Contribution ID: **179** Type: **Oral**

IceCat-2: An Updated Catalog of High-Energy Neutrino Alerts from IceCube

Monday 25 August 2025 17:00 (20 minutes)

We present IceCat-2, the planned update of IceCube's public catalog of high-energy neutrino alerts, which builds on the first release, IceCat-1. The original catalog included all real-time alerts sent out since 2016, as well as earlier events from 2011 onward that would have triggered alerts if the system had been active at the time. IceCat-2 includes more recent alerts and reprocesses the entire dataset using a new reconstruction method implemented into the realtime stream in September 2024. This updated method significantly improves the precision and statistical coverage, with which we can determine the direction of incoming neutrinos, reducing the typical uncertainty in area by a factor of ~5 compared to previous analyses. With this improvement, we can more effectively search for connections between IceCube alerts and known astrophysical sources, such as gamma-ray and X-ray sources. The improved catalog enables new studies aimed at identifying counterparts to high-energy neutrino alerts, offering deeper insight into the nature and location of potential cosmic accelerators.

Collaboration you are representing

IceCube Collaboration

Author: VALTONEN-MATTILA, Nora (Ruhr Universität Bochum)

Co-authors: ZEGARELLI, Angela; FRANCKOWIAK, Anna; SOMMANI, Giacomo; YUAN, Tianlu

Presenter: VALTONEN-MATTILA, Nora (Ruhr Universität Bochum)

Session Classification: Neutrino Physics and Astrophysics

Track Classification: Neutrino Physics and Astrophysics