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Deciphering the next supernova using neutrinos (12'+3')

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Supernovae are the spectacular end in the lives of massive stars. Neutrinos are an important player in the explosion and account for 99% of the explosion energy. IceCube, a detector embedded in the ice at the South Pole, will make a precision measurement of the neutrino rate from the next galactic supernova. This measurement will give us an unprecedented look at the inner structure of the exploding star. Future detectors, such as Hyper-Kamiokande, will give even more details of the explosion, such as the neutrino energies and supernova direction, and will allow us to see more distant supernovae. This talk will discuss what physics we expect to extract using neutrinos detected in current and next-generation detectors from the next galactic supernova, as well as future prospects to measure many distant supernovae.

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