

# US HFCC: AI, Integrated Detector Concepts, & Microelectronics

L2 : Julia Gonski, Jim Hirschauer

L3 : Tim Andeen, Liza Brost, Jennet Dickinson, Loukas Gouskos



HFCC Detector Workshop: Cross-Cutting Session

[19 Dec 2024](#)

# AIM Overview

- L2s: Jim & Julia
- Scope: cross-cutting group relating to general incorporation of key technologies and detector integration
  
- **AI:** Jennet Dickinson
- **Integrated Detector Concepts:** Liza Brost & Loukas Gouskos
- **Microelectronics:** Tim Andeen

# Simulation Priority: Detector Design/Optimization Challenge

- What it is:
  - Organized/self-contained sandbox for detector concepts and optimization
  - Enable community to explore new integration ideas for contribution to international efforts
  - Consists of agreed-upon physics benchmarks & Madgraph (eg. Higgs, DVs), simple analysis scripts to produce “results”, and modifiable detector simulation
  - → **Collaboration among TDAQ, S&C, and AIM; involves & benefits all subsystem L2 areas**
- What we need:
  - Sub-detector GEANT simulation : Recent improvements?
  - Full-detector Delphes simulation reflecting latest sub-det performance
  - Simulation of sub-detector analog signals and digital data flow for study of readout electronics, AI methods, TDAQ bandwidth needs
  - → **0.5 FTE of student/postdoc to lead simulation development and compilation (with senior advising)**
- Timescale (?):
  - Launch challenge by end of FY25
  - Results to be presented at US H(FCC) Workshop in spring 2026

