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## The ECHo neutrino mass experiment

The Electron-Capture- $^{163}\text{Ho}$  experiment, ECHo, aims to investigate the electron neutrino mass in the sub-eV range by means of the analysis of the calorimetrically measured electron capture spectrum of  $^{163}\text{Ho}$ . Arrays of low temperature metallic magnetic calorimeters having the  $^{163}\text{Ho}$  source embedded in the absorber will be used for the measurement of the spectrum. A precise description of the expected spectrum will be achieved by theoretical calculations in parallel with dedicated experimental investigations. Independent measurements of the QEC-value will be performed using high precision Penning traps. For the QEC measurements as well as for the calorimetric measurement of the  $^{163}\text{Ho}$  spectrum, high purity  $^{163}\text{Ho}$  sources will be produced. Detailed studies of the background and of methods to reduce it will be performed in order to increase the sensitivity of the calorimetric measurement to the effect of a non-zero electron neutrino mass.

A pilot experiment consisting of about 100 detectors grouped in arrays which are read out with the microwave multiplexing technique is under preparation. The activity per pixel will be between 1 and 10 Bq. With one year of measuring time the ECHo experiment will be able to improve the limit on the electron neutrino mass by one order of magnitude.

### Summary

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