

Abstract Submitted  
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**Revealing nearby failed supernovae with megaton neutrino telescopes** LILI YANG, CECILIA LUNARDINI, Arizona State University — We study the detectability of neutrino bursts from nearby direct black hole-forming collapses at Mt class detectors. Due to their high energetics, these bursts could be identified – by the time coincidence of  $N \geq 2$  or  $N \geq 3$  events within a  $\sim 1$  s time window – from as far as  $\sim 4 - 5$  Mpc away. This distance comprises several major, supernova-rich galaxies, so that failed supernova bursts could be detected at a rate of up to one per decade, comparable to the expected rate of the more common, but less luminous, neutron star-forming collapses. Thus, the detection of a failed supernova within the lifetime of a Mt detector is a realistic possibility. It might give the first evidence of direct black hole formation, with important implications on the physics this phenomenon.

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