weak extra-galactic objects. Moreover, it's plausible that the very-high-energy neutrino sky is complex and several astrophysical classes contribute to the observations. In this presentation I will summarize the current status of astrophysical very high energy neutrinos. I will discuss current efforts to identify very-high-energy neutrino sources with an emphasis on the multi-messenger approach. I will review currently operating instruments: ANTARES and IceCube. And will review the prospects for future instruments: IceCube-Gen2 and KM3Net.