The LUCIFER project: a scintillating bolometer array to search for Neutrinoless Double Beta Decay

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The quest for Neutrinoless Double Beta Decay (0ν0β) represents the most promising way to assess the neutrino mass nature, Dirac or Majorana.

The LUCIFER project, financed by an ERC-AdG, aims to search for 52Se 0ν0β by means of an array of ZnSe scintillating bolometers. As in other rare process searches, the greatest obstacle to improve the experimental sensitivity is the achievable background level. The simultaneous read-out of heat and scintillation light signals allows to discriminate between a background and β/γ's, providing a background lower than 0.01 counts/kg/keV/year in the ROI.

The use of 52Se enriched crystals will provide an additional improvement of the sensitivity.

The current status of LUCIFER project as well as the recent results of R&D on ZnSe crystals are presented.