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## Indirect Investigation for AGB Stellar Nucleosynthesis (R)

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Asymptotic Giant Branch (AGB) stars play a major role in determining the galactic chemical evolution being the production site of almost 50% of elements heavier than iron through the slow neutron capture process (the so-called s-process) [1,2].

From a pure nuclear point of view, several processes take part during this peculiar stage of stellar evolution thus requiring detailed experimental cross section measurements. Here, we report on the most recent results achieved via the application of the Trojan Horse Method (THM)[3] and Asymptotic Normalization Coefficient (ANC)[4] indirect techniques, discussing the details of the experimental procedure and the deduced reaction rates.

In particular, the indirect investigations of the low-energy cross sections of proton and neutron-induced reactions on  $^{17}\text{O}$  and on  $^{18}\text{O}$  will be discussed, as well as the measurements of the key reactions involved in the  $^{19}\text{F}$  nucleosynthesis,  $^{19}\text{F}(p,\alpha)^{16}\text{O}$ , and  $^{19}\text{F}(\alpha,p)^{22}\text{Ne}$  reactions [5].

In addition, we report also on the on-going studies of interest for AGB nucleosynthesis.

[1] Herwig, F. Evolution of Asymptotic Giant Branch Stars Formation, *Annu. Rev. Astron. Astroph.*, 2005, 43, 435

[2] Iliadis, C. Nuclear Physics of Stars; Wiley-VCH: Weinheim, Germany, 2007

[3] Tumino, A. et al.; The Trojan Horse Method: A Nuclear Physics Tool for Astrophysics. *Ann. Rev. Nuc. Part. Sci.* 2021, 71, 345–376

[4] Burjan, V. et al, *Front. Astron. Space Sci.*, 10 November 2020

[5] Sergi, M.L. et al.; Trojan Horse Investigation for AGB Stellar Nucleosynthesis. *Universe* 2022, 8, 128.

### Session

Experimental Nuclear Astrophysics

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