



Contribution ID: 23

Type: **Contributed Talk**

The KM3NeT Digital Optical Module: a multi-PMT approach

Thursday, October 2, 2025 10:10 AM (20 minutes)

The KM3NeT Collaboration is deploying an advanced deep-sea neutrino detector in the Mediterranean Sea, aiming to explore neutrinos across a broad energy spectrum. This is achieved through two detectors, ARCA and ORCA, that share the same Cherenkov detection principle, but differ in their geometrical layout to address distinct physics goals. A central component of KM3NeT is its novel Digital Optical Module (DOM), which features 31 three-inch photomultiplier tubes within a single pressure-resistant glass sphere. This multi-PMT configuration marks a significant advancement over traditional single-PMT designs, offering a larger effective photocathode area and enabling superior timing accuracy, directional resolution, and calibration capabilities. To meet the demands of large-scale deployment (6210 DOMs are foreseen in total for the full-size detectors), the DOMs are assembled simultaneously at eight different integration sites using a rigorously standardized process. This talk will give an overview of the KM3NeT optical module technology and the integration strategy adopted to support large-scale deployment.

Neutrino Properties

no

Neutrino Telescopes & Multi-messenger

no

Neutrino Theory & Cosmology

no

Data Science and Detector R&D

“Topics include technological developments in detector systems”: the KM3NeT multi-PMT module

Author: Dr REA, Immacolata Carmen (Istituto Nazionale di Fisica Nucleare)

Presenter: Dr REA, Immacolata Carmen (Istituto Nazionale di Fisica Nucleare)

Session Classification: Data Science and Detector R&D

Track Classification: Neutrino Telescopes & Multi-messenger