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KM3NeT - The next-generation neutrino telescope in the Mediterranean

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KM3NeT is a multi-site, deep-sea research infrastructure being constructed in the Mediterranean Sea. It will comprise the next generation neutrino telescope and it will offer the opportunity of a variety of multi-disciplinary, real-time measurements. The apparatus will be equipped with a large number of digital optical modules (DOMs), each equipped with 31 PMTs of 3”photocathode, arranged on flexible detection units (DUs). The DUs are deployed on the sea bottom in a compact configuration and are left free to reach their unfurled shape after installation. Two configurations of DUs, each comprising 18 DOMs, have been considered: in the tallest configuration, the spacing between DOMs is of 36 m, for a total height of a DU exceeding 700 m; alternatively, the DOMs can be mounted with a spacing as small as 6 m, allowing to build a detector optimized for lower energies as needed for neutrino mass hierarchy investigations. KM3NeT 2.0 comprises the installation of 230 such units, optimized for high-energy neutrino astrophysics, at a depth of 3500 m offshore Sicily, plus 115 DUs, in the lower-energy configuration, at 2500 m depth offshore Toulon, France (respectively: the ARCA and ORCA projects, i.e. Astroparticle and Oscillations Research with Comics in the Abyss). Following the successful installation of prototypes in the past two years, construction of the first core of the apparatus has started. The technological solutions for KM3NeT and the expected performance will be presented.

Collaboration

The KM3NeT Collaboration (http://www.km3net.org)

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