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ANTARES and KM3NeT neutrino Telescopes : Status, Results and Perspectives

The ANTARES underwater neutrino telescope, located in the Mediterranean Sea off the coast of Toulon (France), has been continuously taking data since 2007 with the primary aim to detect astrophysical neutrinos in the TeV–PeV range. The optical properties of the deep-sea water allow for a large effective area and good pointing accuracy in all neutrino flavor channels, leading to an unprecedented sensitivity in the searches for neutrino sources in the Southern Sky and in the energy range below 100 TeV. This has allowed, in particular, to constrain the origin of the cosmic neutrino flux discovered by the IceCube detector. In the context of multi-messenger astronomy, the ANTARES data are used to search for neutrino emission from transient sources. Among these are searches for neutrino correlations with transient events detected at different wavelengths, gravitational wave events, and neutrino events detected by the IceCube observatory. Many other physics topics are also covered by ANTARES: searches of dark matter annihilation or decay in massive objects; the search for relic massive magnetic monopoles and nuclearites; the study of atmospheric neutrinos and neutrino oscillations. An overview of the latest results from all these analyses in ANTARES will be discussed.

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