Stellar neutron capture rates key data for the *s* process

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Neutron reactions are responsible for the formation of the elements heavier than iron. The corresponding scenarios relate to the He- and C- burning phases of stellar evolution (*s* process) and to supernova explosions (*r* and *p* processes). The *s* process, which is characterized by low neutron densities, operates in or near the valley of β-stability and has produced about half of the elemental abundances between Fe and Bi in the solar system. Because the *s* abundances are essentially determined by the (n, γ) cross sections along the reaction path, accurate neutron data constitute the key input for *s* process studies. Important constraints for the physical conditions at the stellar sites can be inferred by comparison of the abundance patterns from current *s*-process models with solar system material or presolar grains.

The experimental methods for the determination of stellar (n, γ) rates are outlined at the example of recent cross section measurements and remaining quests will be discussed for existing laboratory neutron sources and future developments.