



Laboratori Nazionali del Gran Sasso

# Neutrino Physics and Astrophysics with Borexino at Gran Sasso

A seminar by

**Gianpaolo Bellini**

Professor Emeritus at Milano University  
Emeritus Scientist of INFN

## Abstract

The results obtained with Borexino and their impact on the Solar and neutrino physics are summarized. In particular about the solar physics, the experiment has shown that the Sun shines via the proton-proton nuclear reaction chain and is stable on  $>10^5$  year time scale. About the neutrino physics, Borexino has given the first experimental observation of the neutrino oscillation in vacuum and the measurement of related  $\nu_e$  survival probability. Borexino reached also the highest evidence on the existence of the geoneutrinos, and many best limits for not observed events. Finally, the perspectives of new results on the Non Standard neutrino Interactions, on the possible existence of a sterile neutrino and on the challenging measurement of the CNO cycle are reviewed.

This seminar is part of the “lectio magistralis” presented at JINR in the occasion of the Bruno Pontecorvo 2016 prize awarding.



**LNGS - E. Majorana room**  
**October 26, 2016 - h 14:30**