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Nucleosynthesis Yields from the Explosion of Massive Stars
CARLA FROHLICH, Enrico Fermi Institute, University of Chicago, T. FISCHER, M. LIEBENDOERFER, F.-K. THIELEMANN, University of Basel, J.W. TRURAN, University of Chicago — The large number of recent abundance observations in metal-poor stars and the progressing field of galactic evolution pose a need for improved predictions of nucleosynthesis yields from core collapse supernovae. The innermost ejecta and especially the Fe-group nuclei are directly affected by the explosion mechanism. Induced explosion models employing a piston or thermal bomb fail to predict the observed yields because the effects of neutrino interactions are not included. However, comprehensive core collapse supernova simulations are a complex and long standing problem. Despite continuous improvement they still bear important uncertainties. We will present detailed nucleosynthesis yields based on a model for the supernova ejecta featuring accurate Boltzmann neutrino transport and detailed neutrino-matter interaction in the nuclear network. The results will be confronted with recent observations of metal-poor stars and their impact on Galactic chemical evolution will be addressed.

Carla Frohlich
University of Chicago

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