Contribution ID: **68** Type: **Oral Presentation**

First direct measurement of the 13N(alpha,p)16O reaction relevant for core-collapse supernovae

The first direct measurement of the total ^{13}N(α,p)^{16}O reaction cross sections was performed using a 34.6 MeV beam of radioactive ^{13}N and the active-target detector MUSIC at Argonne National Laboratory. The ^{13}N(α,p)^{16}O reaction affects the nucleosynthesis in core-collapse supernovae (CCSNe) for a range of relevant temperatures according to several recent sensitivity studies. The ^{13}N(α,p)^{16}O reaction cross sections at astrophysical energies have only been deduced via various indirect methods, and have never been measured directly. Recently published results for the ^{13}N(α,p)^{16}O reaction rate from this measurement will be presented, including new experimental data, a theoretical analysis, and an improved astrophysical reaction rate. This work was supported by the U.S. Department of Energy, Office of Nuclear Physics, under Contract No. DE-AC02-06CH11357. This research used resources of ANL's ATLAS facility, which is a DOE Office of Science User Facility.

Length of presentation requested

Oral presentation: 17 min + 3 min questions

Please select between one and three keywords related to your abstract

Nuclear physics - experimental

2nd keyword (optional)

Instrumentation

3rd keyword (optional)

Author: JAYATISSA, Heshani

Co-authors: Dr AVILA, Melina; Dr REHM, Karl Ernst; Dr TALWAR, Rashi; MOHR, Peter; Dr AURANEN, Kalle (Argonne national laboratory); Dr CHEN, Jie; GORELOV, Dmitry; Dr HOFFMAN, Calem R. (Argonne National Laboratory (US)); Dr JIANG, Cheng-Lie; Dr KAY, Benjamin Peter (Argonne National Laboratory (US)); Dr KUVIN, Sean; Dr SANTIAGO-GONZALEZ, Daniel

Presenter: JAYATISSA, Heshani