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Searches for High Energy Astrophysical neutrinos: recent results, world-wide perspectives

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The primary goal of a Neutrino Telescope is the search for astrophysical neutrinos in the TeV-PeV range. Several experimental activities have been developed aiming at the operation of a High Energy Neutrino Telescope: a detector sensitive to the Cherenkov light originated by the propagation, in a transparent medium, of relativistic charged particles generated by neutrino interactions. In the Baikal Lake (Siberia), at 1000m depths, a pioneer detector has been operated since 1990. In the last two decades the IceCube Detector, located at ~2000 m depth into the South Pole ice, and the ANTARES detector, anchored at 2400m depth in the Mediterranean Sea, have used the ice, and the sea water respectively, as transparent media where a matrix of photosensors, disposed according to well defined geometries, can measure the Cherenkov light. IceCube dimensions (about 1km3 of instrumented volume) exceed by about two order of magnitude the ANTARES ones. This last detector can be considered as the precursor of KM3NeT, the Mediterranean neutrino Telescope with cubic kilometre dimensions at present under construction. I will describe how neutrino astronomy can improve, in a multi-messenger scenario, our knowledge of the highest energy sources of cosmic rays, I will describe the most recent results obtained by existing detectors and the perspectives for the future.

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Classifica Sessioni: Multi-messenger science potential with current and future detectors