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KM3NeT: From the Cosmos to the Sea

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Neutrinos are interesting elusive particles that can tell us much about our Universe. Due to their neutral, stable, and weakly interacting nature, neutrinos are valuable for studying various astrophysical phenomena including supernovae, solar flares, neutrino oscillations, and dark matter. However, neutrino fluxes at high energies are very small making critical the possibility of having very large detectors. The KM3NeT collaboration will meet this requirement by building two neutrino telescopes to investigate phenomena from the GeV to the PeV energy ranges. These two experiments are called ARCA (Astroparticle Research with Cosmics in the Abyss) and ORCA (Oscillation Research with Cosmics in the Abyss), and they are located in Sicily (at a depth of 3500m) and Toulon (at a depth of 2500m), respectively. ARCA is designed to detect high-energy astrophysical neutrinos whilst ORCA is optimised for less energetic neutrinos, giving this way, a comprehensive understanding of cosmic energies.

ARCA and ORCA consist in multi-PMT modules carefully studied and assembled in several integration sites all over Europe and Morocco. The module design provides excellent resolution capabilities, position and time calibration.

This talk aims to give an overview of KM3NeT telescopes technology, construction processes and calibration.

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