

LANL EIC/SVT Interest

Matt, Xuan, Yasser, Ming et al

10/08/2026

ePIC SVT Workshop at LBNL

<https://indico.bnl.gov/event/33887/overview>

Personnel

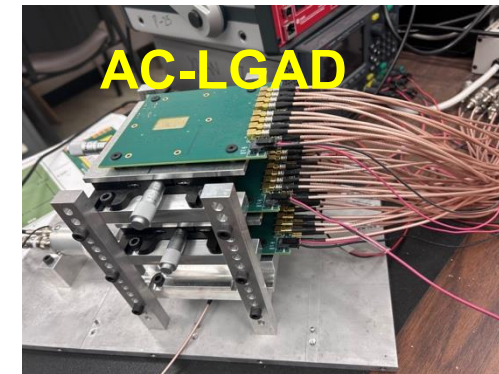
- **Staff working on HI and MEP physics**

- Matt Durham, Cesar da Silva, Hugo Pereira Da Costa, Kun Liu, Xuan Li, Yasser Corrales, Ming Liu, Eric Renner (ME), Walt Sondheim(Ret.), Pat McGaughey(Ret.), Hubert van Heck(Ret.)
- Several postdocs and students
- Engineer (EE) and data scientist (AI) from other groups

- **Current projects:**

- sPHENIX/PHENIX, HI and Spin (Hugo, Xuan, Kun, Cesar, Matt, Ming et al)
- LHCb heavy ion (Matt, Cesar et al)
- AMBER Drell-Yan at CERN (Kun, Ming et al)
- SpinQuest/SeaQuest at FNAL (Kun, Ming et al)
- EIC silicon R&D, AC-LGAD, MALTA (Xuan, Ming et al)
- Muon tomography (Matt et al)
- LANL LDRDs
 - sPHENIX quarkonia physics (Hugo et al)
 - EIC GPD physics (Xuan et al)
 - EIC BSM physics (Ming et al)
 - AMBER fixed-target Drell-Yan (Kun et al)
- Genesis phase-I “Fast-ML Agentic AI for EIC Streaming” (Ming et al)

**MVT Telescope,
FVTX/AMBER
@MAPS Lab**



FAST-Si Lab



Capabilities, Infrastructures & Recent Si Work

- **Technical capabilities**

- Access to rich engineering capabilities through LANL
 - Electrical, readout and control, design
 - Mechanical, design, simulation and prototyping
- Decades of experience with silicon detectors, end-to-end

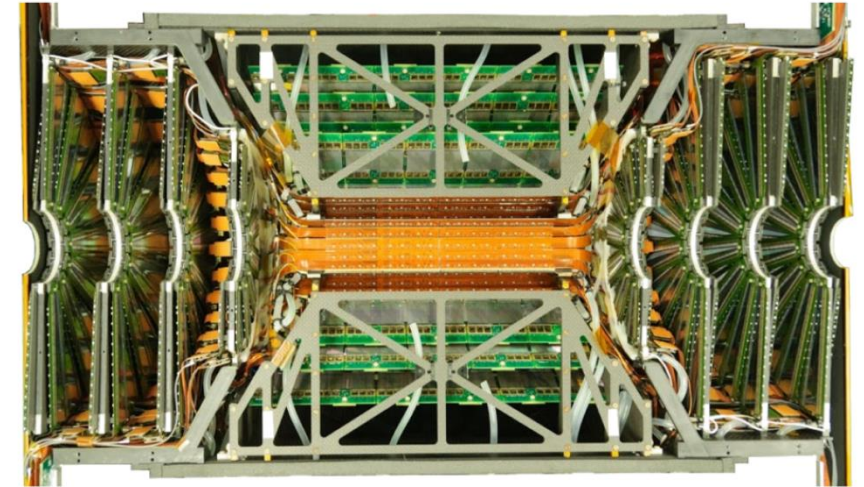
- **Infrastructures and facilities**

- Two silicon R&D labs
 - MVTX/sPHENIX and FVTX/AMBER streaming readout, AI/ML integration
 - AC-LGAD, MALTA sensor evaluation, readout and control R&D
- Scintillator detector R&D lab
 - LHCb magnet tracking station
 - FNAL SeaQuest/SpinQuest dark-photon trigger system
- Muon tomography lab
 - Gas detector R&D, Proptube, TPOT
- Clean tent for silicon detector assembly and QA
 - AOT clean room available (BLDG-17, class-1000)
 - Access to other engineering & technical support if needed

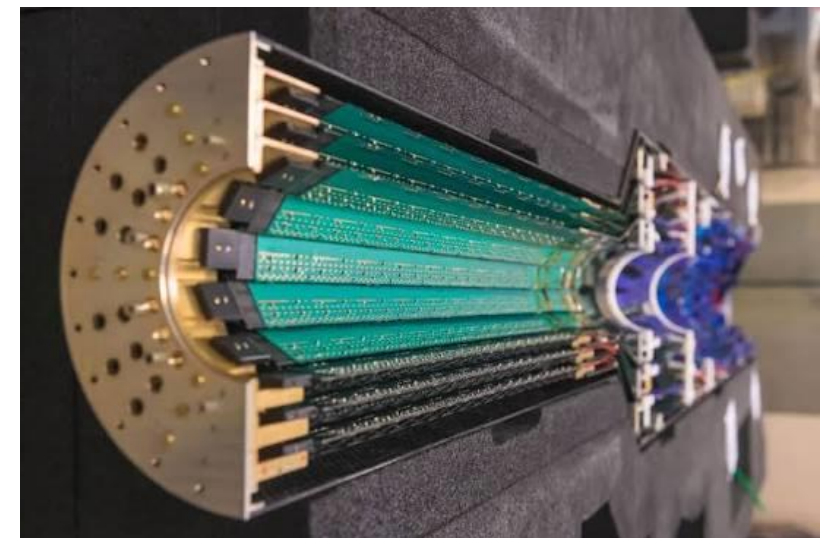
- **Recent EIC/SVT relevant projects**

- sPHENIX MVTX and TPOT, and PHENIX FVTX at RHIC
 - From initial R&D to final detectors for physics – final design, construction, integration, commissioning, operation, maintenance, calibration and analysis
- AMBER silicon detector upgrade at CERN
 - Repurpose FVTX for fixed target Drell-Yan experiment, integration and streaming readout
- Fast-ML for sPHENIX and EIC
 - Streaming readout and AI/ML
 - Agentic AI for streaming readout

FVTX/PHENIX



MVTX/sPHENIX



Interest in SVT Construction & Physics

- **Forward (and/or Backward) SVT**

- Module assembly and QA
- Readout and control integration
- **Forward HF physics @EIC**

- **AI/ML integration into SVT streaming readout**

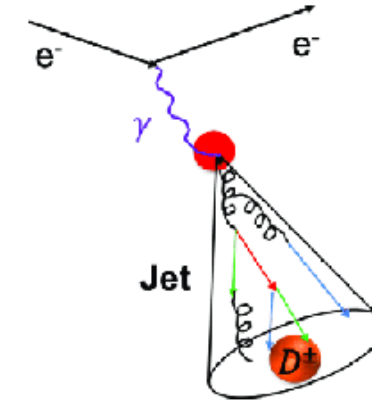
- SVT background suppression and data reduction
- DOE Fast-ML projects for sPHENIX and EIC
 - Lessons learned from sPHENIX MVTX operation
- Genesis phase-I project
 - “Agentic AI for Real-time Expedited Discovery High-Complexity EIC Data Streams”

Other interests:

Far-forward silicon detectors for

1. Enhanced-ZDC w/ silicon pixels
2. AC-LGAD, B0 etc.

$$e^- + p \rightarrow e^- + \text{jet}(D^\pm) + X$$



$$e^- + \text{Au} \rightarrow e^- + \text{jet}(D^\pm) + X$$

