Contribution ID: **31** Type: **Talk**

A Borexino breakthrough: first identification of fusion reactions that power the Sun and the stars

Tuesday 30 August 2022 15:45 (45 minutes)

The Borexino experiment, unique in the world for its radiopurity, in the last 15 years has answered to the humanity's primordial question about the nature of the Sun and the stars.
Already in the '30s of the last century, Hans Bethe and Carl Friedrich von Weizsäcker hypothesized the chain and the cycle of fusion reactions that power Sun and stars. The individual fusion reactions never have been measured, identified and confirmed (except one of them) until the Borexino experiment succeeded to measure the reactions of the pp chain, which produces 99% of the Sun energy, and of the CNO cycle, subdominant in the Sun (1%), but primary channel for hydrogen burning in massive stars, and in fact primary channel for hydrogen burning in the Universe. Also the CNO cycle never had a confirmation up to the Borexino experimental determination, allowing also to solve the long standing metallicity puzzle of the Standard Solar Model.
In this talk the experimental and analysis techniques are presented as well as the final results that have allowed to reach these historic breakthroughs.

Is this abstract from experiment?

Yes

Name of experiment and experimental site

BOREXINO

Is the speaker for that presentation defined?

Yes

Details

Prof. Gianpaolo Bellini - University and Infn Milano (Italy)

Internet talk

Yes

Author: Prof. BELLINI, Gianpaolo (University and INFN Milano - Italy)

Presenter: Prof. BELLINI, Gianpaolo (University and INFN Milano - Italy)

Session Classification: Lectures