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Recent Results from Borexino

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The Borexino experiment is taking data since 2007 at the „Laboratori Nazionali del Gran Sasso" in Italy accomplishing outstanding achievements in the field of neutrino physics. Its success is strongly based on the unprecedented ultra-high radio-purity of the inner scintillator core. In this talk, after introducing the main features of the detector, the impressive results for solar and geo-neutrinos obtained by Borexino so far will be summarized. The main focus will be laid on the most recent and most prominent results, i.e. the first real-time measurement of the solar pp neutrino flux and the detection of the signal induced by geo-neutrinos with a significance as high as 5.9 sigma. Besides the measurement of the pp neutrino flux representing a direct probe of the major mechanism of energy production in the Sun, it makes Borexino the only experiment being able to probe the entire solar neutrino spectrum and puts it in the unique position of being capable to test the MSW-LMA paradigm across the whole solar energy range. The geo-neutrino data allow to infer information concerning important geophysical properties of the Earth that shall also be discussed. To conclude the talk, the perspectives of the final stage of the Borexino solar neutrino program that are centered on the goal of measuring the only missing part of the solar neutrino spectrum, the CNO neutrinos, will be outlined. In case of success, this measurement would constitute the climax of Borexino's long search to reveal the properties of solar neutrinos and extend the understanding of our Sun.

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