Int. Workshop “Shapes and Dynamics of Atomic Nuclei: Contemporary Aspects”
ed. Nikolay Minkov, Heron Press, Sofia 2019

On the Nature of the Hoyle State

Cheuk-Yin Wong[1], **Andrzej Staszczak**[2]

[1]Physics Division, Oak Ridge National Laboratory, Oak Ridge, TN 37831, USA
[2]Institute of Physics, Maria Curie-Skłodowska University, Lublin, Poland

Abstract

The Hoyle state is an important state which facilitates the nucleosynthesis of elements by fusing three alpha particles together to form a ^{12}C nucleus. The nature of the Hoyle state and many of its low-lying excited state is not completely known. By comparing the signature of a toroidal ^{12}C nucleus with the spectrum of the ^{12}C nucleus, we find phenomenologically and microscopically that the Hoyle state and many of its higher excited states may be tentatively attributed to those of a ^{12}C nucleus in a toroidal configuration [1].

References

[1] Cheuk-Yin Wong and Andrzej Staszczak, *States of the ^{12}C Nucleus in the Toroidal Configuration*, arxiv:1902.06595 (2019)
https://arxiv.org/abs/1902.06595