

LLNL Status and Plans

UC-EIC Consortium Meeting

Monday August 21, 2023



Who we are

Heavy-ion Experiment



Ron Soltz
NACS DDL-ST
DOE-NP POC



Aaron Angerami
Staff



Dhanush Hangal
Staff

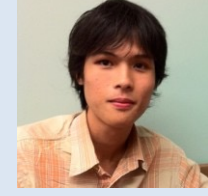


Ben Gilbert
Postdoc
(starting fall/winter)

Heavy-ion Theory

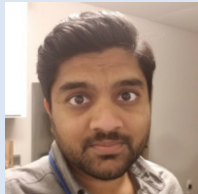


Ramona Vogt
Staff



Vincent Cheung
Postdoc

Data science



Piyush Karande
Staff
Data Science

Students

UC-EIC Traineeship undergraduate
students (with UC Riverside)



Experimental activities and plans

Experimental Collaborations

- ATLAS
 - Working Group Convener (Angerami)
 - Jet Sub-convener (Hangal)
- sPHENIX
- Jetscape
 - Deputy Spokesperson (Soltz)

Interests and Expertise

- Physics:
 - Jet quenching
 - Heavy flavor and quarkonia
 - UPCs and photoproduction
- Technical:
 - Software and computing
 - Jet reconstruction and calibration
 - Application of ML methods

EIC Topics

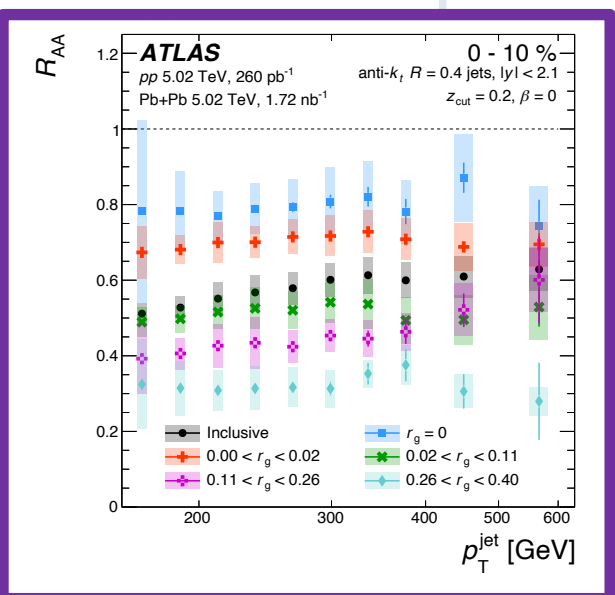
- AI-assisted detector design: project w/ LBL and UCR
- Photoproduction and diffraction with emphasis on complementarity to LHC program
- ML-enabled reconstruction and analysis improvements



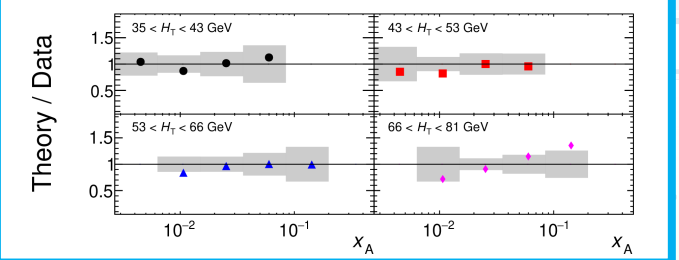
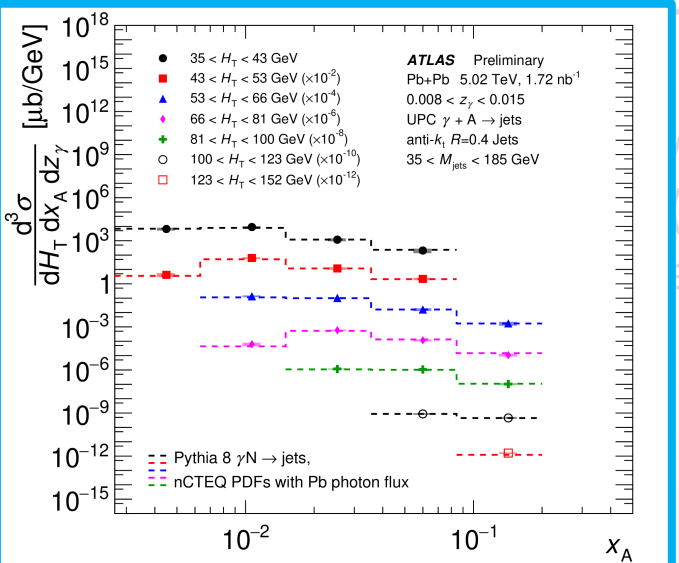
Experimental activities and plans

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R_{AA} for jets with different opening angles (r_g)
 ATLAS-CONF-2022-026



Jet cross sections in UPCs as a function of hard-scattering kinematics: $(x_A, H_T) \leftrightarrow (x, Q^2)$
 ATLAS-CONF-2022-021

design: project w/ LBL and UCR
 and diffraction with emphasis on complementarity to LHC program
 reconstruction and analysis improvements



Experimental activities and plans

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 - Trigger Coordinator (Hu)
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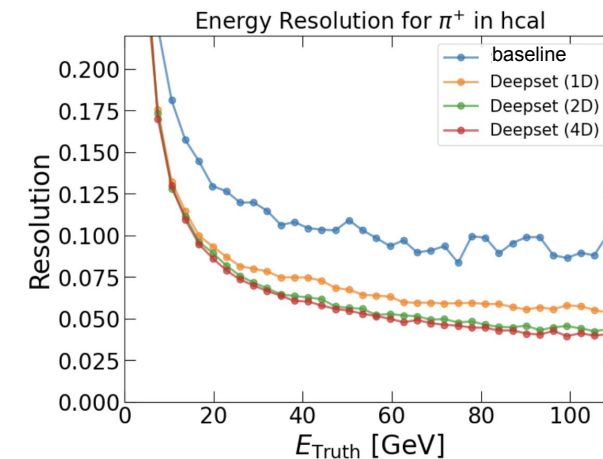
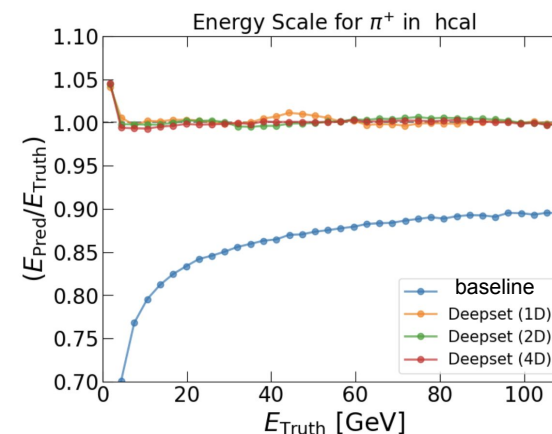
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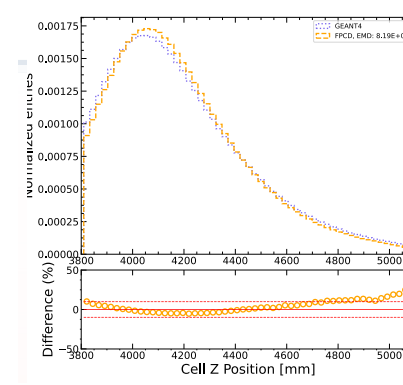
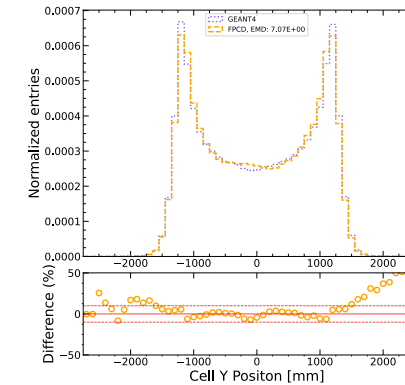
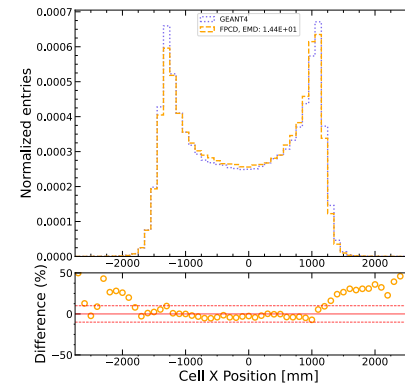
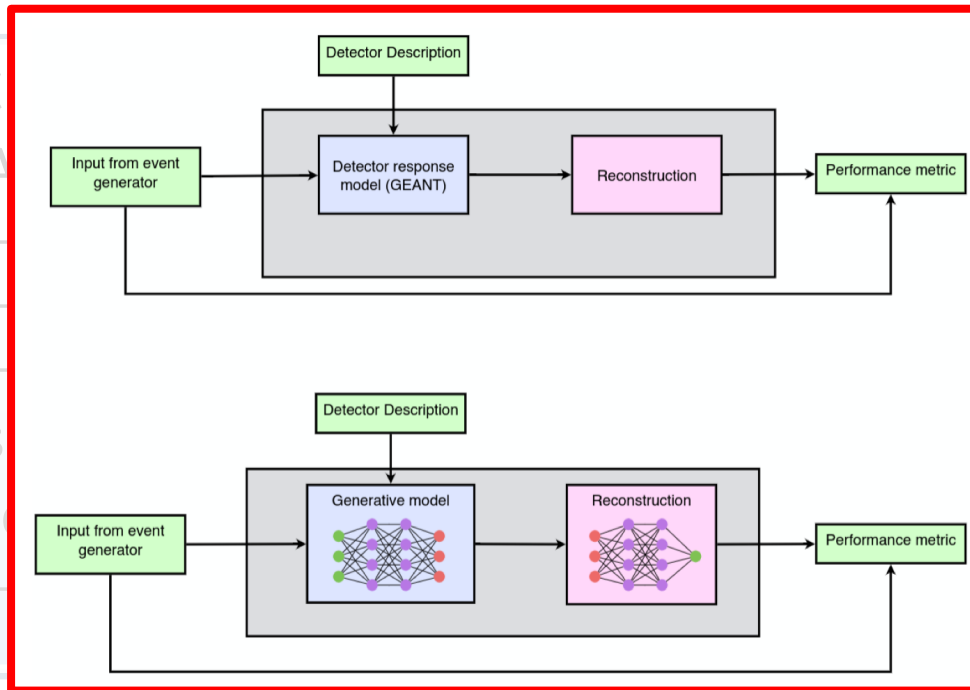
'El Capitan'

New exascale system at LLNL expected 2023



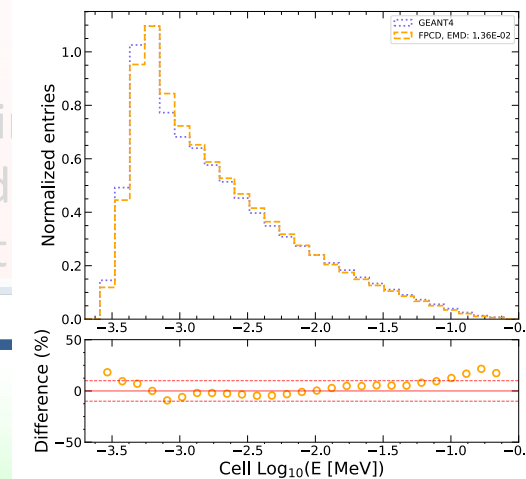
Energy scale and resolution for single pions using point-cloud methods

Experimental activities and plans



*Replacing traditional simulation studies (top) with co-optimized generative model and DNN-based reconstruction (bottom)
Applied to hadronic calorimetry at EIC*

[arXiv:2307.04780](https://arxiv.org/abs/2307.04780)



EIC Topics

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- **Photoproduction and diffraction with emphasis on complementarity to LHC program**
- **ML-enabled reconstruction and analysis improvements**

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