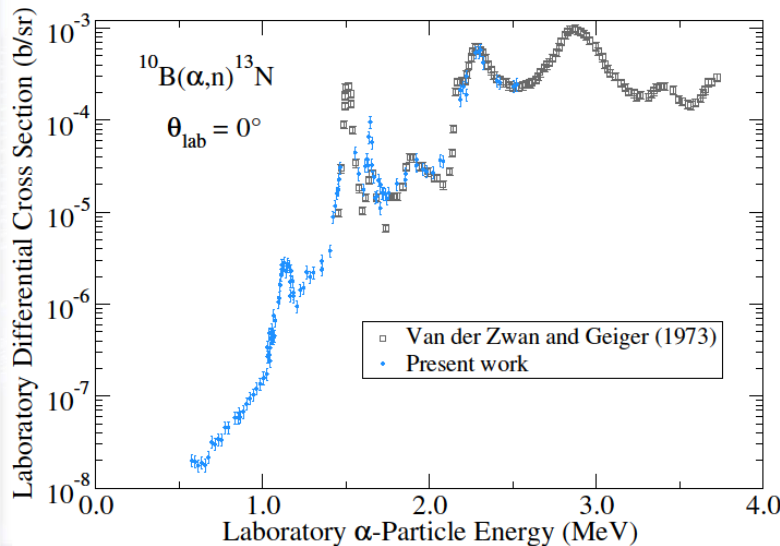
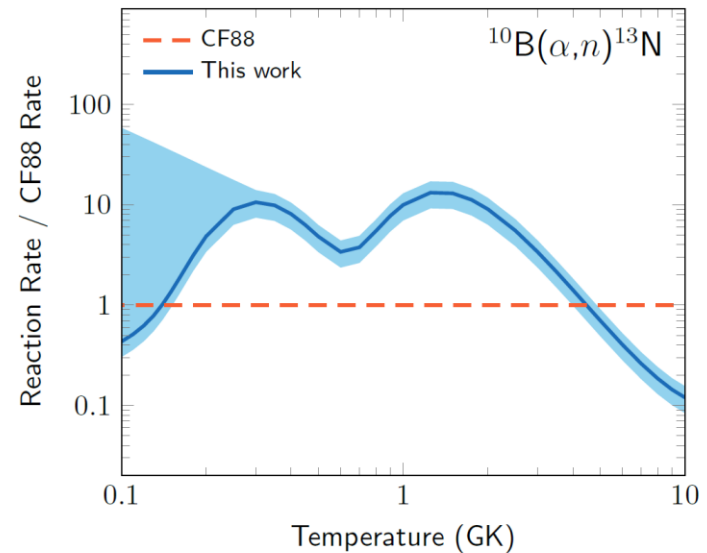


The $^{10}\text{B}(\alpha, n)^{14}\text{N}$ reaction and its impact on first-generation stars



First generation massive stars offer a unique setting for exploring the first appearance of heavier nuclei in a primordial environments. The triple-alpha-process primarily facilitates conversion of helium to carbon, there are however alternative reaction paths that may have a significant role. An example is the sequence of $^2\text{H}(\alpha, \gamma)^6\text{Li}(\alpha, \gamma)^{10}\text{B}(\alpha, n)^{13}\text{N}$.



New measurements are reported in this work for the $^{10}\text{B}(\alpha, n)^{13}\text{N}$ reaction, extending the cross section down to 575 keV. The experiments used a state-of-the-art deuterated liquid scintillator for measurements of the neutrons and a spectrum unfolding technique. An R-matrix analysis shows an unexpected upturn in the low energy S-factor indicating the presence of a new low energy resonance.

