The hunt for cosmic accelerators with high energy neutrinos

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IceCube instruments a gigaton volume of the deepest and cleaner South Pole ice. It has been taking data in full configuration since Spring 2011 with a duty cycle of about 99% and has observed, for the first time, a flux of high energy astrophysical neutrinos. A purely atmospheric explanation of these events is disfavored at the > 5σ level. The observations are well explained by a single all-sky isotropic astrophysical neutrino component (Isotropic Neutrino Emission). I will discuss in this colloquium the astronomical observations, the phenomenology and, to a certain extent, the theoretical modeling of candidate counterparts of the Isotropic Neutrino Emission. The astrophysical emphasis will be on blazars, a sub-class of Active Galactic Nuclei.