Abstract for an Invited Paper for the DNP10 Meeting of The American Physical Society

Neutrino Mass and Mixing in Astrophysics and Cosmology¹ GEORGE FULLER, University of California, San Diego

Astrophysical considerations may provide a probe of the properties of the mysterious neutrinos. I discuss how neutrino mass and flavor oscillations can be important in astrophysical environments like the early universe, cosmology, and core collapse supernovae. For example, supercomputer supernova simulations reveal that neutrino flavor transformation and, consequently, the expected supernova neutrino signal, can depend sensitively on the as yet unmeasured neutrino mass hierarchy and the mixing angle θ_{13} , both targets of on-going experimental efforts. Likewise, I will argue that other aspects of neutrino physics, untestable in the laboratory, nevertheless have consequences for the physics of stellar collapse, nucleosynthesis, the early universe, and cosmology.

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