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**Understanding the sensitivity of core-collapse supernovae to weak interaction rates**[1] CHRIS SULLIVAN, REMCO ZEGERS, National Superconducting Cyclotron Laboratory, Michigan State University, EVAN O'CONNOR, Canadian Institute for Theoretical Astrophysics, University of Toronto, THOMAS GRUBB, SAM M. AUSTIN, National Superconducting Cyclotron Laboratory, Michigan State University — In the past decade the treatment of electroweak interactions in core-collapse supernovae (CCSNe) simulations has improved significantly. As an example, we now understand the critical role electron capture plays in destabilizing the stellar core to collapse and its impact on the whole thermodynamic composition/configuration during the in-fall epoch. Electron capture rates are therefore crucial nuclear physics inputs to CCSNe simulations. These rates are estimated on the basis of theoretical nuclear structure calculations which are evaluated against results from beta-decay and charge-exchange experiments. By implementing detailed weak interaction rates into neutrino transport calculations utilized by the CCSNe code GR1D, we are now able to test in great detail the sensitivity of the late evolution of supernovae to electron-capture rates. This effort will help identify which experiments (including those in the future at FRIB) are most important for improving nuclear theory and, by extension, the astrophysical models. In this presentation I will briefly discuss these recent efforts, their connection to experiment, and a few preliminary results.

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