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## **Supernova Model Discrimination with Hyper-Kamiokande**

Supernovae produce many of the chemical elements necessary for life and their remnants—neutron stars and black holes—are interesting astrophysical objects in their own right. However, the explosion mechanism of supernovae is not yet well understood.

Hyper-Kamiokande is a next-generation neutrino detector that will be able to observe the neutrino flux from the next galactic supernova in unprecedented detail. Using a newly-developed, high-precision supernova event generator, we simulate Hyper-Kamiokande's response to five different supernova models. We show that Hyper-Kamiokande will be able to distinguish between these models with high accuracy for a supernova at a distance of up to 100 kpc.

These findings indicate that, once the next galactic supernova happens, Hyper-Kamiokande will be able to determine details of the supernova explosion mechanism.

### **Mini-abstract**

If a supernova happens within 100 kpc, Hyper-Kamiokande can identify the explosion mechanism

### **Experiment/Collaboration**

Hyper-Kamiokande

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