Nuclear Data for Nuclear Astrophysics

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Nuclear astrophysics research addresses some of the most fundamental questions in nature: What are the origins of the elements that make up our bodies and our world? How did the solar system, the sun, the stars, and the galaxy form, and how do they evolve? Measurements and theoretical descriptions of *microscopic* nuclear physics phenomena provide the foundation for the sophisticated models of these *macroscopic* astrophysical systems. These models are today challenged by observations from space- and ground-based instruments that provide an incredibly detailed view of the Cosmos. In many instances, the ability of astrophysical models to explain these observations strongly depends on the input nuclear data, and more extensive and precise sets of nuclear data are required for these models than ever before. In fact, progress in solving numerous astrophysics puzzles hinges on the availability of accurate, comprehensive sets of nuclear data that incorporate the latest laboratory measurements and theoretical results.

To provide this information, scientists around the world are making measurements, developing nuclear models, evaluating reaction and structure information, and preparing the information in formats needed by astrophysical models. Some frontier techniques in each of these areas will be discussed, along with the available resources - including databases, websites, computer codes, and visualization tools. An outlook for the future of this growing field of nuclear astrophysics data will also be presented.

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