Contribution ID: **31** Type: **not specified**

# 12C + 12C fusion at low energies

*Tuesday, 17 August 2021 15:45 (15 minutes)*

Nuclear fusion reactions have very important significance in the area of nuclear astrophysics because they determine the nucleosynthesis of the elements in early stages of the universe and control the energy generation and evolution of stars. The precise knowledge of cross-sections and reaction rates of these nuclear fusion reactions are very important to describe the evolution of universe. There are various reactions which have strong significance in astrophysical aspects but our plan is to perform to experimentally study the 12C+12C fusion reaction at very low energies. This reaction is referred as carbon burning in stellar evolution process. Carbon burning plays a very important role in star which has mass greater than the eight solar mass (M > 8Mʘ). If mass is nearly 8Mʘ, then may end up as white dwarf and if mass is sufficiently larger than the 8Mʘ then it may show core-collapse supernovae.

Direct measurements of 12C+12C fusion cross sections have been performed over a wide range of energies by

The indirect Trojan Horse Method was applied [2] to measure the astrophysical S-factor for 12C+12C fusion

In the light of the above scenario, it has become very important to measure the fusion cross sections of 1

[1] T. Spillane et al., Phys. Rev. Letts, 98, 122501 (2007)

[2] A. Tumino et al., Nature 557, 687 (2018)

[3] A.M. Mukhamedzhanov et al, 99, 064618 (2019)

## Experimental nuclear physics

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## Theoretical nuclear physics

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**Session Classification:** Young Scientist Session 2