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Type: **Short talk (15min. + 5 min. Q/A)**

# **Towards Multi-task transformer based reconstruction for real-time high-energy neutrino alerts.**

*Tuesday 28 October 2025 09:20 (15 minutes)*

The IceCube Neutrino Observatory issues a variety of real-time alerts that identify high-energy neutrino events with a high probability of astrophysical origin. These alerts rely on rapid reconstruction of the incident particle's direction and energy, enabling follow-up observations by other telescopes and observatories in the context of multi-messenger astronomy. Traditionally, reconstruction methods for these alerts have been likelihood-based, requiring assumptions about event morphology. Recent advances in machine learning, both broadly and within IceCube, now enable work towards a fast and flexible event reconstruction without the need for such priors. In this talk, I will present a proposed GraphNet-based neural network approach for fast reconstruction of high-energy neutrinos.

**Presenter:** ROSTED, Aske

**Session Classification:** Experiments - Cherenkov-based Neutrino Telescopes