

# Probing the absolute neutrino mass scale with $^{163}\text{Ho}$ : the **HOLMES** project.



The HOLMES project aims to directly measure the neutrino mass using the  $e^-$  capture decay (EC) of  $^{163}\text{Ho}$  down to the eV scale. It will perform a precise measurement of the end-point of the Ho calorimetric energy spectrum to search for the deformation caused by a finite electron neutrino mass. The choice of  $^{163}\text{Ho}$  as source is driven by the very low Q-value of the EC reaction, which allows for high sensitivity with low activities ( $O(10^2)\text{Hz/detector}$ ), thus reducing the pile-up probability. A large array made by thousands of TES based micro-calorimeters will be used. The calorimetric approach eliminates systematic uncertainties arising from the use of an external beta-source, and minimizes the effect of the atomic de-excitation process. The commissioning of the first implanted sub-array is scheduled for the end of 2018. It will provide useful data about the EC decay of  $^{163}\text{Ho}$  together with a first limit on neutrino mass. In this presentation the current status of the main tasks will be summarized: the TES array design and engineering, the isotope preparation and embedding, and the development of a high speed multiplexed SQUID read-out system for the DAQ.

