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Nuclear Masses in Astrophysics

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The masses of nuclei are of fundamental importance in astrophysics. They determine the energy generation in stars and thermonuclear stellar explosions, and shape the distribution of isotopic abundances found in the universe and on earth. A major challenge today is the understanding of the masses of very unstable nuclei, which power X-ray bursts and shape the nucleosynthesis in the rapid neutron and proton capture processes. In the last few years this area has been revolutionized with major experimental advances at rare isotope beam facilities. I will review this progress and the impact it had on our understanding of astrophysical processes.