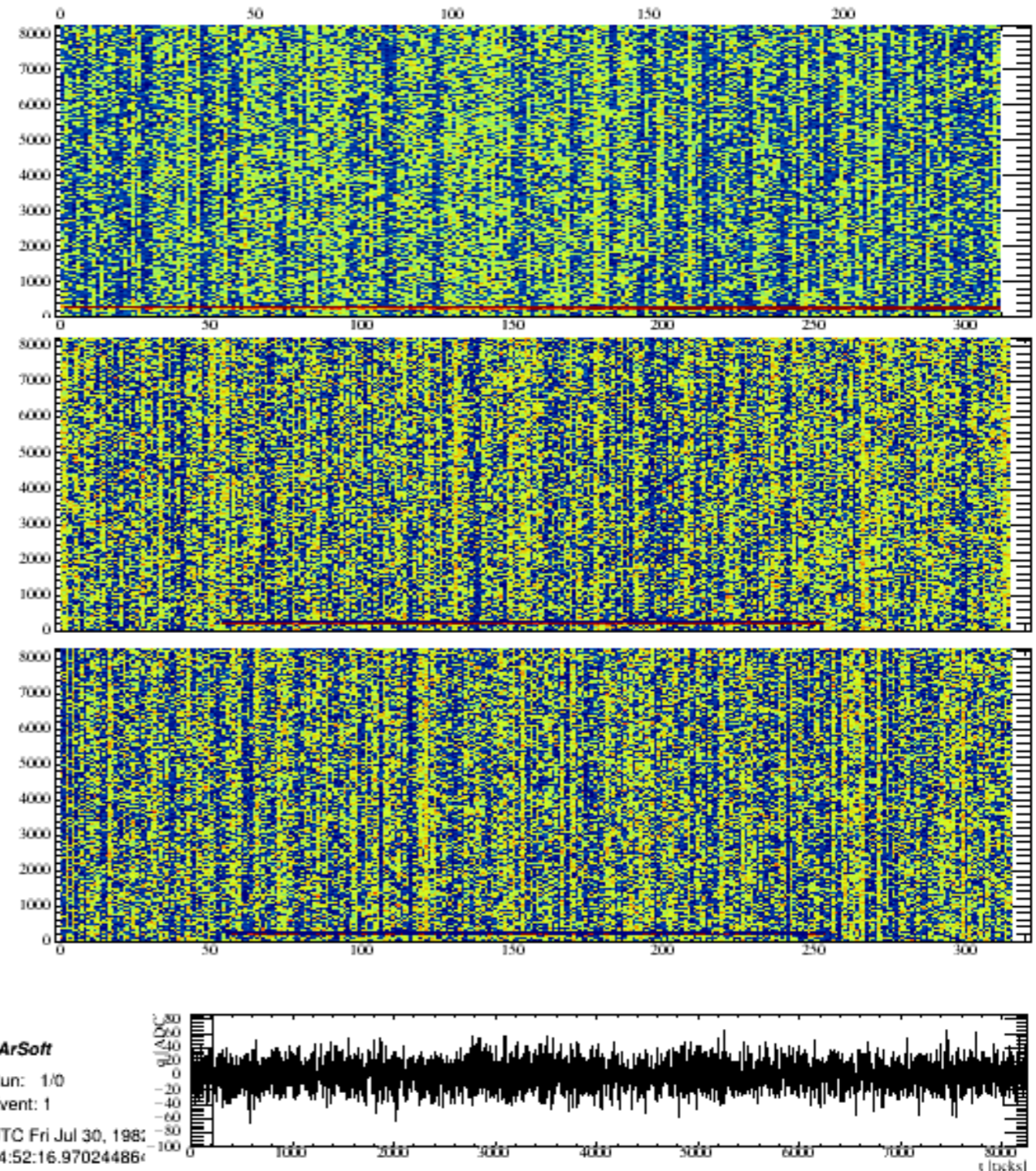# Single Muon MC for ICEBERG AI
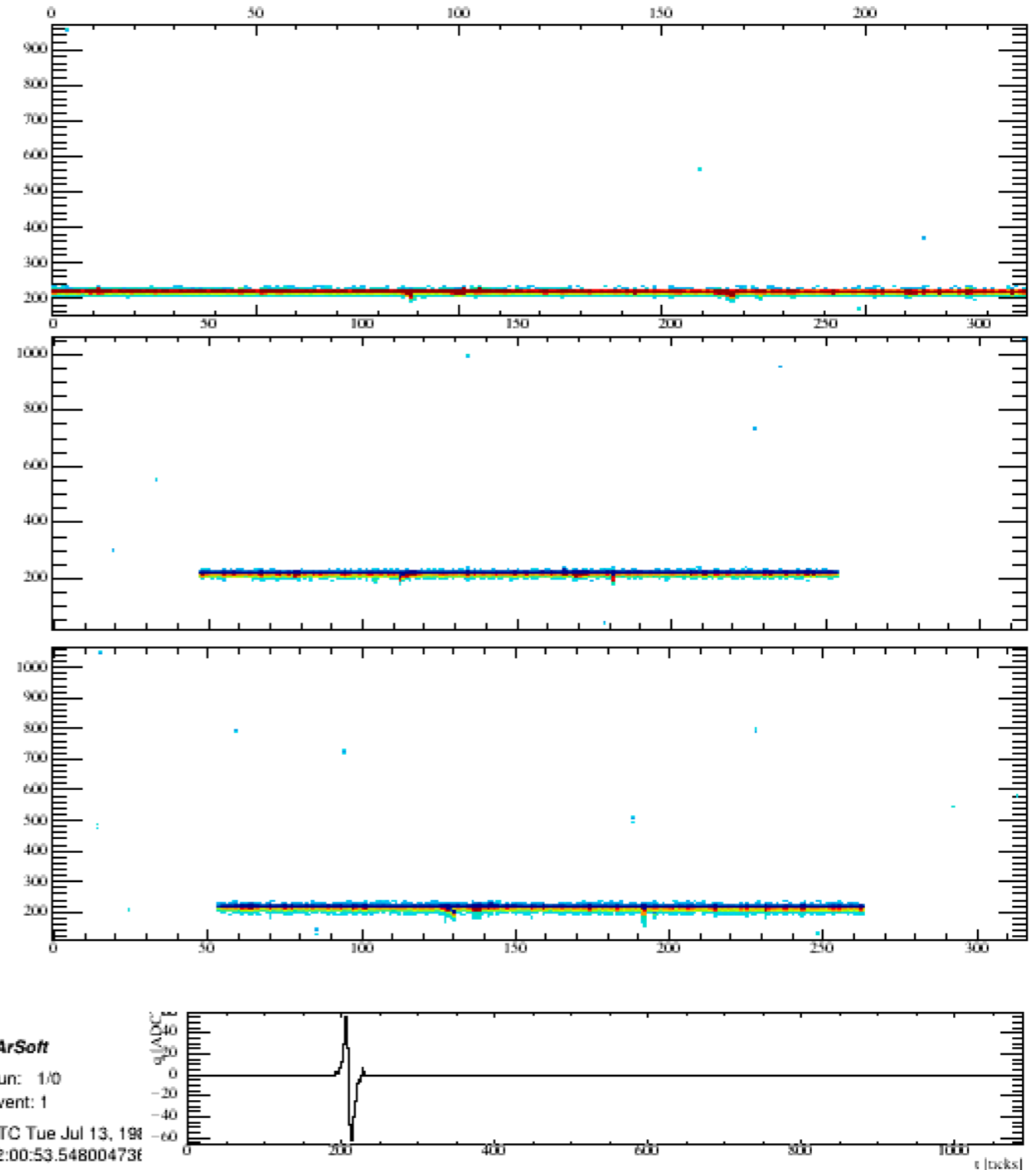
**Alejandro Yankelevich**

# Single Muon MC

- Single muon generation FHiCL available in dunesim/EventGenerator/prodsingle_iceberg_refactored.fcl

  - Instructions in Wiki: https://wiki.dunescience.org/wiki/Generating_Single_Muon_MC_file_for_ICEBERG

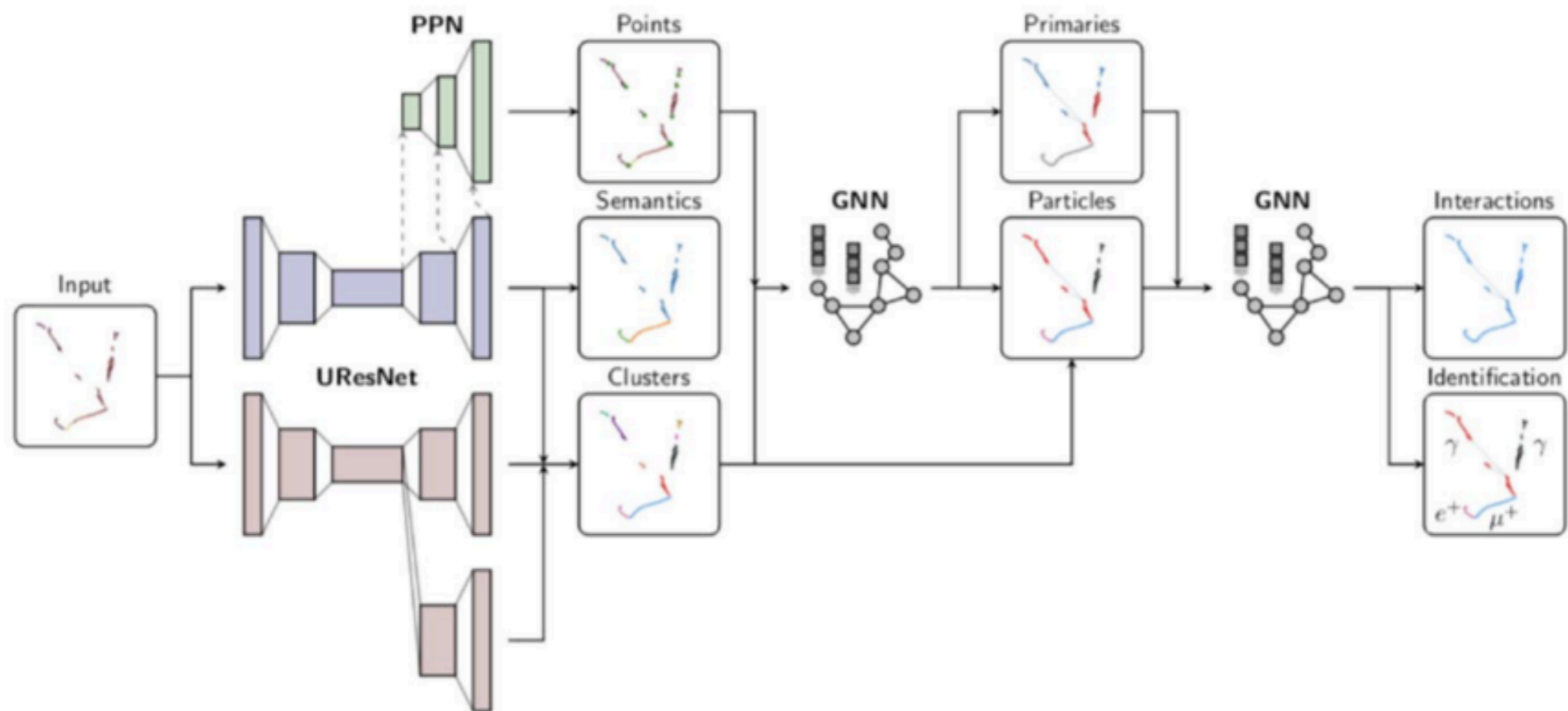- Triggers on hits above threshold and saves RawDigits with WireCell

2

# Legacy Reco

- Basic reconstruction FHiCL: dunesw/fcl/iceberg/reco/legacy_reco_iceberg.fcl

- Applies typical reco modules from dune10kt with iceberg geometry, e.g. linecluster, pandora, pmtrackcalo, pmtrajfittc, emshower
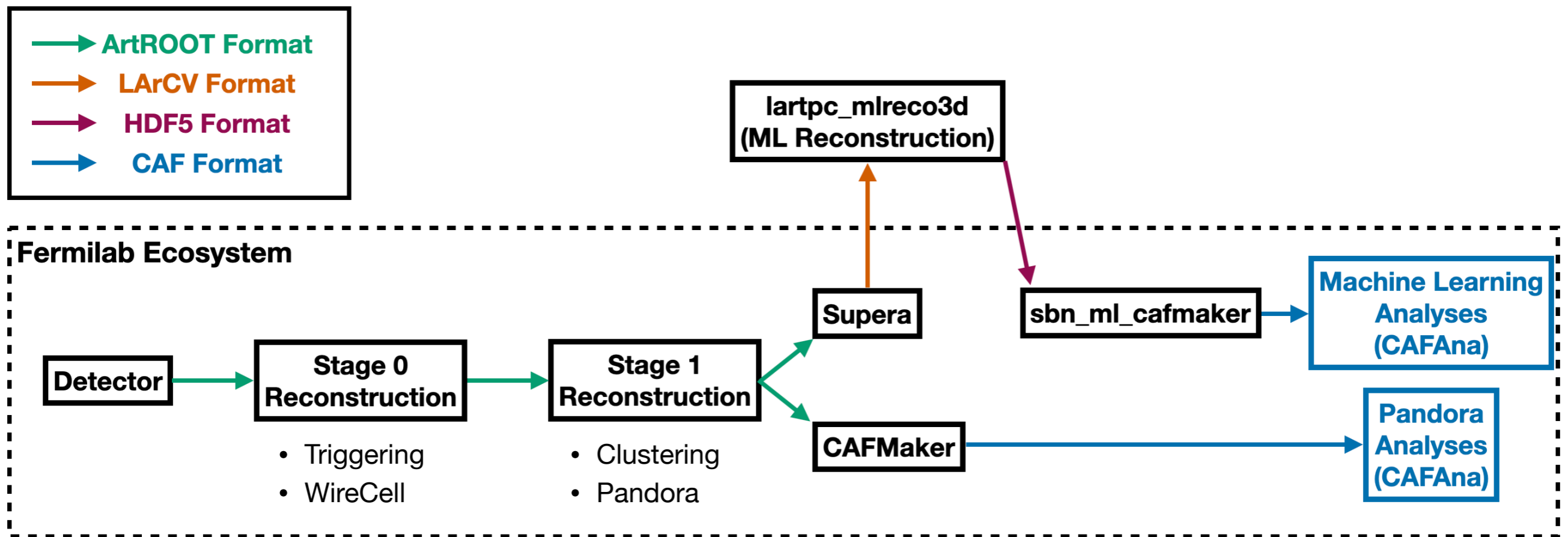
# LArCV

- Liquid Argon Computer Vision is suite of tools developed by MicroBooNE for LArTPC reconstruction with ML

# ICARUS Data Flow

- Currently studying ICARUS stage 0/1 reconstruction and Supera to see if can be adapted for ICEBERG

# Status

- Have run <u>icarus_ml_workshop_2023</u> Michel electron tutorial

    - Studying h5 input file format

- Currently trying to compile <u>icaruscode</u> on DUNE GPVM

- Goal is to run stage1_run2_larcv_icarus_MC.fcl, applying Supera to ICEBERG single muon MC

# PyNuML

- UC-developed framework for preprocessing data into ML inputs

- Outputs used to train GNNs at DUNE and NOvA

- UCI using NOvA PyNuML outputs from H5CAFs for transformer training