

Nuclear Astrophysics and Stellar Explosions

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Nuclear astrophysics aims at understanding the cosmic origin of the chemical elements and the energy generation in stars. It constitutes a truly multidisciplinary arena that combines tools, developments and achievements in theoretical astrophysics, observational astronomy, cosmochemistry and nuclear physics: supercomputers have provided astrophysicists with the required computational capabilities to study the evolution of stars in a multidimensional framework; the emergence of high-energy astrophysics with space-borne observatories

has opened new windows to observe the Universe, from a novel panchromatic perspective; cosmochemists have isolated tiny pieces of stardust embedded in primitive meteorites, giving clues on the processes operating in stars as well as on the way matter

condenses to form solids; and nuclear physicists have measured reactions near stellar energies, through the combined efforts using stable and radioactive ion beam facilities.

This talk will provide a comprehensive insight into the nucleosynthesis accompanying stellar explosions, with particular emphasis on thermonuclear supernovae, classical novae, and type I X-ray bursts.

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