

V.N. Kondratyev¹, I.V. Kres¹, I.M. Kadenko¹, S. Cherubini² and
C. Spitaleri²

Astrophysical S-factor for nuclear burning studies

¹ *Physics Department, Taras Shevchenko National University of Kyiv, Ukraine*

² *Dipartimento di Fisica e Astronomia, Università di Catania e Laboratori Nazionali del Sud-INFN, Catania, Italy*

Nuclear reactions are commonly recognized to give the predominant basic energy source for an evolution of the Universe. Studies of atomic nuclei are crucial, thereby, for learning and exploring such a renewable nuclear fuel. The fusion reactions of light nuclei provide the predominant energy component in main sequence stars. Iron gives then the final ash for nuclear reaction chains at hydrostatic burning. The thermonuclear fusion reactors are the respective counterpart at the Earth based environment. Magnetically confined fusion plasma, or Tokamak reactors are viewed as reliable direction. The astrophysical S-factor data are crucial for understanding respective nuclear processes. We consider various methods for revealing such data [1] and implications in nuclear reaction network [2].

[1] C. Spitaleri, *Proceedings of the Fifth Winter School on Hadronic Physics*, Folgaria Italy, Feb 1990, Problems of Fundamental Modern Physics II, p. 21-36, World Scientific 1990

[2] V.N. Kondratyev, *Bull.Univ.Kiev* **no.3**, 31 (2010)