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The ASTRAL database for neutron-capture nucleosynthesis studies

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Present nuclear reaction network computations for astrophysical simulations involve many different types of rates, including neutron-capture reactions of interest for the modeling of heavy-element nucleosynthesis. While for many of them we still have to rely on theoretical calculations, an increasing number of experimentally-determined cross sections have now become available. In this contribution, we present the “ASTrophysical Rate and rAw data Library” (ASTRAL), a new online database for neutron-capture cross sections based on experimental results, mainly obtained through activation and time-of-flight measurements. For the evaluation process, cross sections were re-calculated starting from raw data and by considering recent changes in physical properties of the involved isotopes (e.g., half-life and γ -ray intensities). We show the current status of the database, the techniques adopted to derive the recommended maxwellian-averaged cross sections, and future developments.

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