Theoretical postdoc position at LNS

The Italian National Institute for Nuclear Physics (INFN) invites applications for one postdoc position in Theoretical Physics to work within the theory group in LNS-Catania on the subject

"Theoretical description of charge-exchange and transfer nuclear reactions:
towards the matrix elements of double-\beta decay".

This research activity is strongly supported by the INFN, in the context of the "What next" programme and will closely follow the new experimental NUMEN project, which has just started at LNS.

The theoretical aspects will be carried out also in collaboration with Prof. Horst Lenske (University of Giessen).

A brief illustration is given at the end ot this announcement.

The position is for one year (renewable for another year) and it is offered to canditates with considerable experience on direct reaction theory.

The starting date of the position should be around Spring of 2016, with some flexibility. The net salary will be about 2500 Euros per month.

Candidates are kindly invited to contact Dr.Maria Colonna (colonna@lns.infn.it) as soon as possible, sending a CV and (if available) two reference letters, to express their interest and receive further details concerning the application procedures.

Sincerely yours,

Dr.Maria Colonna
INFN First Researcher
INFN-LNS, Catania (Italy)

Double Charge Exchange (DCE) reactions are the object of a worldwide renewed interest, also for the information that one could extract on the nuclear matrix elements entering the expression of the life time of the double \beta decay.

This possibility is essentially based on the coincidence of the initial and final state wave-functions in the two classes of processes and the similarity of the transition operators, which in both cases present a given superposition of Fermi, Gamow-Teller and rank-two tensor components with a relevant implicit momentum available.

An intense experimental activity on DCE reactions is planned at the LNS-Catania, according to the NUMEN project.

The aim of the proposed research activity is to work on the development of theoretical tools to deal with the description of DCE reactions and competitive processes.

A central point of the analysis would be the comparison to the available experimental data and the identification of the the experimental conditions more suitable to extract, by comparison with the model predictions, the nuclear matrix elements of the DCE process.

We also aim at investigating the analogy between the theoretical description of the neutrino-less double \beta decay, and of DCE reactions, to evidence differences and similarities between the two processes, and identify the information that can be extracted, from the study of nuclear reactions, on the double \beta decay.