

## Heavy ion fusion reactions in stars

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Heavy ion fusion reactions play important roles in a wide variety of stellar burning scenarios. For example,  $^{12}\text{C}+^{12}\text{C}$ ,  $^{12}\text{C}+^{16}\text{O}$  and  $^{16}\text{O}+^{16}\text{O}$  are the principle reactions during the advance burning stages of massive star.  $^{12}\text{C}+^{12}\text{C}$  also triggers the happening of superburst and Type Ia supernovae. The heavy ion fusion reactions of the neutron-rich isotopes such as  $^{24}\text{O}$  are the major heating source in the crust of neutron star. In this talk, I will review the challenges and the recent progress in the study of these heavy ion fusion reactions at stellar energies. The outlook for the studies of the astrophysical heavy-ion fusion reactions will also be presented.

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