FAKULTÄT für PHYSIK
LUDWIG-MAXIMILIANS-UNIVERSITÄT
MÜNCHEN/GARCHING

PHYSIK-DEPARTMENT
TECHNISCHE UNIVERSITÄT MÜNCHEN
MÜNCHEN/GARCHING

MLL-KOLLOQUIUM

Donnerstag, 13.11.2014, 16^{15} Uhr

Seminarraum 127, TUM, Physik II, Erdgeschoss/Nord
Treffen zum gemeinsamen Kaffee 16 Uhr

Dr. Marianne Goeger

(TU München, Physik-Department E15)

Understanding the Sun with neutrinos: Latest results from the Borexino experiment

Solar neutrinos have been detected over the past 40 years providing the first evidence of physics beyond the Standard Model of elementary particle physics. The hypothesis of neutrino oscillations has offered a solution to the long-standing solar neutrino problem. The Standard Solar Model (SSM) is a fundamental ingredient in the interpretation of the solar neutrino measurements. New determinations of solar metal abundances caused a conflict between SSM predictions and helioseismological measurements. The direct measurement of solar neutrinos from the individual fusion branches allows to probe the SSM.
Borexino is a low-background liquid scintillation detector at the Gran Sasso underground laboratory in Italy. Since the start of operations in 2007, Borexino has measured the flux of the ^{7}Be, ^{8}B, and pep solar neutrinos, and put the most stringent limit on the solar CNO-neutrino flux. These measurements were made possible by the low radioactive background levels achieved in the Borexino detector and by the adoption of novel data analysis techniques for the suppression of cosmogenic background. A further reduction of backgrounds after a purification campaign in 2010/11 has made possible the first spectral measurement of the most abundant solar pp neutrinos, confirming our understanding of the solar interior.

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