

The $^{12}\text{C}+^{12}\text{C}$ fusion reaction at stellar energies

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The $^{12}\text{C}+^{12}\text{C}$ fusion reaction plays a pivotal role in the process of stellar evolution. Despite six decades of studies, there is still a large uncertainty in the reaction rate which limits our understanding of various stellar objects, such as massive stars, type Ia supernovae, and superbursts. In this talk, I will review the experimental and theoretical studies of the carbon fusion reaction at sub-barrier energies. I will also present the preliminary results from the direct measurement of the $^{12}\text{C}(^{12}\text{C},\alpha_0)^{20}\text{Ne}$ reaction, obtained by the CARFUSE (CARbon FUsion study at Stellar Energies) collaboration, using a novel detection system consisting of Time Project Chamber and silicon array and the intense carbon beam provided by the Low Energy high-intensity heavy-ion Accelerator Facility (LEAF) at IMP. An outlook for future studies is also presented.

Presenter: TANG, Xiaodong (Institute of Modern Physics, Chinese Academy of Science)

Session Classification: Stellar Evolutions and Hydrostatic Burning Processes

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