



Contribution ID: 135

Type: **Oral contribution**

Towards high-resolution 3D tracking in scintillator-based neutrino detectors

Monday, August 31, 2026 3:00 PM (30 minutes)

Scintillator-based detectors are widely used in neutrino experiments owing to their particle-tracking and calorimetry capabilities.

Traditionally, achieving high spatial resolution alongside a massive active target requires both segmentation and optical separation, that comes at the cost of increased manufacturing complexity and a massive number of readout channels.

To overcome these challenges, newly developed technologies aim to enhance 3D tracking performance in future neutrino experiments without sacrificing target mass. For plastic scintillators, current efforts include the high-precision assembly of tiny scintillating cubes or fibers, as well as 3D-printing optically-isolated voxels within monolithic blocks. Similarly, 3D optical separation or tracking in opaque liquid scintillators present promising options.

Finally, recent developments showed sub-millimeter tracking resolution in unsegmented scintillators using arrays of light-field cameras.

After a brief review of scintillator detectors deployed in current experiments, I will discuss ongoing R&D geared toward future facilities.

Primary author: Prof. SGALABERNA, Davide (ETH Zurich)

Presenter: Prof. SGALABERNA, Davide (ETH Zurich)

Session Classification: Plenary

Track Classification: Plenary Session