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# The carbon fusion reaction at stellar energies

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The carbon fusion reaction is a crucial reaction in stellar evolution. Due to its complicated reaction mechanism, there is a large uncertainty in the reaction rate which limits our understanding to various stellar objects, such as massive stars, type Ia supernovae, and superbursts. In this talk, I will review the challenges in the study of carbon burning. I will also report recent results from our studies: 1) an upper limit for the  $^{12}\text{C} + ^{12}\text{C}$  fusion cross sections; 2) examination of the predictive power of extrapolating models for the carbon fusion reaction at stellar energies. An outlook for the future studies will also be presented.