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Neutrino-driven Convection and SASI in Three-Dimensional Core-Collapse Supernovae CHRISTIAN D. OTT, ERNAZAR ABDIKAMALOV, ROLAND HAAS, CHRISTIAN REISSWIG, PHILIPP MOESTA, HANNAH KLION, TAPIR, Caltech, ERIK SCHNETTER, Perimeter Institute — The mechanism of core-collapse supernova explosions likely relies on support from two hydrodynamical instabilities: neutrino-driven convection and the standing accretion shock instability (SASI). We investigate under which conditions these instabilities develop. We perform 3D general-relativistic simulations of collapse and postbounce evolution of a 27-$M_\odot$ star with a neutrino leakage scheme. We consider a range of neutrino heating rates and find the development of the 3D SASI in models with weak neutrino heating that do not develop explosions. Models that explode are dominated by neutrino-driven convection.

Christian Ott
Cal Inst of Tech (Caltech)

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