

# The KM3NeT Neutrino Observatory - Status and Perspectives

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KM3NeT is an international collaboration constructing the future km<sup>3</sup>-scale deep-sea neutrino observatory on two abyssal sites in the Mediterranean: ARCA, near Capo Passero in Sicily (Italy) and ORCA, near Toulon (France). Detection arrays in such sites rely on a novel design for their Digital Optical Modules, housing 31 three-inch photomultiplier tubes enclosed in a glass sphere, which provide enhanced photon counting and directionality performances. The discovery and subsequent observation of high-energy neutrino sources in the Universe and the determination of the mass hierarchy of neutrinos are the two major goals of KM3NeT.

ARCA (sparser layout of KM3NeT) is optimised to observe and measure high-energy neutrinos (above 100 GeV) of astrophysical origin with unprecedented angular resolution and sensitivity. It will provide an optimal view of the Southern sky, including the Galactic Center. Projections for ORCA (denser layout of KM3NeT) suggest  $\sim 2.5-5\sigma$  sensitivity on the neutrino mass ordering after 3 years of exposure with the full layout. Sensitivity measurements to neutrino oscillation parameters as  $\Delta m_{32}^2$  and  $\sin^2 \theta_{23}$  and tau-neutrino charged-current normalisation will be possible during ORCA construction. The P2O proposal to shoot a long-baseline neutrino beam from the Protvino (Russia) accelerator to ORCA could also open new perspectives that will be briefly addressed in this contribution.

The first Detection Units have been deployed in the French and Italian sites. Selected results based on first data will be presented, together with the status and the science perspectives of the project.