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**Hans A. Bethe Prize Talk: Nuclear Physics, Stellar Explosions and the Abundance Evolution in Galaxies**

FRIEDRICH-K. THIELEMANN, University of Basel

The computational modeling of astrophysical objects requires the combined treatment of different subfields of physics for a complete description: 1. hydrodynamics/hydrostatics for the modeling of mass flows, 2. energy generation and nucleosynthesis for understanding the composition changes due to nuclear reactions and the related energy release, 3. energy transport via conduction, radiation or possibly convection, and finally 4. thermodynamic properties of the matter involved, especially the equation of state which creates a direct relation between energy release and hydrodynamic response via pressure and entropy. Nuclear physics obviously plays an essential role for energy generation and nucleosynthesis, but can also enter radiation transport (e.g. in supernovae) via neutrino-nucleon/ nucleus interaction and clearly determines the equation of state at nuclear densities (e.g. in neutron stars). In this review we want to highlight the role and impact of nuclear physics and its uncertainties on the explosion mechanism and/or the ejected abundances of type Ia and type II supernovae, novae and X-ray bursts, plus their imprint witnessed in the so-called chemical evolution of galaxies. Special emphasis is given to the properties of proton- as well as neutron-rich exotic nuclei far from stability.