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IceCube: The First Decade of Neutrino Astronomy

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“The discovery of an unexpectedly large flux of extragalactic neutrinos revealed that cosmic neutrinos are produced in environments from which accompanying gamma rays from neutral pion decay escape with significant loss of energy, to appear below the threshold of the NASA Fermi gamma ray satellite. IceCube also isolated a flux of neutrinos from our own Galaxy, which is not a dominant feature of the neutrino sky unlike what is observed for all wavelength of light. Cosmic ray accelerators must exist in other galaxies that are not present in our own, possibly the active supermassive black hole. The discovery of the galaxy NGC 1068 and other such sources confirmed the scenario where neutrinos are indeed produced in the dense gamma-ray obscured cores of active galaxies. Finally, we speculate that similar neutrino processes are characteristic of the accreting black holes in Galactic X-ray binaries, despite of their different masses and physical sizes.”

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