Abstract: The prime energy producer in the sun is the fusion of hydrogen to form helium. However, there is more than one way for this fusion to take place: for stars the size of the sun or smaller, the proton-proton (pp) chain reactions dominate (~99%), while in heavier stars, the carbon-nitrogen-oxygen (CNO) cycle is expected to play a more important role. Not only these fusion reactions would not have been possible without the emission of neutrinos, neutrinos are the only way to directly access the processes in the core of the sun.

Borexino experiment, located at the Laboratori Nazionali del Gran Sasso, was built with a primary goal of the Be7 solar neutrinos (part of pp chain) detection. In more than a decade of data taking, Borexino has not only demonstrated the unprecedentedly high sensitivity towards Be7 solar neutrinos (<3%) but performed a comprehensive study of low-energy neutrinos from the complete pp-chain. After a number of developments in both hardware and software, Borexino presents the first experimental evidence of the up-to-now elusive CNO fusion cycle in the Sun. The absence of the CNO neutrinos signal is disfavoured by the Borexino experiment at 5σ.