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Formation of the Rare Earth Peak: Gaining Insight Into Late-Time r-Process Dynamics[1] MATTHEW MUMPOWER, GAIL MCLAUGHLIN, North Carolina State University, REBECCA SURMAN, Union College — The classical r-process is thought to be responsible for approximately half of the neutron-rich elements above iron. While many studies of r-process environments have focused on early time behavior, eg. conditions for sufficient neutron-to-seed ratio, less effort has been made studying late-time r-process dynamics. We study the formation and evolution of the rare earth peak which occurs as matter decays back to stability. We show that the rare earth peak is sensitive to the interplay between thermodynamic evolution and nuclear physics input. We highlight the late-time dynamical behavior which is critical for peak formation and show that the final structure of the rare earth abundances depends most strongly on the nuclear physics input. We identify neutron capture rates which are critical to rare earth peak formation. These nuclei lie within 10-15 neutrons from stability.

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