

**ERASMUS MUNDUS MASTER IN NUCLEAR PHYSICS**  
Academic Year 2024/2025

**MASTER THESIS PROPOSAL**

**TITLE:** Monitoring data quality for the KM3NeT experiment

**SUPERVISOR(S):** Chiara Lastoria, Benoit Guillon

**SUPERVISOR(S) contact- email:** lastoria@lpccaen.in2p3.fr  
email: guillon@lpccaen.in2p3.fr

**Telephone:**  
**Telephone:**

**UNIVERSITY/RESEARCH CENTER:** LPC Caen

**ABSTRACT**

(just few lines 5-10 explaining briefly the idea of the proposed work and the place where it will be developed).

The KM3NeT experiment is a cutting-edge water Cherenkov neutrino telescope under construction in the Mediterranean Sea in two detector sites: ORCA and ARCA. The different volume of the two detectors allows the experiment to cover a wide physics program going from precise measurement of neutrino oscillation parameters in the 1-100~GeV range to neutrino astronomy in the TeV-to-PeV energy scale. Although its installation realization is foreseen in 2028, its modular structure allows for the unique opportunity to analyze real data for physics studies since the construction phase. To accomplish its physics goals, ensuring high-quality data is essential. In this internship, we offer the possibility to perform statistical tests via data-Monte Carlo and data-data comparisons to optimize data quality across the various geometries. In particular, we propose to develop standalone tools to monitor the data-quality progression to be integrated into the official framework used within the Collaboration.