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**Progress in nuclear physics experiments for the study of X-ray bursts<sup>1</sup>**

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Neutron stars in close binary star systems often accrete matter from their companion star. Thermonuclear ignition of the accreted material in the atmosphere of the neutron star leads to a thermonuclear explosion which is observed as an X-ray burst occurring periodically between hours and days depending on the accretion rate. However, the underlying nuclear processes that power the X-ray bursts are often difficult to measure in accelerator-based laboratories. In this talk, I will discuss recent experimental progress in nuclear physics for the input of X-ray bursts model simulations. In particular, I will present new experiments on the measurements of nuclear breakout reactions from the hot CNO cycle that are critical to the ignition conditions of X-ray bursts. Recent measurements of reaction rates along the rp- and  $\alpha$ p- process path that determine the X-ray burst light curves will also be discussed. Astrophysical implications of the experimental results will be explored within the context of X-ray burst models.

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