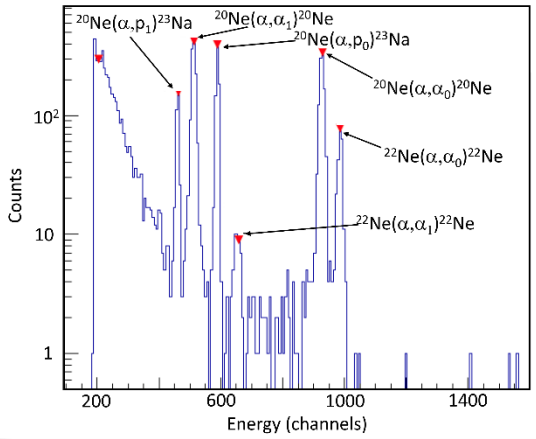
First measurement of $^{20}Ne(\alpha,p)^{23}Na$ for SNIa

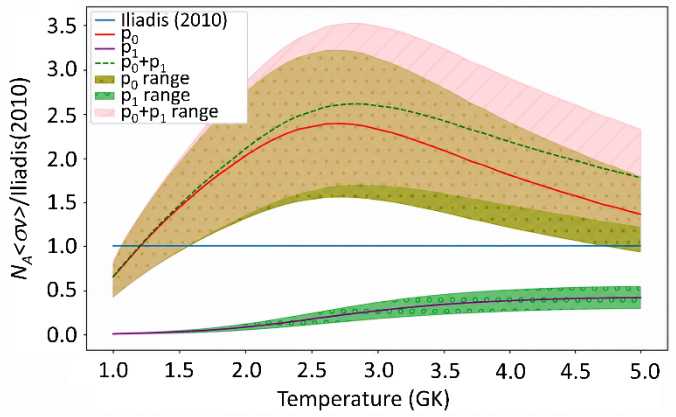
The $^{20}Ne(\alpha,p)^{23}Na$ reaction strongly impacts the nucleosynthesis in type Ia supernovae (SNIa). The reaction cross section had never been measured, and estimates relied on measurements of the inverse reaction which ignores branches populating excited ^{23}Na levels.



The cross section was recently measured using the 5U accelerator at the NSL to bombard a natural Ne target created with the Rhino windowless gas target.

The measured energy spectra (left) show substantial contributions to both the ground and first excited states of ^{23}Na.

The updated $^{20}Ne(\alpha,p)^{23}Na$ astrophysical reaction rate (right) was found to be larger than previous estimates by a factor of 2.5 partially because of the inclusion of excited state contributions.



C. Boomershine *et al.*, Phys. Rev. C **113**, 065804 (2026).
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