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Underground probes of supernova mechanism

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The mechanism of the core-collapse supernova is not completely established and continues to fuel a lot of active research. With the advent of DUNE and HyperKamiokande, the neutrino burst from the next galactic core-collapse supernova will allow us to observe the development of the explosion in real time, during the first crucial ten seconds. The task is to understand how to read this signal, how to relate it to the underlying physical processes, and how to best optimize the detector design. In this talk, I will describe the neutrino signatures of the termination shock in the hot bubble region. I will show that it provides a sensitive probe of physical conditions above the surface of the protoneutron star.

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