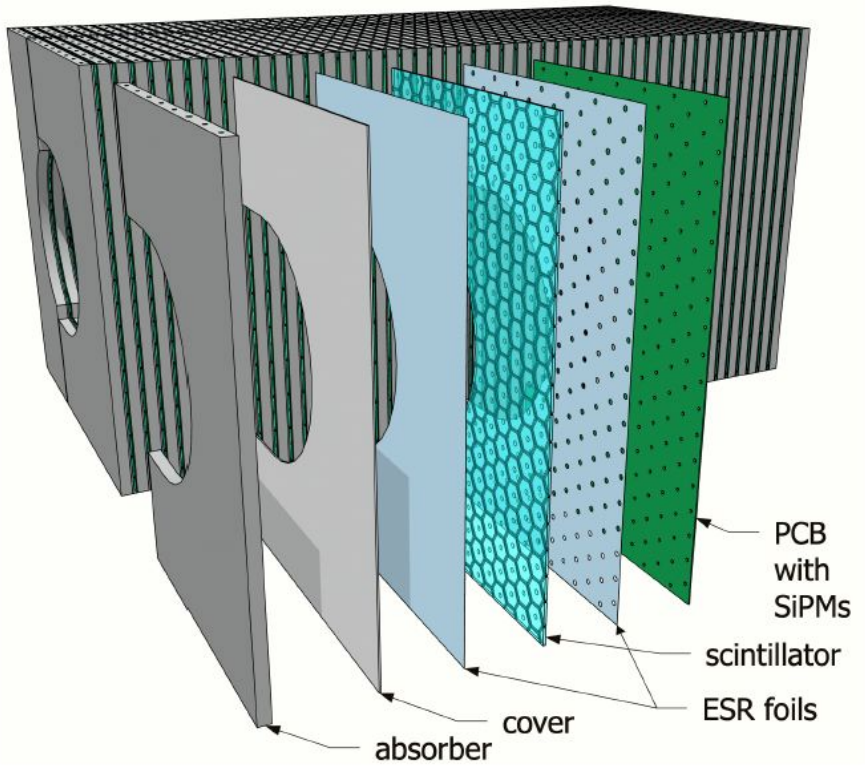
updates

Miguel Arratia

Calorimeter Insert (Cali) design paper published



Nuclear Instruments and Methods in Physics Research Section A: Accelerators, Spectrometers, Detectors and Associated Equipment

Volume 1047, February 2023, 167866

A high-granularity calorimeter insert based on SiPM-on-tile technology at the future Electron-Ion Collider

Miguel Arratia [a], Kenneth Barish [a], Liam Blanchard [a], Huan Z. Huang [b], Zhongling Ji [b], Bishnu Karki [a], Owen Long [a], Ryan Milton [a, b], Ananya Paul [a], Sebouh J. Paul [a], Sean Preins [a], Barak Schmookler [a], Oleg Tsai [b], Zhiwan Xu [b]

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https://doi.org/10.1016/j.nima.2022.167866

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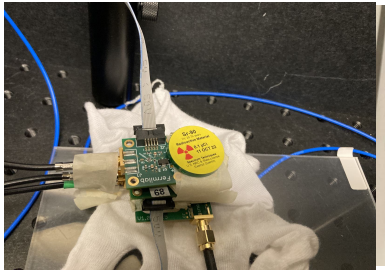
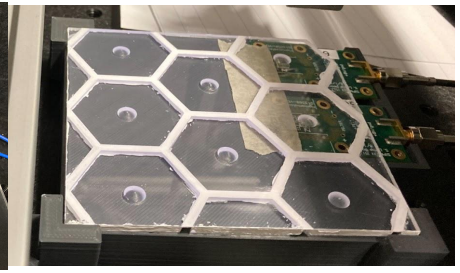
Summary of calorimeter insert design and performance — *Ryan Milton*

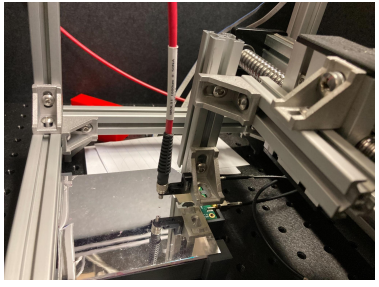
PAB 3-326, UCLA, Physics and Astronomy Building — 09:00 - 09:20

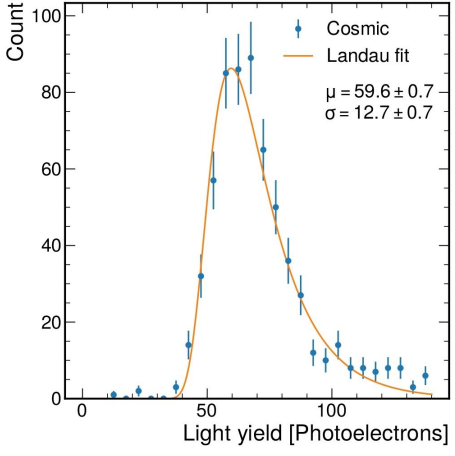
Light yield, time resolution, optical cross-talk

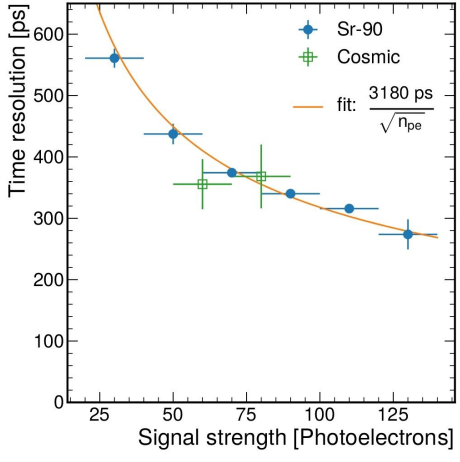
measured with cosmics, Sr-90, UV LED, and fast laser

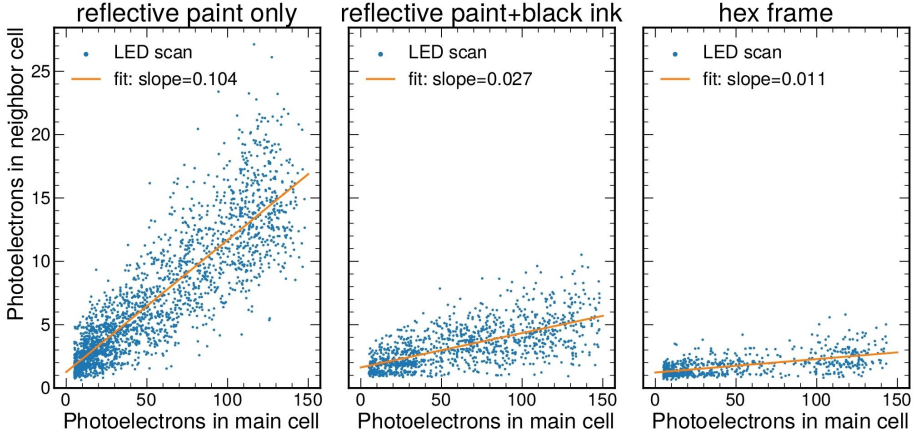








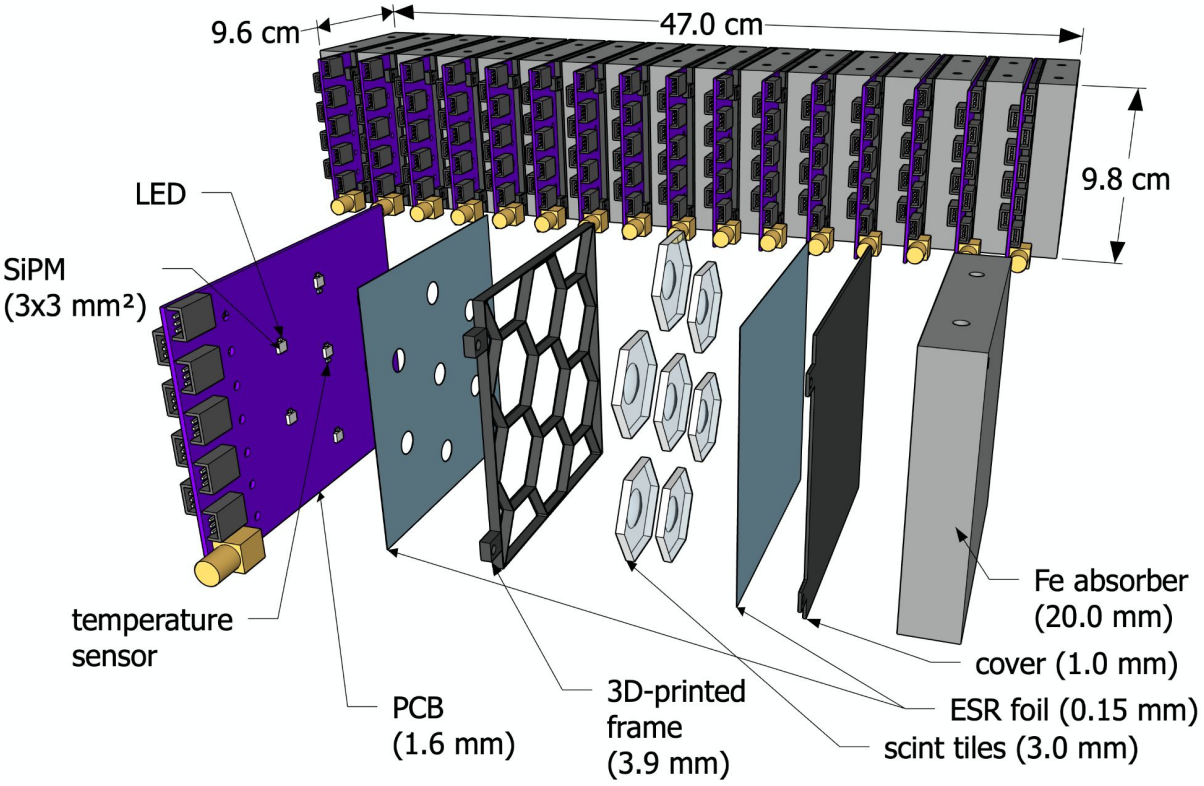




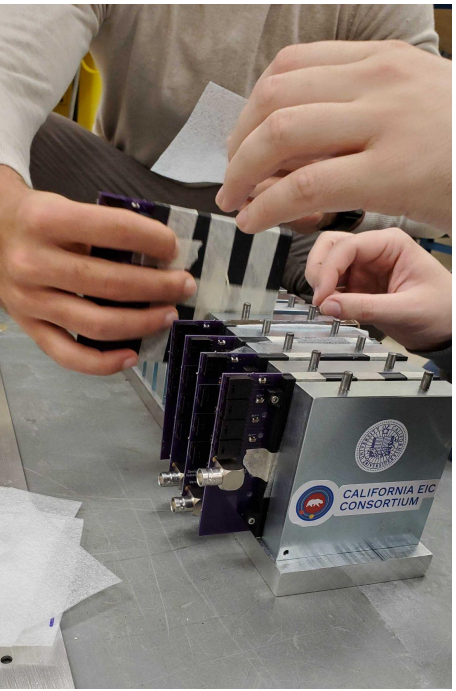
Paper in preparation

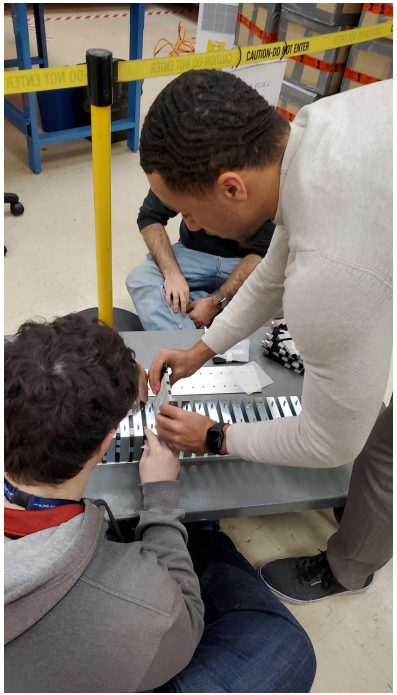
Characterization of scintillator cells for the calorimeter insert	*Miguel Rodriguez*
PAB 3-326, UCLA, Physics and Astronomy Building	09:45 - 09:55
Strontium-90 scanner for calorimeter insert cell-uniformity tests	*Samir Anup Kulkarni*
PAB 3-326, UCLA, Physics and Astronomy Building	09:55 - 10:05

We are aiming to built and test an “ECAL-size” prototype



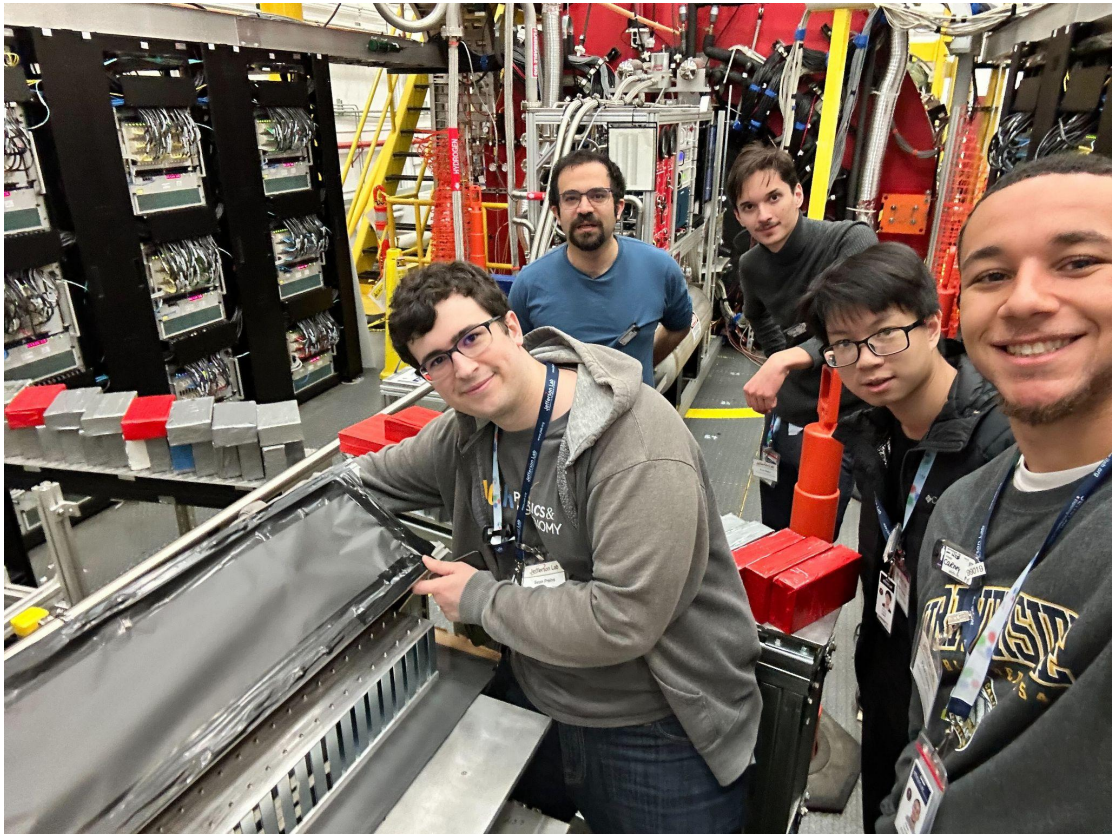
- ~10x10 cm2,
  18 X0 depth
  and 128 channels.
- Goal: test and learn about technology; polish construction capabilities


CALIFORNIA EIC
CONSORTIUM


CAUTION-DO NOT ENTER


Quick Installation Guide


CALIFORNIA EIC
CONSORTIUM



You'll hear more about it tomorrow

Construction of the first prototype of the calorimeter insert	*Peter Carney*	
PAB 3-326, UCLA, Physics and Astronomy Building	09:20 - 09:35	
Milling plastic scintillator cells for the calorimeter insert	*Bruce Bagby*	
PAB 3-326, UCLA, Physics and Astronomy Building	09:35 - 09:45	
Characterization of scintillator cells for the calorimeter insert	*Miguel Rodriguez*	
PAB 3-326, UCLA, Physics and Astronomy Building	09:45 - 09:55	
Strontium-90 scanner for calorimeter insert cell-uniformity tests	*Samir Anup Kulkarni*	
PAB 3-326, UCLA, Physics and Astronomy Building	09:55 - 10:05	
Readout for calorimeter insert prototype and studies with cosmic rays	*JiaJun Huang*	
PAB 3-326, UCLA, Physics and Astronomy Building	10:05 - 10:15	
Simulations for calorimeter insert beamtest (remote)	*Xilin Liang et al.*	
PAB 3-326, UCLA, Physics and Astronomy Building	10:15 - 10:25	
Coffee Break		
PAB 3-326, UCLA, Physics and Astronomy Building	10:25 - 10:45	
Results of first test beam of calorimeter insert at JLab	*Sean Preins et al.*	
PAB 3-326, UCLA, Physics and Astronomy Building	10:45 - 11:00	

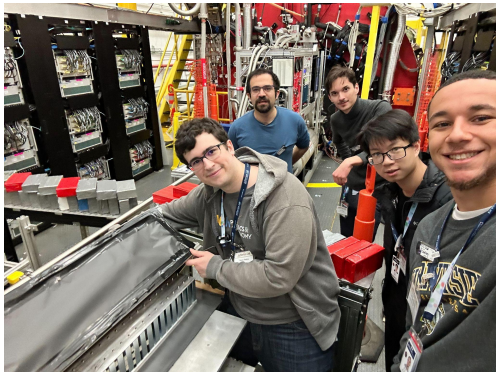
Next steps for insert prototype testing

2023

Jefferson Lab

Second round of testing in Hall-D, with 128 channel ECAL-size prototype

Exploring possibility in Hall B (tagged hadrons)



2023

BERKELEY LAB

SiPM irradiation testing @88'' cyclotron

2023

Fermilab

Together with UCLA's W/SciFi ECAL

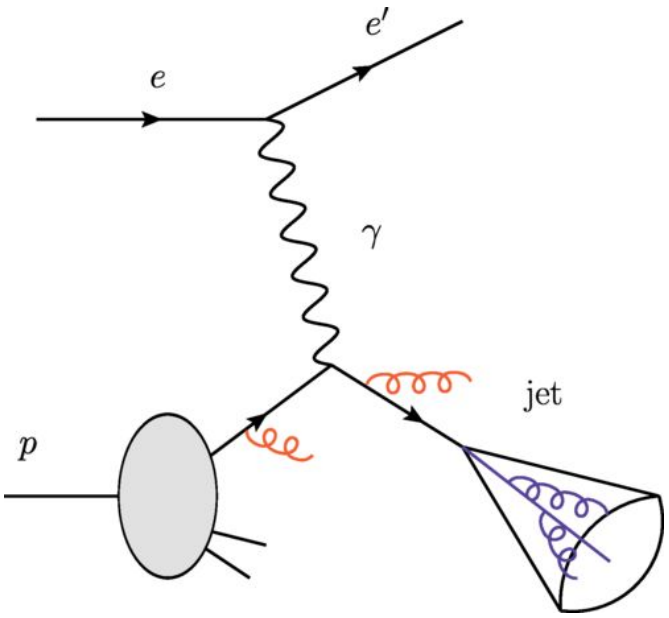
2024

Brookhaven National Laboratory

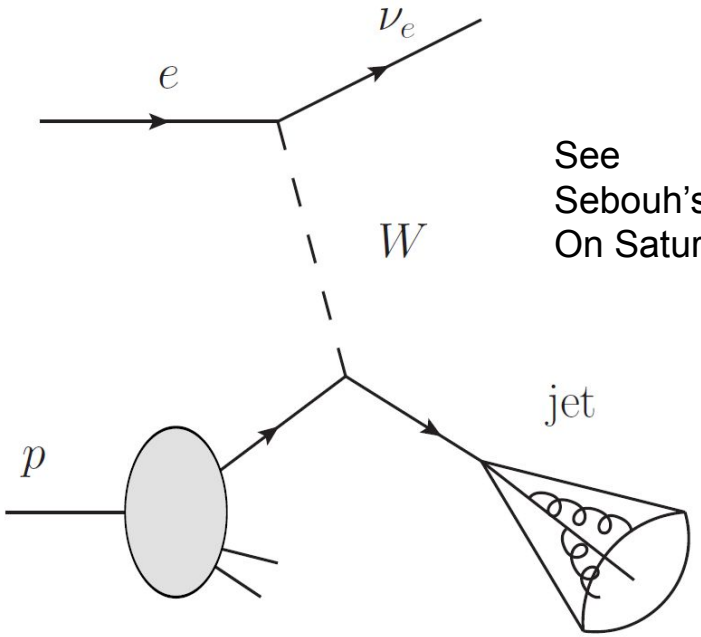
East-side of STAR near beam pipe.
Operate parasitically during 200 GeV pp run

New theory-exp collaboration with Kang et al.; paper submitted

"Jet-based measurements of Sivers and Collins asymmetries at the future electron-ion collider"
Phys. Rev. D 102, 074015



Neutrino-tagged jets at the Electron-Ion Collider
arXiv:2212.02432



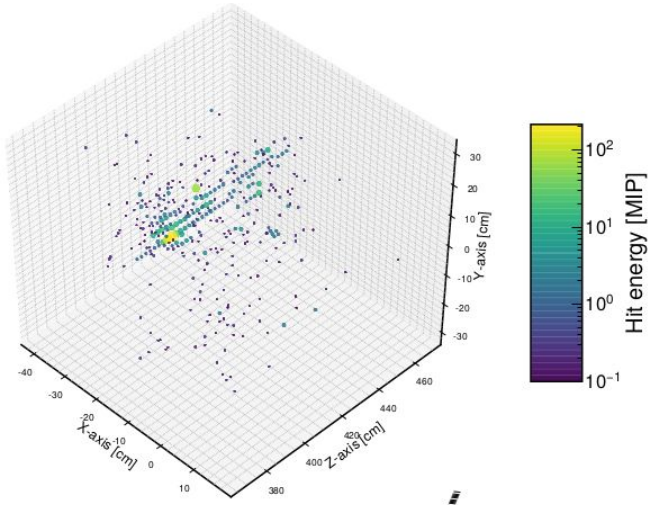
See Sebouh's talk On Saturday

Neutrino-jet correlations at the EIC (remote) *Sebouh Paul*

PAB 3-326, UCLA, Physics and Astronomy Building 12:50 - 13:10

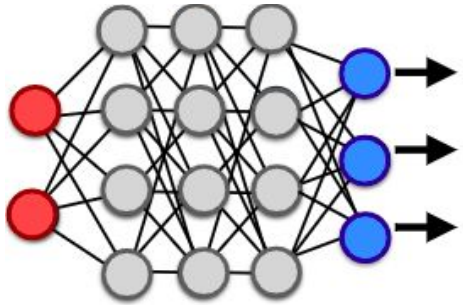
AI

We continue to collaborate with LLNL on AI research focused on EIC applications.
Optimization of calorimetry for EIC is our current focus (DOE supported).
New results since last meeting presented by Bishnu



AI performance with high-granularity calorimeter insert	*Bishnu Karki*
PAB 3-326, UCLA, Physics and Astronomy Building	11:00 - 11:15

We are seeking to strengthening and expanding such collaboration by including Kang et al.



EIC project R&D

- UCR joined “targeted R&D” eRD106 (forward ECAL)
  Looking forward to collaborate with UCLA in this effort.

- UCR joined “targeted R&D” eRD107 (forward HCAL)
  *unfunded.

- UCR part of 2022 “generic R&D” to develop
  muon/calorimeter system, which was funded.

Changes in team

- Weibin Zhang will be joining our team as a postdoc in ~February after his graduation from Stony Brook University.
  Will work 50% on EIC calorimetry, and 50% in STAR with Barish's group.

- Sebouh Paul (postdoc) will continue contributing to our EIC efforts, but now partially supported by JLab EIC center fellowship.

- Sean Preins (grad student) will continue contributing to our EIC efforts, but for the next 2 years supported by HEPCAT instrumentation fellowship.

- Ryan Milton (grad student) will be supported to work on EIC calorimetry

UCR EIC team in 2023

Undergraduate students;

[DOE traineeship]: Miguel Rodriguez, JiaJun Huang, Luis Garabito + 2 new in FY23

Peter Carney, Samuel Pare, Samir Kulkarni, Bruce Bagby

Graduate students:

Ryan Milton, Xilin Liang, Sean Preins [HEPCAT]

+ new student [EIC R&D]

Postdocs: Weibin Zhang (0.5 FTE) [MRPI] & STAR in Barish's group

Bishnu Karki (0.5 FTE) [DOE AI] & STAR in Barish's group

Sebouh Paul (0.5 FTE) [JLab EIC] & CLAS12 in Arratia's group

Faculty: Barish, Long, Seto, Arratia

Team might expand depending on outcome of pending grant applications

Summary

Our activities have been targeted to calorimeter insert project.

- Conceptual design paper published.
- Currently prototyping and converging on beam tests

+ Synergistic AI research in collaboration with LLNL

+ Synergistic jet-physics studies in collaboration with UCLA

"We will design these and attract construction funds to California"