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KM3NeT: Deep-sea Neutrinos

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KM3NeT (Kilometer Cube Neutrino Telescope) is a European research infrastructure currently under construction in the Mediterranean Sea, with two main sites: ARCA (Astroparticle Research with Cosmics in the Abyss), located off the coast of Capo Passero, Sicily, and ORCA (Oscillation Research with Cosmics in the Abyss), off the coast of Toulon, France. Its primary goal is the study of high-energy neutrinos, both for astrophysical purposes and for fundamental physics.

The infrastructure consists of a three-dimensional array of Digital Optical Modules (DOMs), anchored to the seafloor at depths exceeding 2500 meters. To support detector calibration, KM3NeT is equipped with an advanced network of acoustic sensors. Oceanographic and environmental sensors, including hydrophones and instruments for measuring temperature, pressure, and salinity are also present.

This instrumentation makes KM3NeT a strategic platform for the development of multidisciplinary activities, particularly in the fields of marine biology and oceanography. The acoustic sensors, for instance, enable monitoring of the presence and behavior of cetaceans and other marine species, while the continuous acquisition of environmental data is highly valuable for studying deep-sea ecosystems.

The presentation will provide an overview of the detector architecture, the main scientific objectives of KM3NeT along with an overview of the VHE neutrino event detected in February 2023, and current collaborations with marine research institutions.

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Session Classification: La Fisica e il Mare: conoscere, navigare, esplorare / Physics and the Sea: Knowing, Sailing, Exploring