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All-Sky High-Energy Neutrino Sources Searches with IceCube

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Searches for astrophysical neutrino point-sources in IceCube have been performed for over a decade. IceCube has two data streams; track-like and cascade-like events. Historically the track-like stream was utilized for these searches, producing observations of the first astrophysical neutrino sources such as NGC 1068 and TXS 0506+06. Cascade-like events were utilized to observe the Galactic Plane in neutrinos for the first time. These recent astrophysical results from the past decade will be reviewed in this talk. Recently, we performed a unified point-source search that incorporates track-like dataset and cascade-like dataset for the first time using a maximum-likelihood framework which can account for differences in signal and background distributions, energy resolutions, and data rates across both datasets. By combining these complementary all-sky samples, we achieve improved sensitivity in the southern sky, with each event type contributing where the other is limited. Using 14 years of track data and 10 years of cascade data, we obtain the most sensitive IceCube all-sky point-source search to date, the results of which will be presented.

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