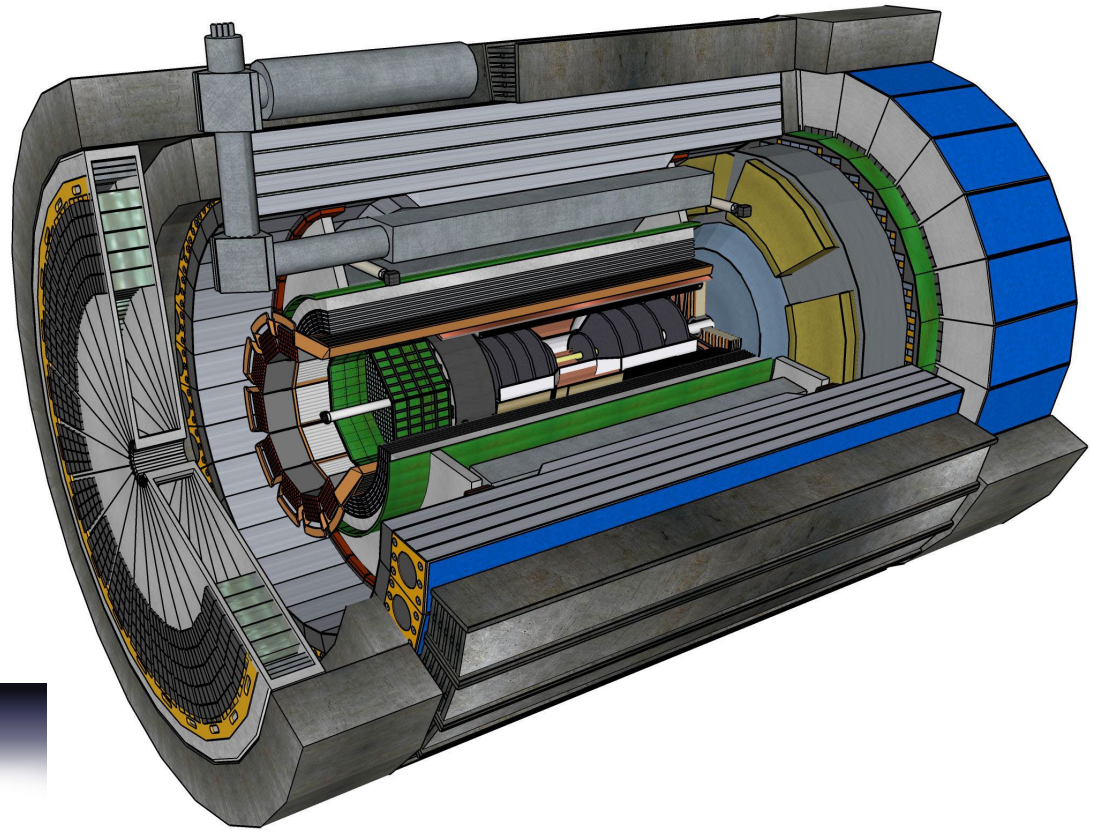
Collaboration Status

John Lajoie

Oak Ridge National Laboratory



2024 JAN 29-31 EIC Asia Workshop

CHiP

National Cheng Kung University
Department of Physics, Rm 36169(1F)
No.1, University Road, Tainan City, Taiwan

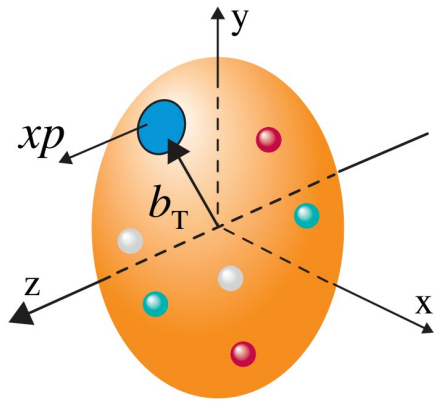
OAK RIDGE National Laboratory

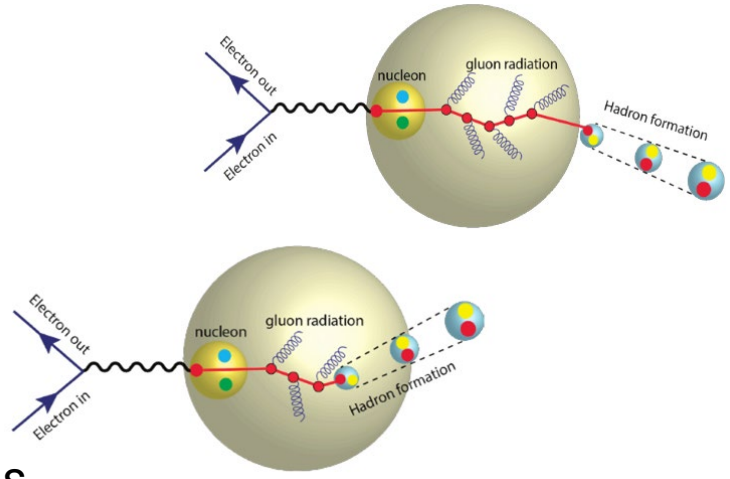
U.S. DEPARTMENT OF ENERGY
Office of Science

The Collaboration Pursues the Science

- How do the nucleon properties like mass and spin emerge from quarks and their interactions?

- How are the sea quarks and gluons distributed in space and momentum inside the nucleon? How is spin dynamically generated?



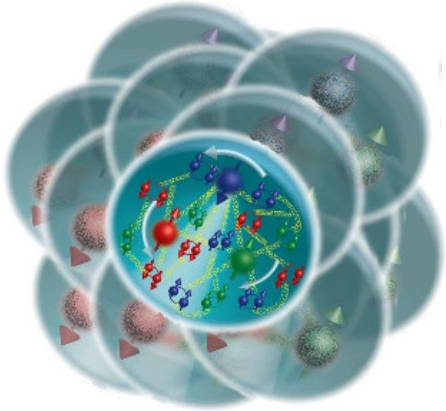


- In what manner do color-charged quarks and gluons, along with colorless jets, interact with the nuclear medium? And how do the confined hadronic states emerge from these quarks and gluons?

- What impact does a high-density nuclear environment have on the interactions, correlations, and behaviors of quarks and gluons?

s

- What is the mechanism through which quark-gluon interactions give rise to nuclear binding?

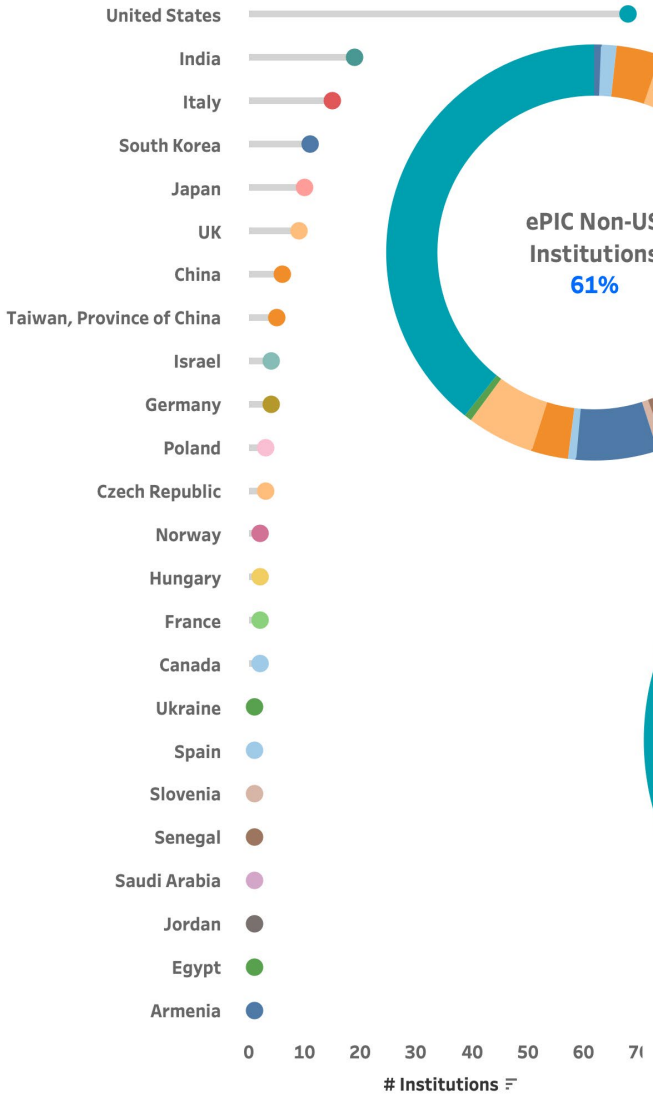


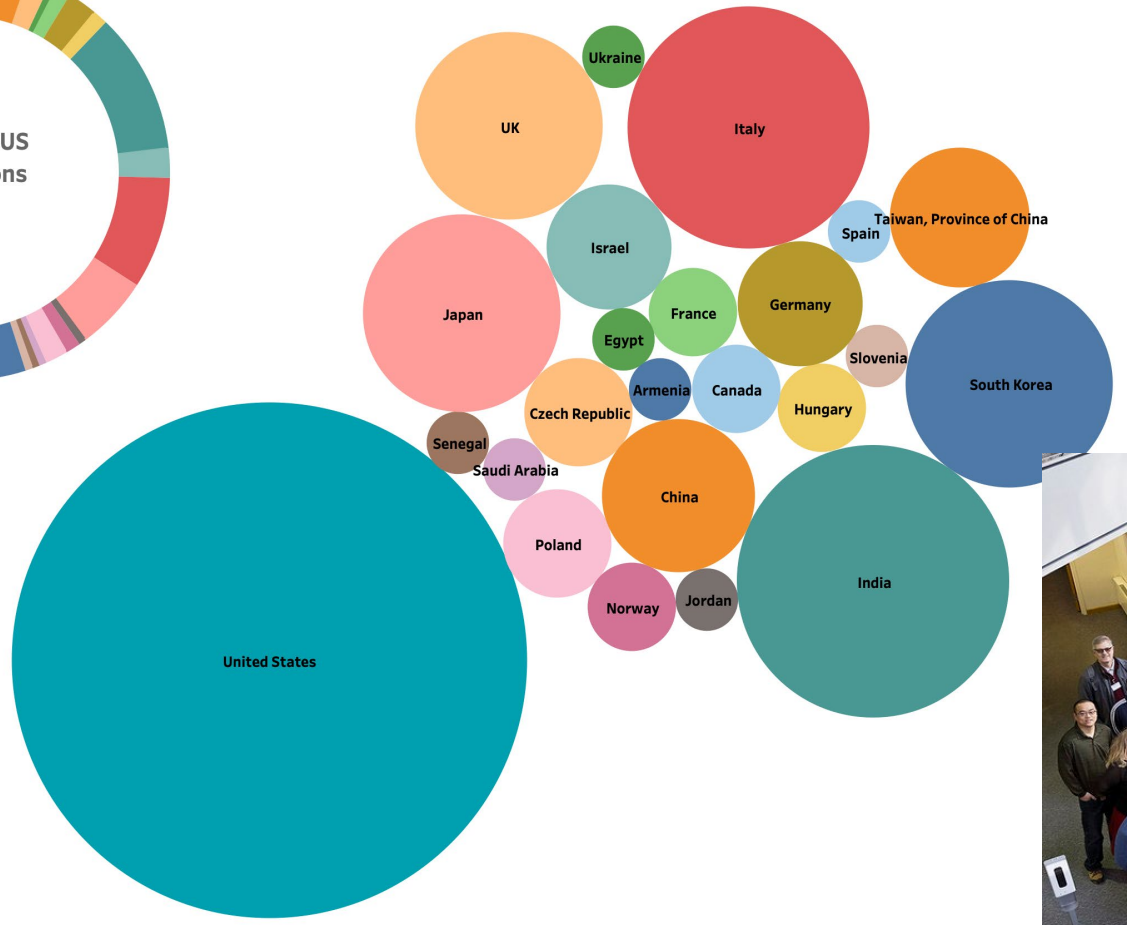
- Is there a saturation point for the density of gluons in nuclei at high energies, and does this lead to the formation of gluonic matter with universal properties across all nuclei, including the proton?

The ePIC Collaboration

171 institutions (Jan 2024)
24 countries

A truly global pursuit for the first experiment at the EIC!





The ePIC Collaboration

171 institutions (Jan 2024)
24 countries

United States

Taiwan, P

0 10 20 30 40 50 60 7(

Institutions

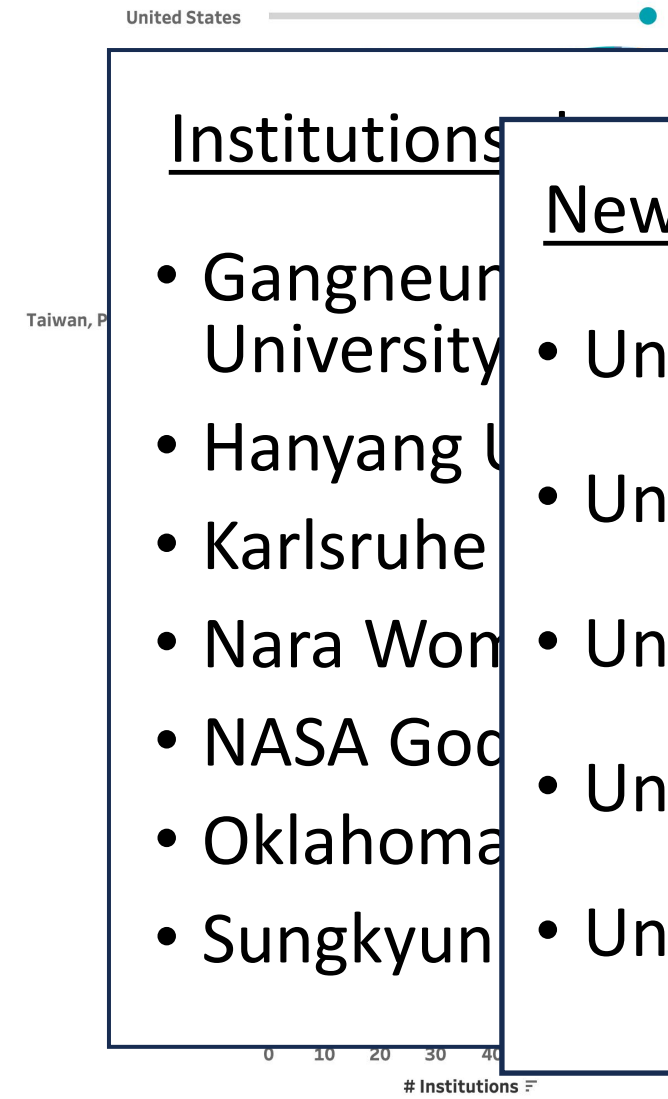
Institutions that Joined ePIC in 2023:

- Gangneung-Wonju National University
- Hanyang University
- Karlsruhe (ADL)
- Nara Women's University
- NASA Goddard
- Oklahoma State
- Sungkyunkwan University

- The Ohio State
- University of Debrecen
- University of Liverpool
- University of Seoul
- University of Tokyo (CNS)
- Yonsei University

The ePIC Collaboration

171 institutions (Jan 2024)
24 countries



Institutions

- Gangneun University
- Hanyang U
- Karlsruhe
- Nara Wom
- NASA Goc
- Oklahoma
- Sungkyun

New Institutions Applying for ePIC Membership:

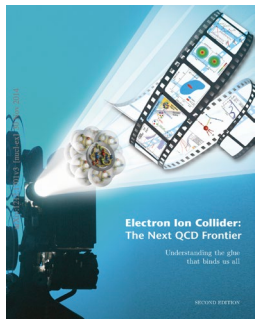
- University of Texas at Austin
- University Mohammed V in Rabat
- University Ibn Tofail in Kénitra
- University Mohammed Premier in Oujda
- University Mohammed VI in Bengurir

UNIVERSITY of DEBRECEN

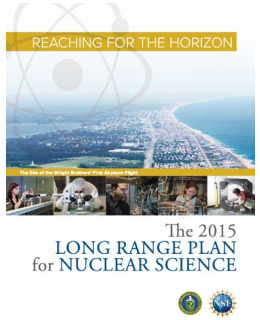
UNIVERSITY OF LIVERPOOL

NS)

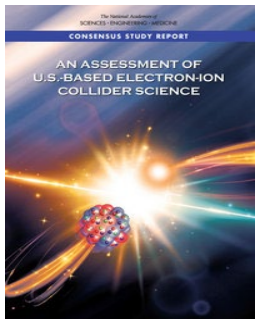
A Brief Timeline



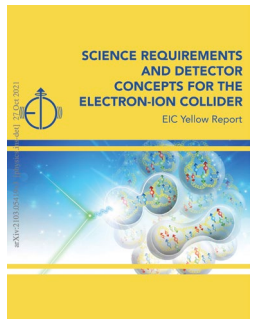
2012



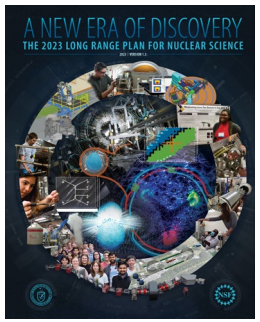
2015



2018



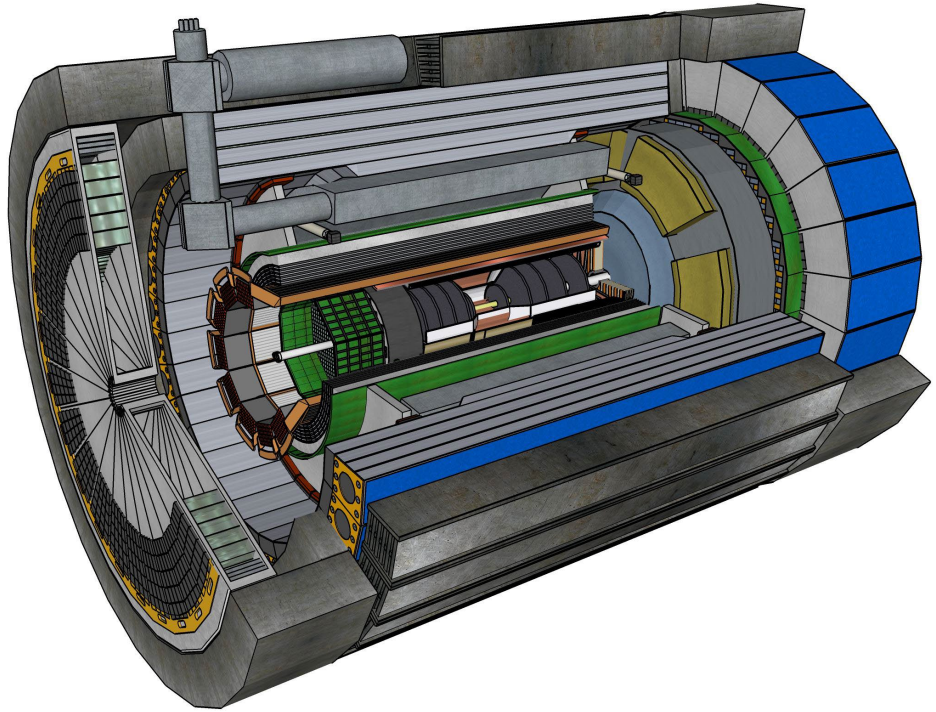
2020



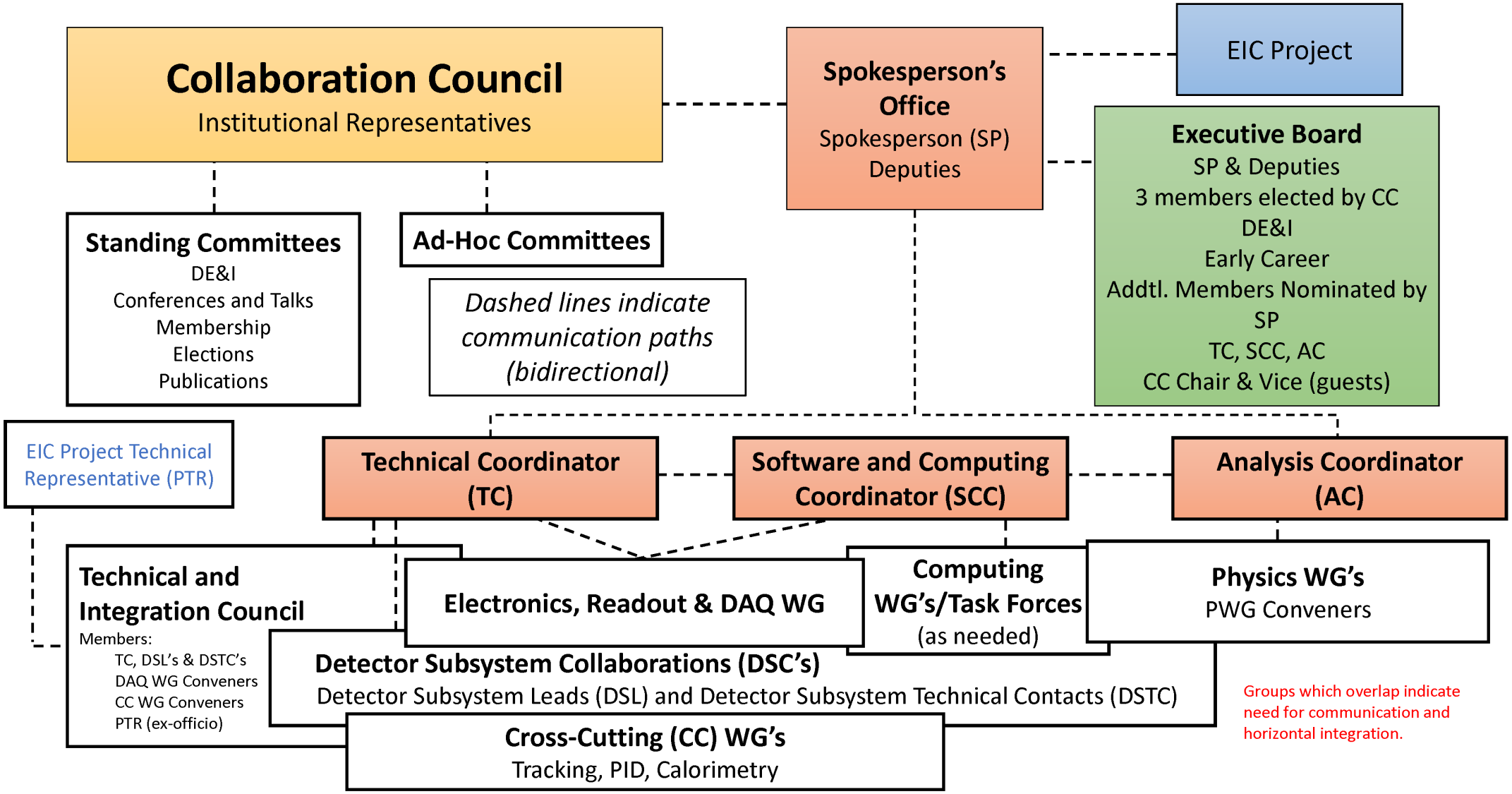
2023

Detector and machine design parameters driven by physics objectives

- Call for proposals issued jointly by BNL and JLab in **March 2021** (Due Dec 2021)
  - ATHENA, CORE and ECCE proposals submitted
- DPAP review **Dec 2021 – Jan 2022**, closeout **March 2022**
  - ECCE proposal chosen as basis for first EIC detector reference design
- **Spring/Summer 2022** – ATHENA and ECCE form joint leadership team
  - Joint WG's formed and consolidation process undertaken
  - Coordination with EIC project on development of technical design
- Collaboration formation process started **July 2022**
- Charter ratified & elected ePIC Leadership Team **February 2023**
- **EIC/ePIC endorsed as highest priority for new facility construction in 2023 LRP**



ePIC Collaboration Structure

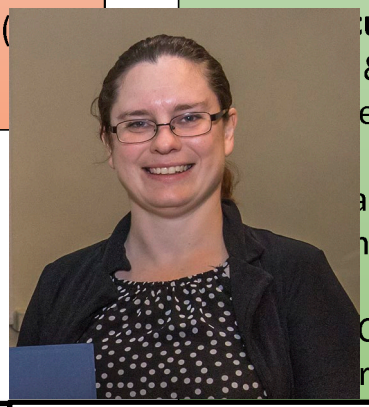


ePIC Collaboration Structure

Collaboration Council
Institutional Representatives

Spokesperson's Office
Deputies

EIC Project



Ad-Hoc Commi

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Technical Coordinator (Acting)
- Silvia Dalla Torre (INFN)
- Deputy TC's:
  Prakhar Garg (Yale)
  Oskar Hartbrich (ORNL)
  Matt Posik (Temple)

SCC Coordinator
- Markus Diefenthaler (JLab)
- Wouter Deconinck
  (U. of Manitoba,
  Deputy SCC for Operations)
- Sylvester Joosten
  (ANL, Deputy SCC for Development)
- Torre Wenaus
  (BNL, Deputy SCC for Infrastructure)

Analysis Co-Coordinators
- Rosi Reed (Lehigh Univ.)
- Salvatore Fazio (Univ. Calabria)

Physics WG's
PWG Conveners

Members:
TC, DSL's & DSTC's
DAQ WG Conveners
CC WG Conveners
PTR (ex-officio)

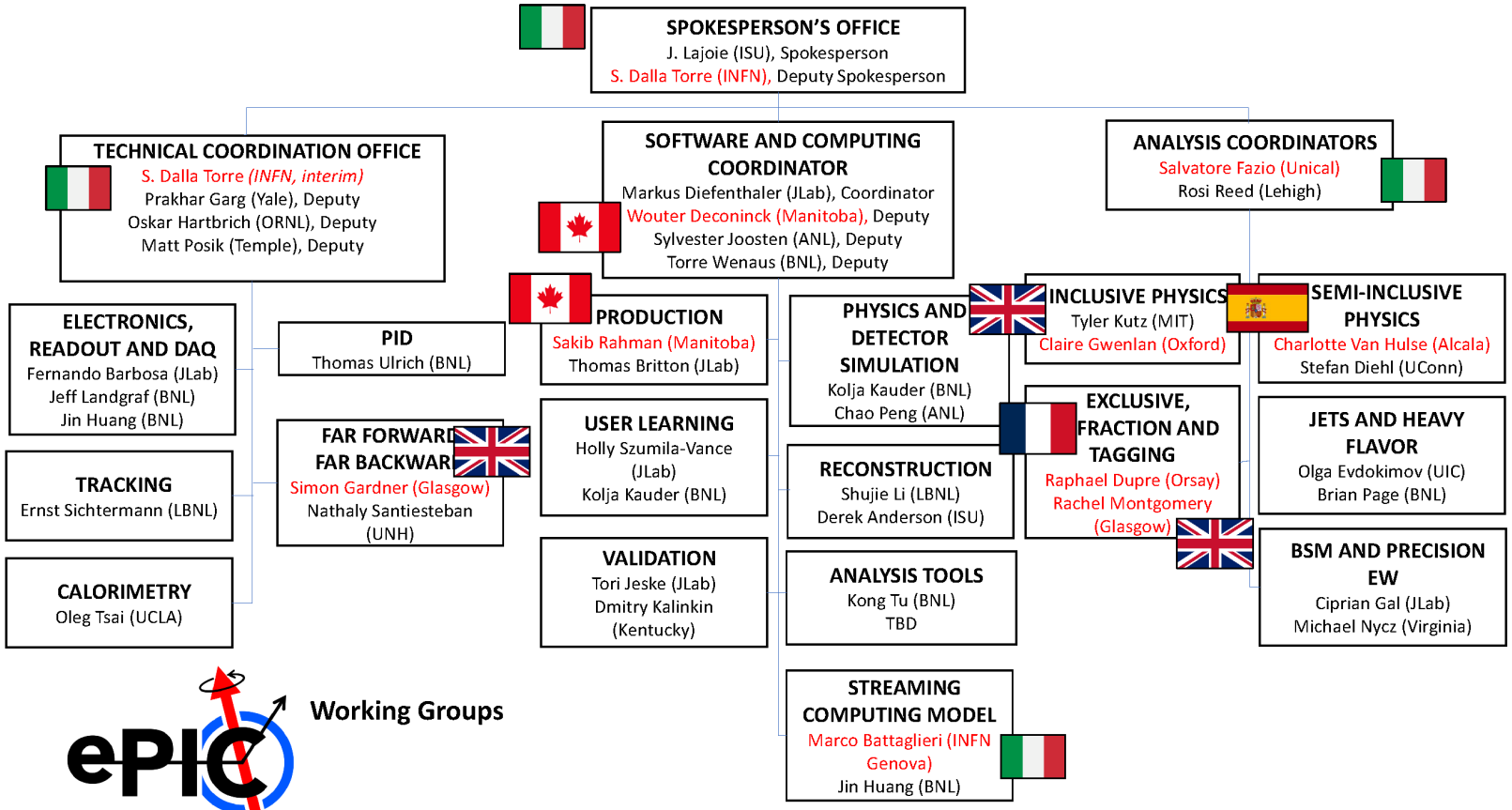
Detector Subs
Detector Subsys

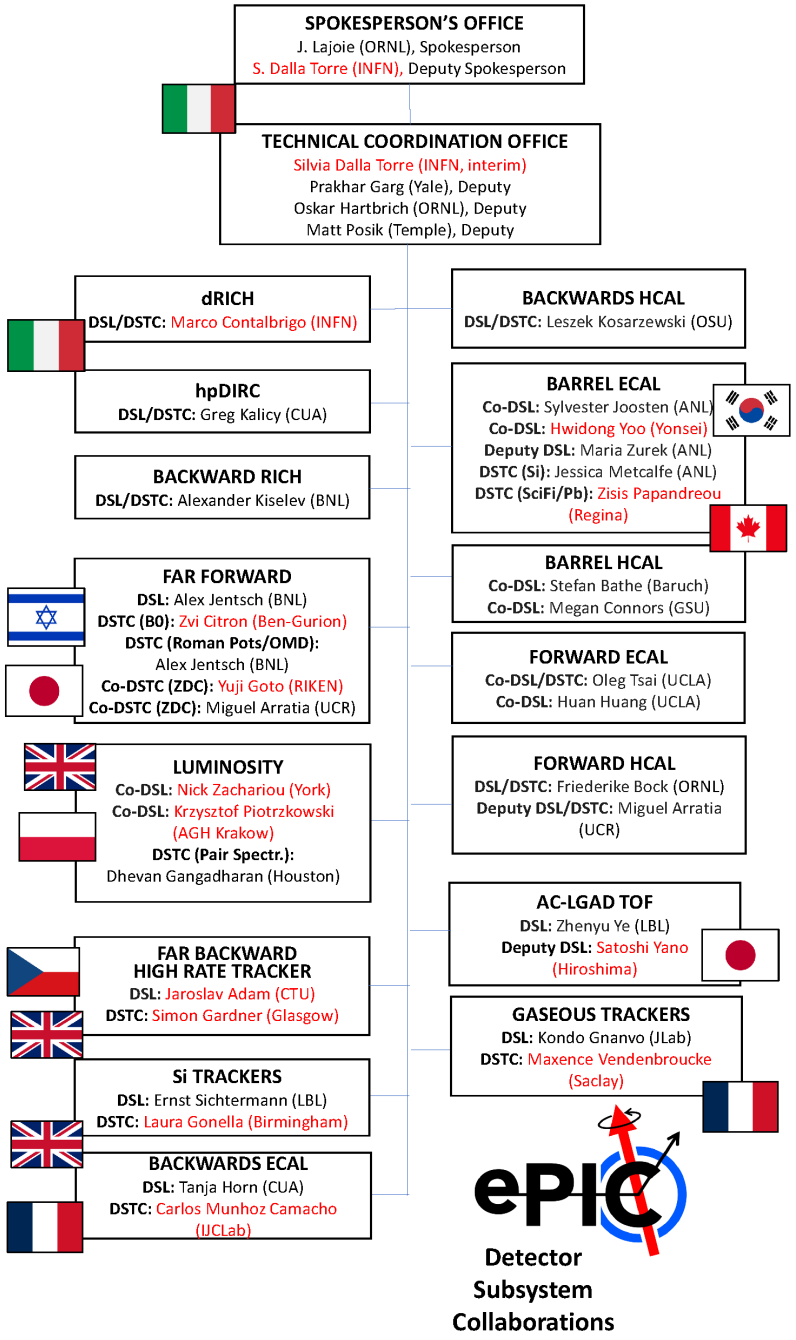
Cross-Cutting (CC) WG's
Tracking, PID, Calorimetry

cal Contacts (DSTC)

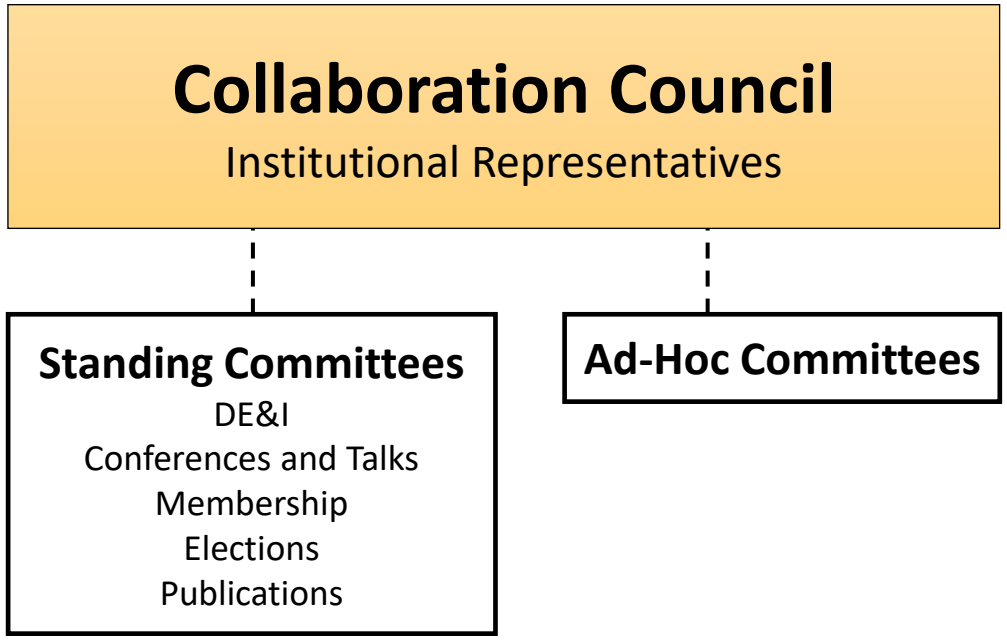
Groups which overlap indicate need for communication and horizontal integration.

ePIC Collaboration Structure





Newly Formed ePIC Committees



Committee Chair/Vice-Chair elected by Collaboration Council. Chair/Vice-Chair propose committee membership, endorsed by CC vote.

Elections Committee:
Chair: John Arrington (LBL)
Helen Caines (Yale), Or Hen (MIT),
Domenico Elia (INFN)

Newly Formed ePIC Committees

Collaboration Council
Institutional Representatives

Standing Committees
DE&I
Conferences and Talks
Membership
Elections
Publications

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committee formation underway

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committee formation underway

Publications Committee:
Chair: Rene Bellwied (U. Houston)
Vice –Chair: Annalisa Mastroserio (INFN Bari)
committee formation underway

ePIC Executive Board

The EB provides input to the Spokespersons on physics policy, instrumentation choices, and candidate suggestions for leadership positions. In addition to the 3 at-large members who will be elected by the Collaboration Council (CC), two members will be selected by the early-career group and the DEI committee. The Spokespersons can appoint additional members after endorsement by the CC. It is expected that top level activity coordinators will be members of the EB.

"From the perspective of the Spokesperson, it is essential to have an advisory body that represents the breadth of the collaboration that can be consulted on a regular basis. The real benefit comes when facing major decisions or crises – the Executive Board guarantees that the Spokesperson will receive recommendations and advice that enables a consideration of all perspectives within the collaboration. An Executive Board can help support the Spokesperson's office by endorsing decisions after careful consideration, or more importantly, forcing the Spokesperson's office to adequately consider aspects that might not have been part of their original considerations.

From the perspective of the Collaboration, it creates a body where the membership is known and deliberately balanced by the CC process and the SP nominations. The Collaboration knows who is on the Executive Board and advising the Spokesperson's Office on key decisions, which provides transparency. Of course, major decisions (like technology selections) will go before the CC for endorsement, but whatever is brought before the CC must be well considered and worked out beforehand. The Executive Board is key to that process."

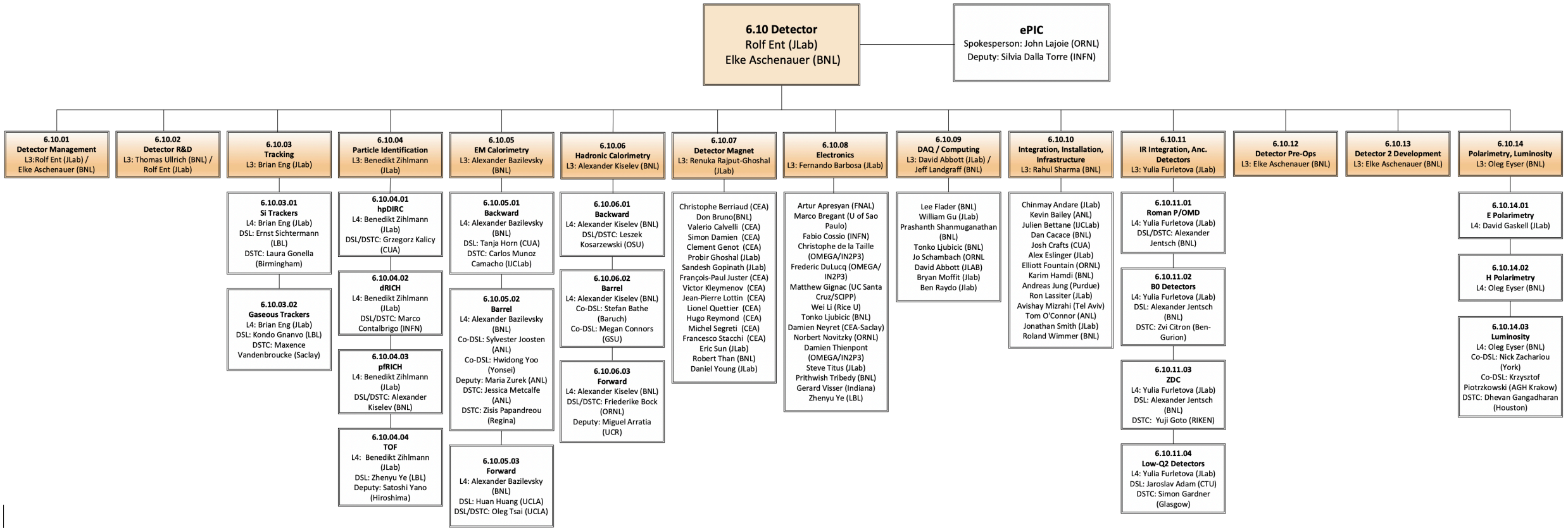
Spokesperson's Office
Spokesperson (SP)
Deputies

Executive Board
SP & Deputies
3 members elected by CC
DE&I
Early Career
Addtl. Members Nominated by SP
TC, SCC, AC
CC Chair & Vice (guests)

At-large members:
Barbara Jacak (Berkeley), Taku Gunji (Tokyo),
Paul Newman (U. of Birmingham)
DEI member: Megan Connors (GSU)
Early Career member: Fernando Flor (Yale U.)
Top level coordinators: Markus Diefenthaler (JLab), Salvatore Fazio (Calabria), Rosi Reed (Lehigh U.), TC (vacant)
CC chair and vice-chair (non-voting): Ernst Sichtermann (LBNL), Bernd Surrow (Temple U.)

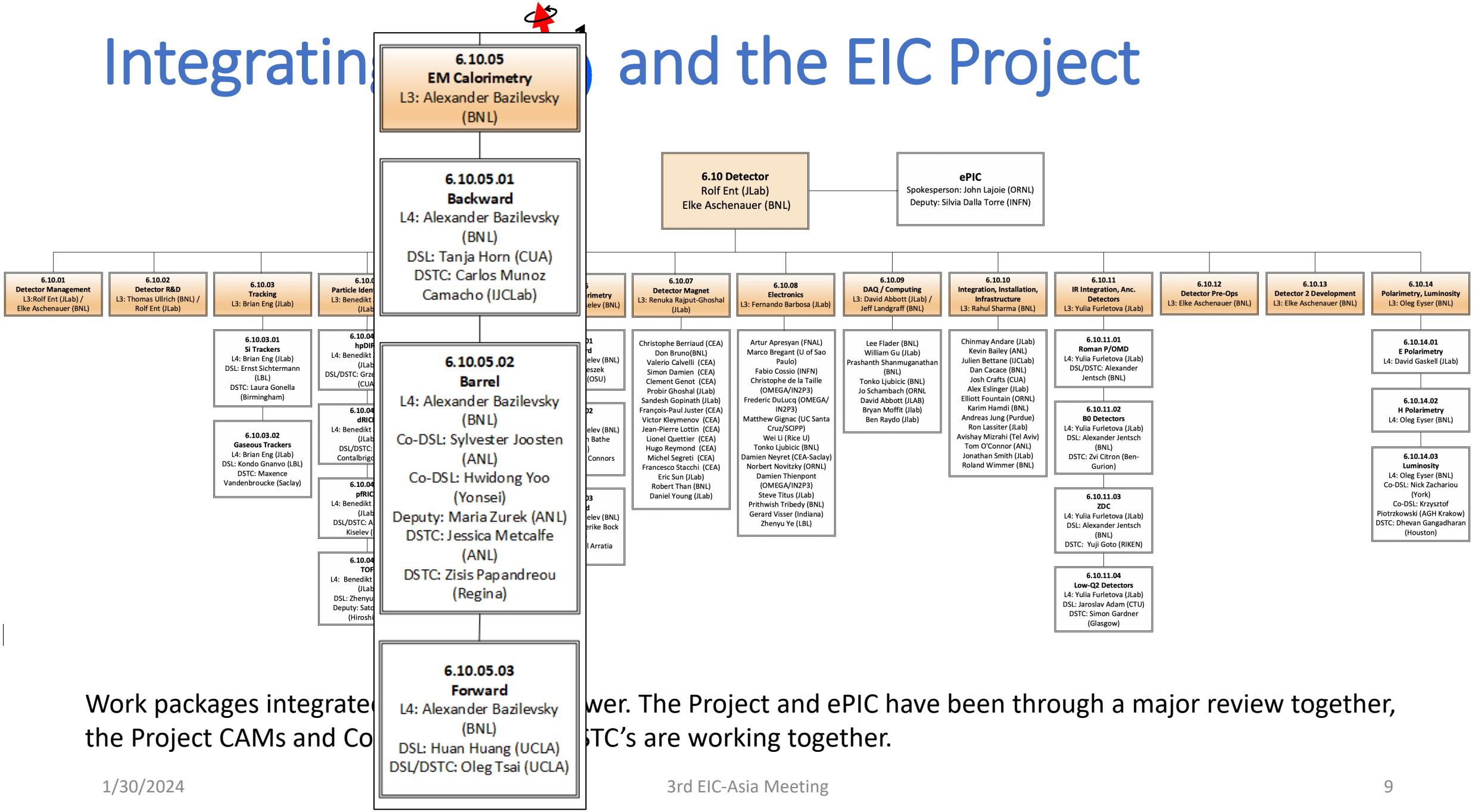
First EB Meeting Nov. 17th, planning to meet ~monthly

Integrating ePIC and the EIC Project



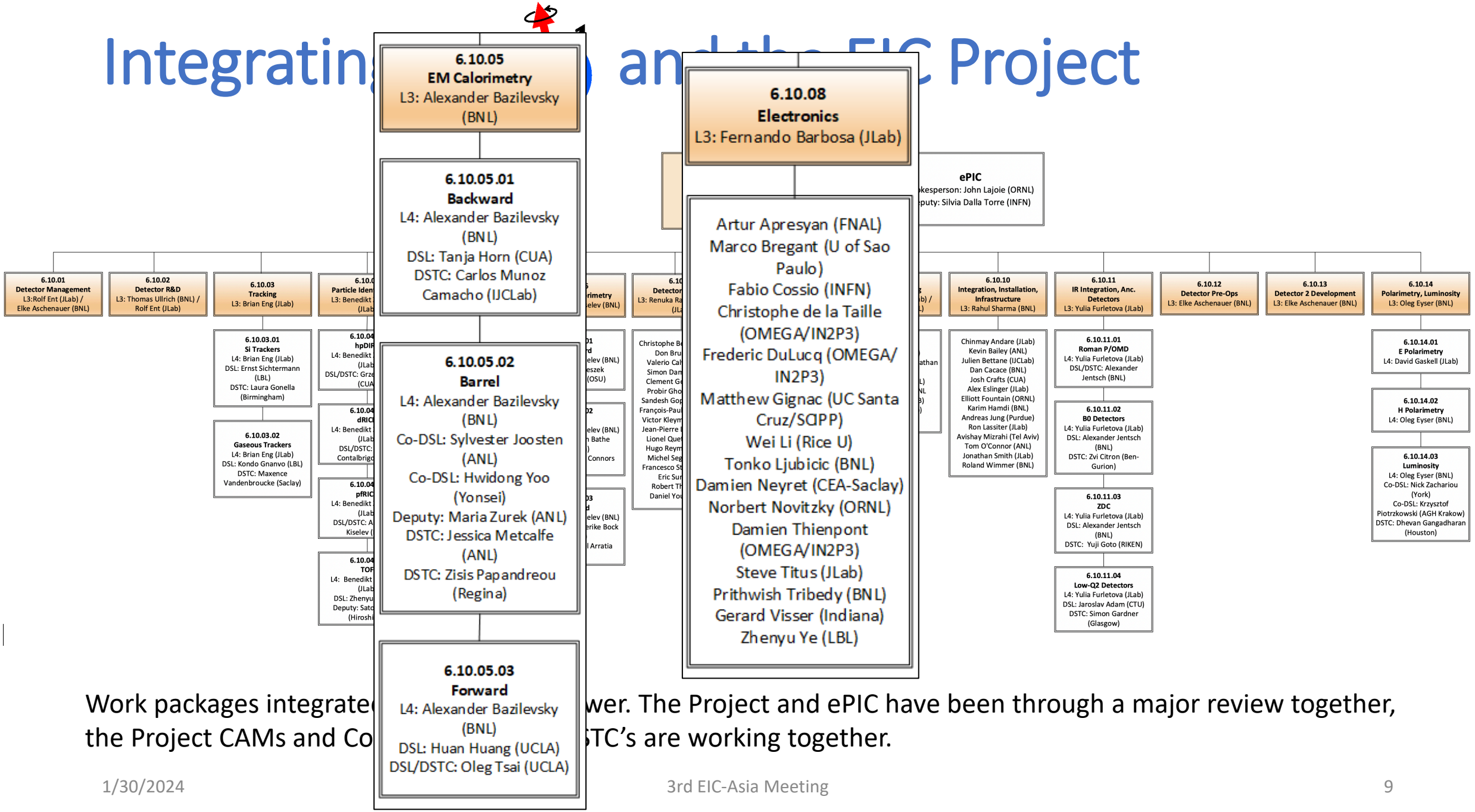
Work packages integrated at Level-5 and lower. The Project and ePIC have been through a major review together, the Project CAMs and Collaboration DSL/DSTC's are working together.

Integratin and the EIC Project



Work packages integrate wer. The Project and ePIC have been through a major review together, the Project CAMs and Co TC's are working together.

Integrating ( ) and the EIC Project



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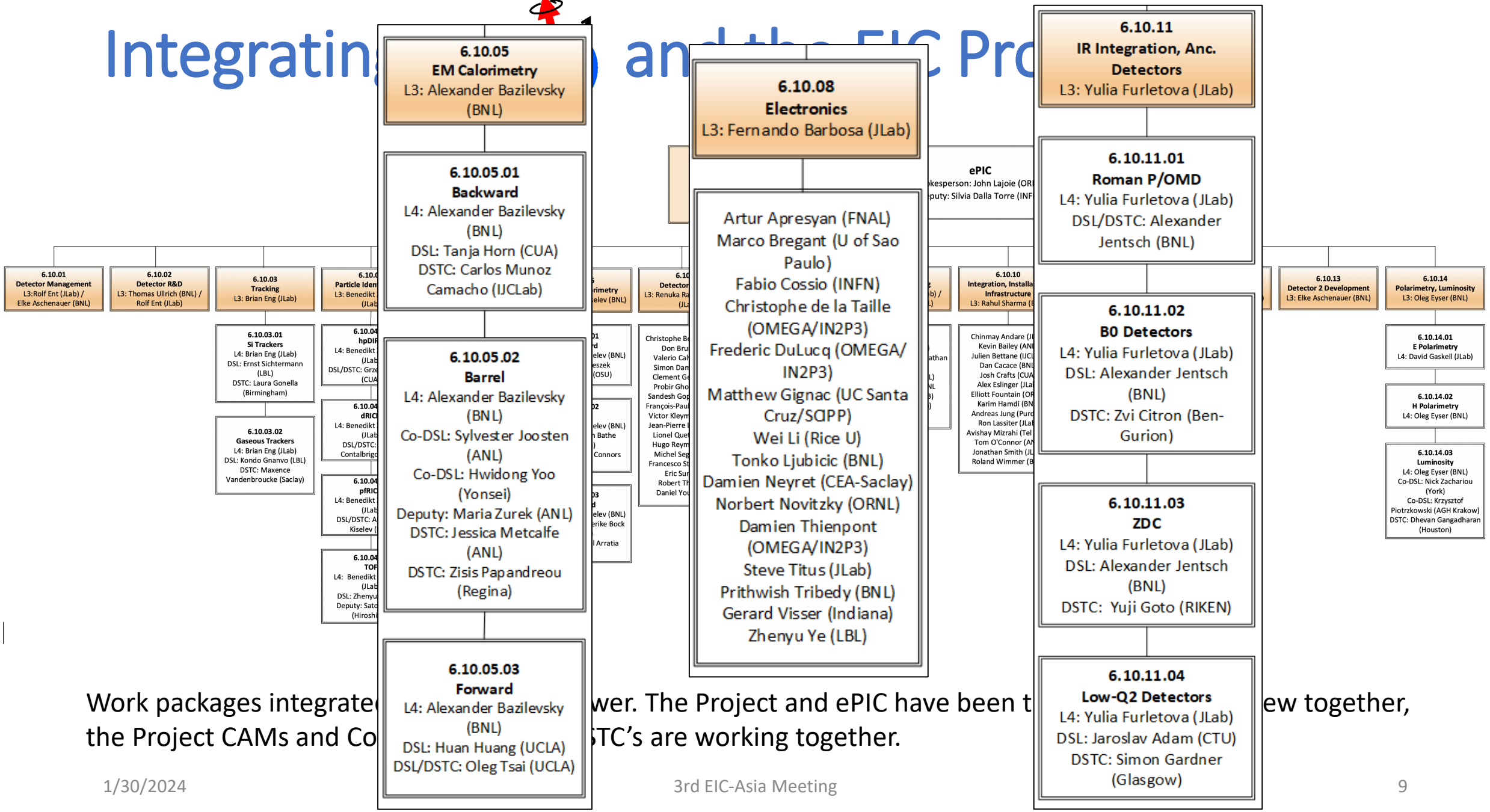
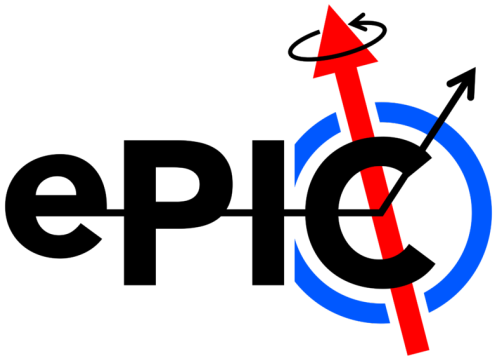
Integrating ( ) and the EIC Pro



Work packages integrate wer. The Project and ePIC have been t ew together, the Project CAMs and Co TC's are working together.

Recent Progress:

- August 28 + 31: DAC Review of Detector R&D
- August 29 + 30: ePIC Comprehensive Design Review by DAC
- September 13: SciFi Applications Final Design Review (LLP)
- September 14: SiPM Applications Final Design Review (LLP)
- September 25: Final Design Review Forward HCAL W & Steel (LLP)
- October 5-6: Final Design Review of Magnet (MARCO)
- October 10-12: DOE CD-3A Director's Review
- October 19-20: ePIC Computing Model Review
- November 14-16: DOE CD-3A Independent Project Review
- December 7 + 8: 2nd Resource Review Board meeting @ CUA
- December 11: SP Office Meeting with DOE NP
- … *plus countless DSC, WG and TIC meetings where the work is done*



EIC Detector Requirements

Radius/Distance from IP

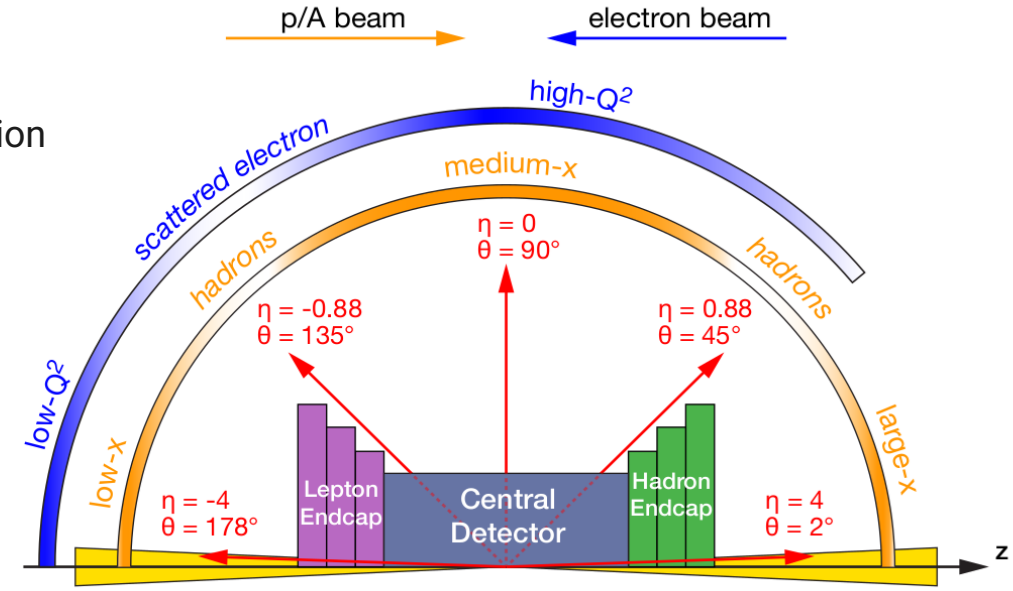
Vertex detector → Identify primary and secondary vertices,
- Low material budget: 0.05% X/X_0 per layer
- High spatial resolution: 20 μm pitch CMOS Monolithic Active Pixel Sensor

Central and Endcap tracker → High precision low mass tracking
- MAPS – tracking layers in combination with micro pattern gas detectors

Particle Identification → High performance single track PID for π, K, p separation
- RICH detectors (RICH, DIRC)
- Time-of-Flight high resolution timing detectors (HRPPDs, LGAD)
- Novel photon sensors: MCP-PMT / HRPPD

Electromagnetic calorimetry → Measure photons (E, angle), identify electrons
- $PbWO_4$ Crystals (backward), W/ScFi (forward)
- Barrel Imaging Calorimeter (Si + Pb/ScFi)

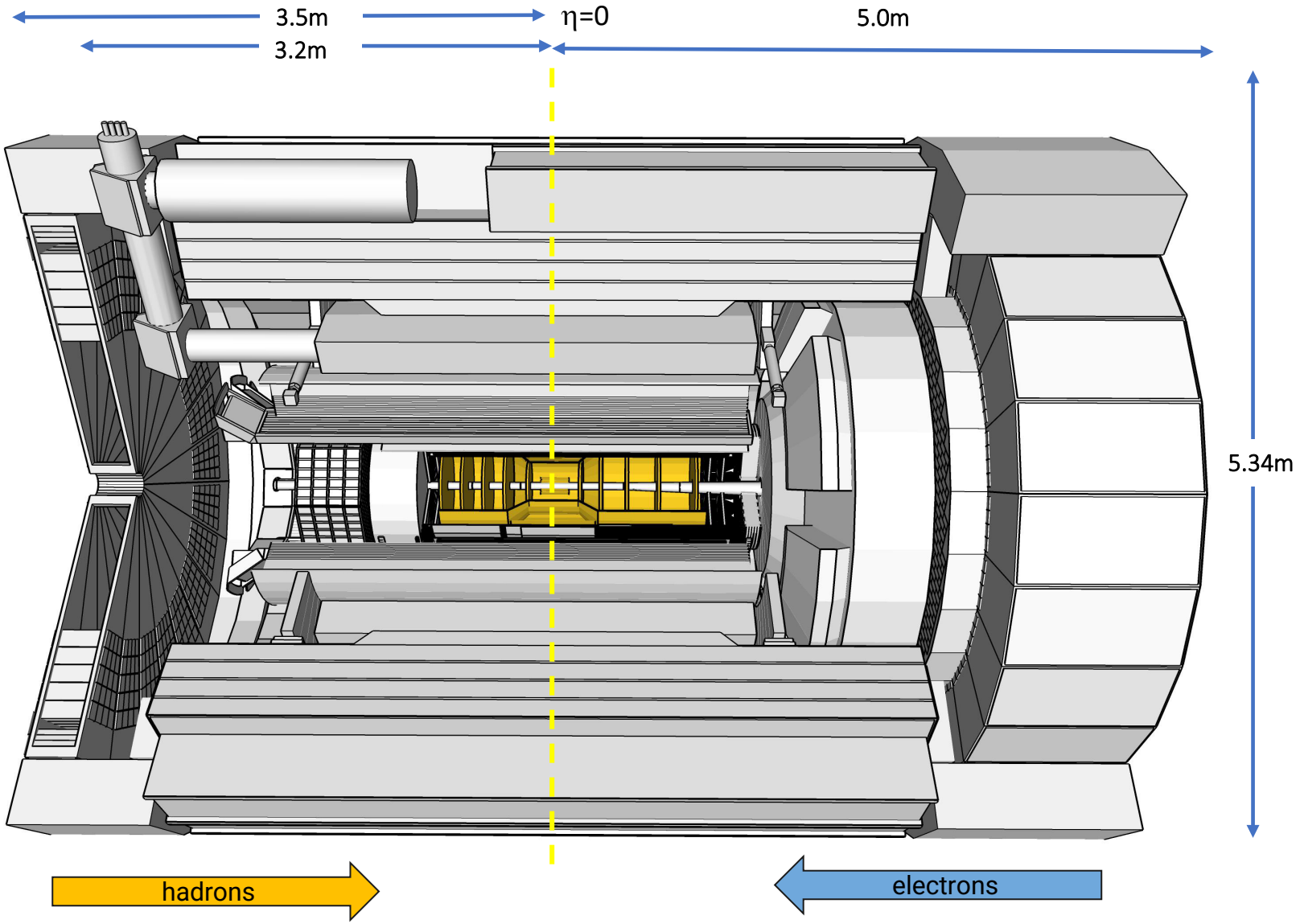
Hadron calorimetry → Measure charged hadrons, neutrons and K_L^0
- Achieve ~70%/√E + 10% for low E hadrons (~ 20 GeV)
- Fe/Sc sandwich with longitudinal segmentation



Very forward and backward detectors → Large acceptance for diffraction, tagging, neutrons from nuclear breakup
- Silicon tracking layers in lepton and hadron beam vacuum
- Zero-degree high resolution electromagnetic and hadronic calorimeters

DAQ & Readout Electronics → trigger-less / streaming DAQ, Integrate AI into DAQ

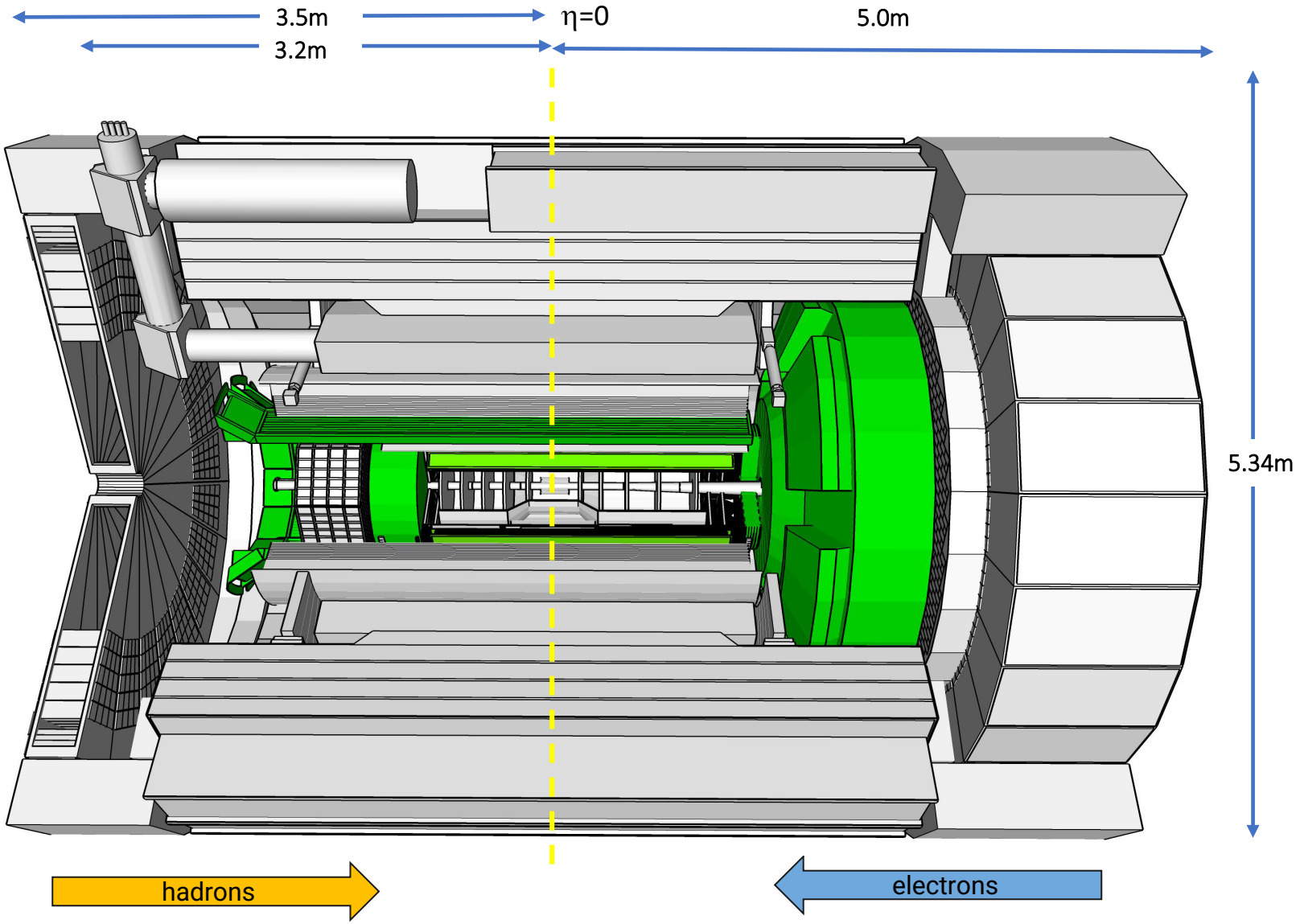
ePIC Detector Design



Tracking:

- New 1.7T solenoid
- Si MAPS Tracker
- MPGDs (μRWELL/μMegas)

ePIC Detector Design



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- New 1.7T solenoid
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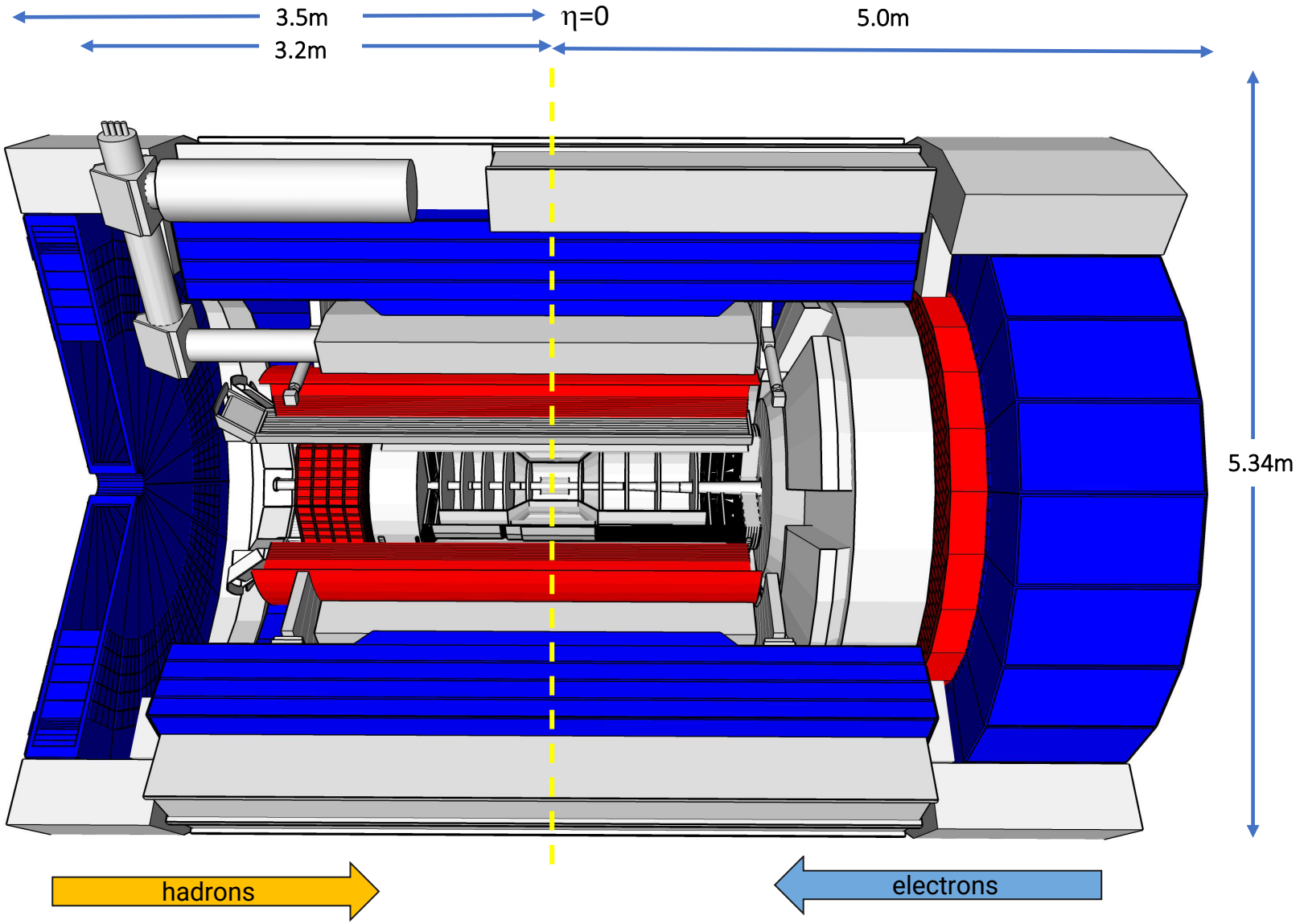
PID:

- hpDIRC
- pfRICH
- dRICH
- AC-LGAD (~30ps TOF)

ePIC Detector Design



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PID:

- hpDIRC
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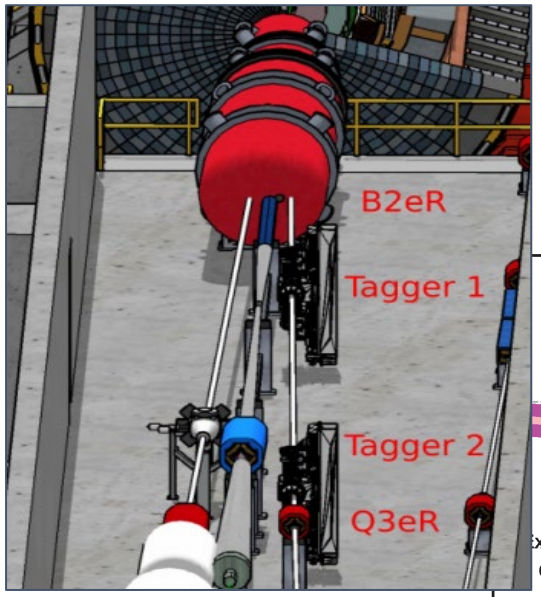
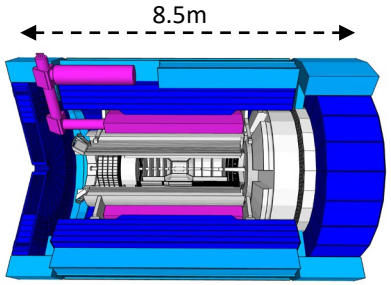
- AC-LGAD (~30ps TOF)

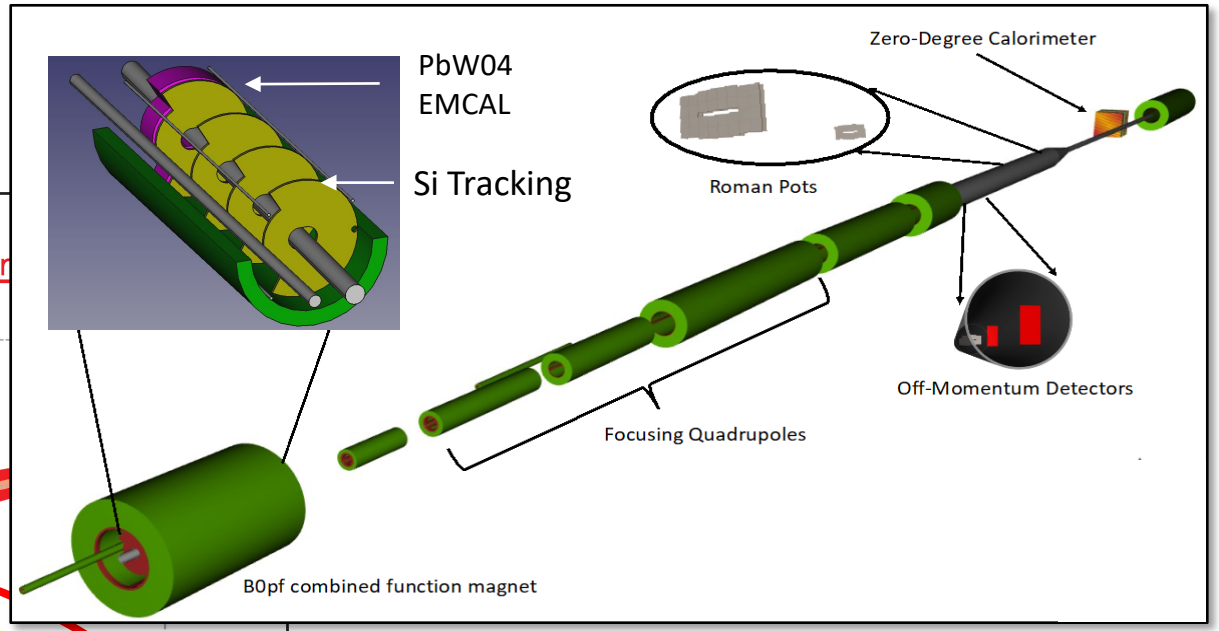
Calorimetry:

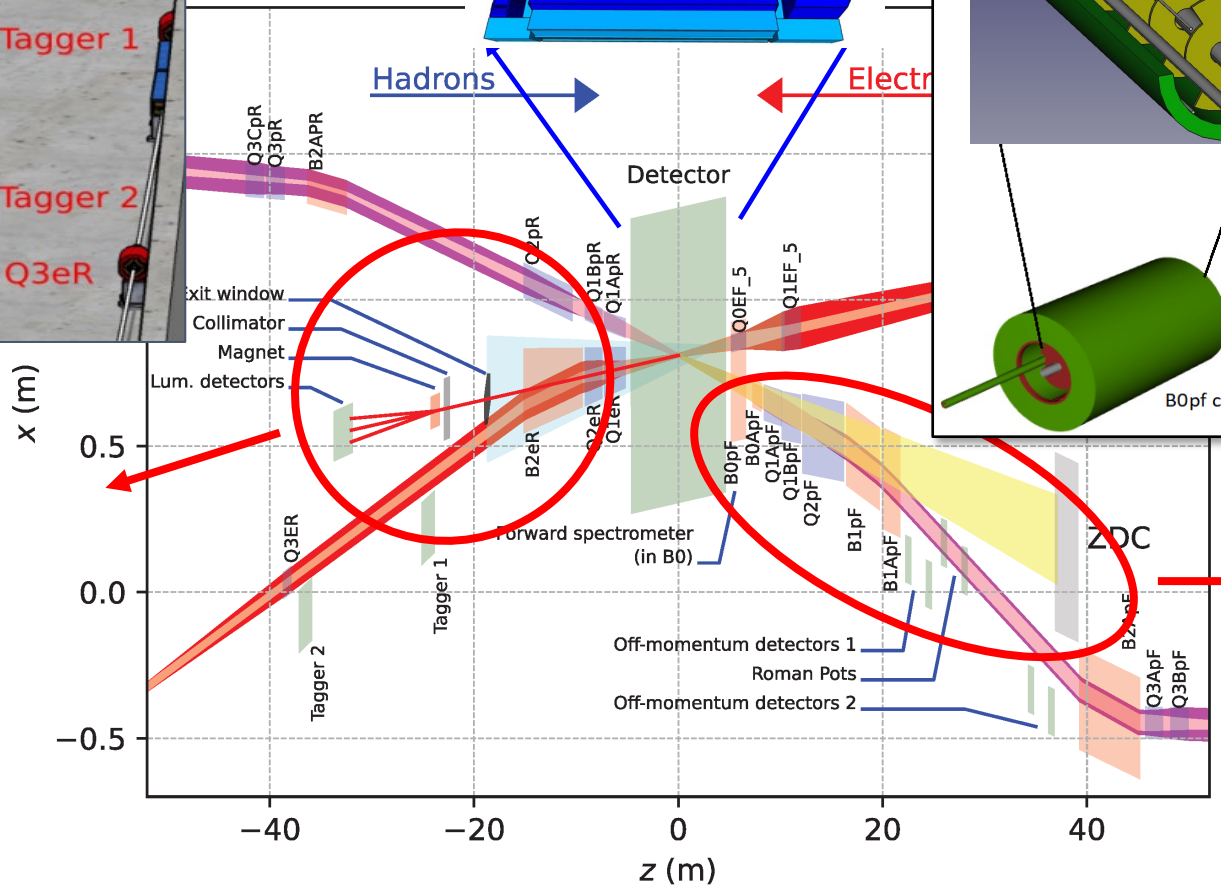
- Imaging Barrel EMCal
- PbWO4 EMCal in backward direction
- Finely segmented EMCal +HCal in forward direction
- Outer HCal (sPHENIX re-use)
- Backwards HCal (tail-catcher)

Far-Forward and Far-Backward Detectors









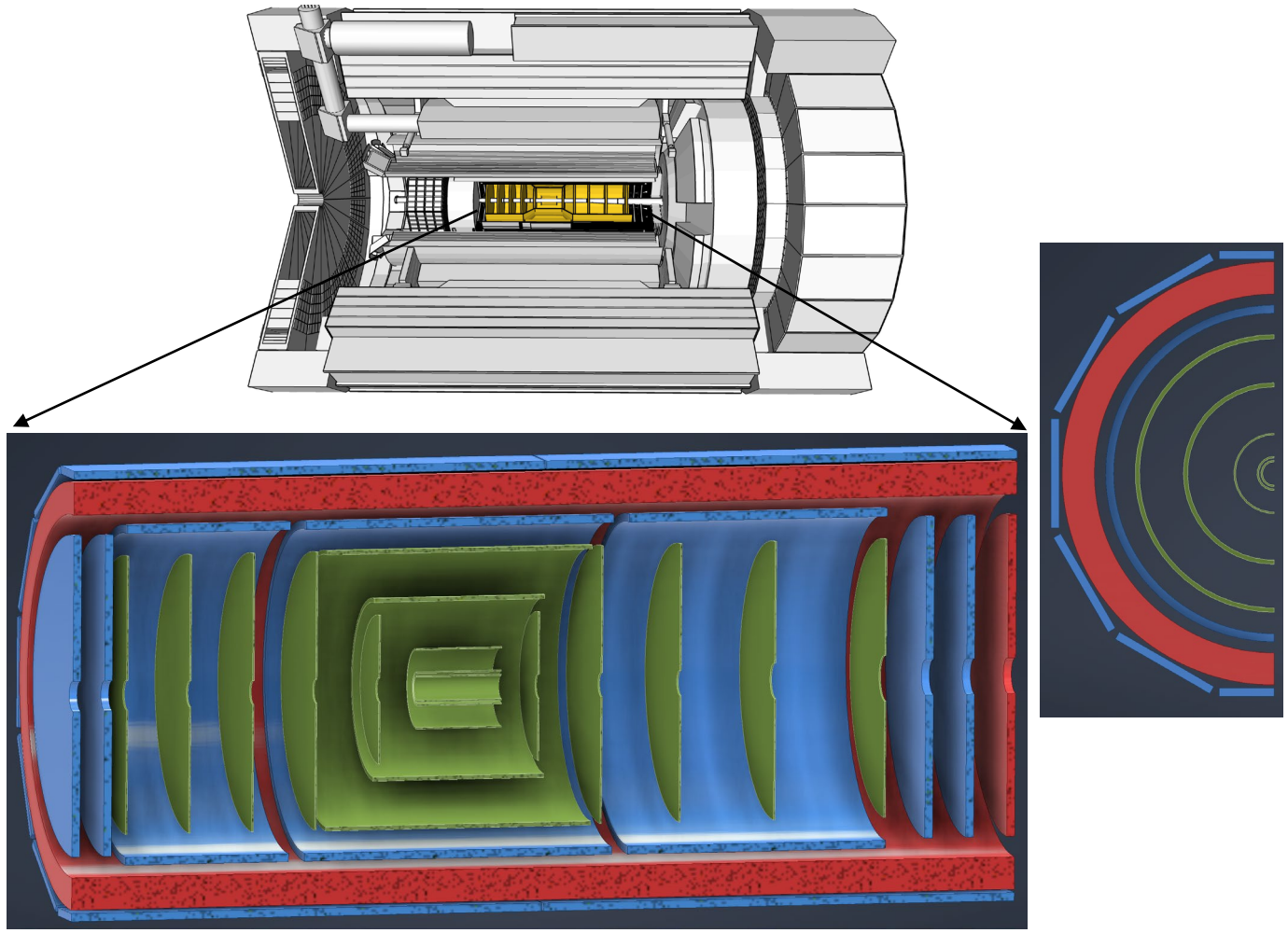
Far-Backward Detectors

- Luminosity monitor
- Low-Q^2 Tagging Detectors

Far-Forward Detectors

- B0 Tracking and Photon Detection
- Roman Pots and Off-Momentum Detectors
- Zero-Degree Calorimeter

ePIC Tracking Detectors



MAPS Barrel + Disks
MPGD Barrels + Disks
AC-LGAD based ToF

- **MAPS Tracker:**
  - Small pixels (20 μm), low power consumption (<20 mW/cm^2) and material budget (0.05% to 0.55% X/X$_0$) per layer
  - Based on ALICE ITS3 development
  - Vertex layers optimized for beam pipe bakeout and ITS-3 sensor size
  - Barrel layers based on EIC LAS development
  - Forward and backwards disks

world's first at ePIC

- **MPGD Layers:**
  - Provide timing and pattern recognition redundancy
  - Cylindrical μMEGAs
  - Planar μRWell's before hpDIRC
    - Impact point and direction for ring seeding

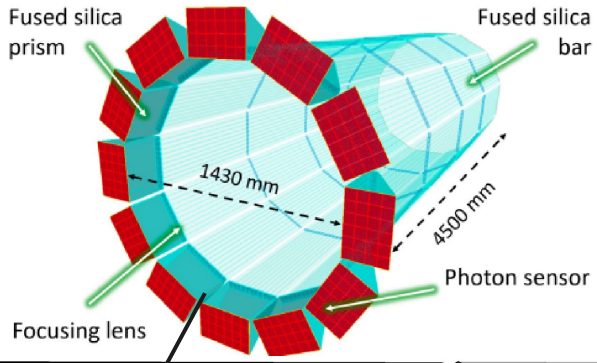
world's first at ePIC

- **AC-LGAD TOF and AstroPix (BECAL)**
  - Additional space point for pattern recognition / redundancy

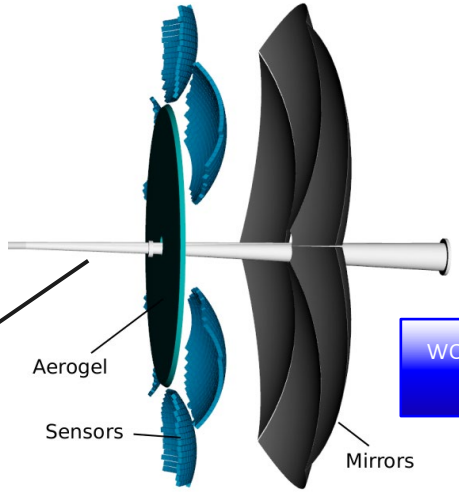
Particle ID

High-Performance DIRC

- Quartz bar radiator (BaBAR bars)
- light detection with MCP-PMTs
- Fully focused
- π/K 3σ separation at 6 GeV/c



Dual-Radiator RICH(dRICH)

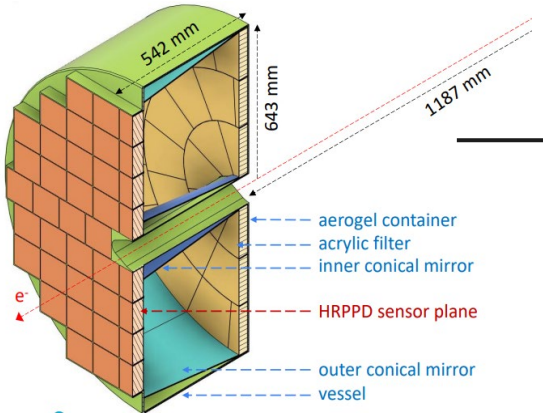


world's first at ePIC

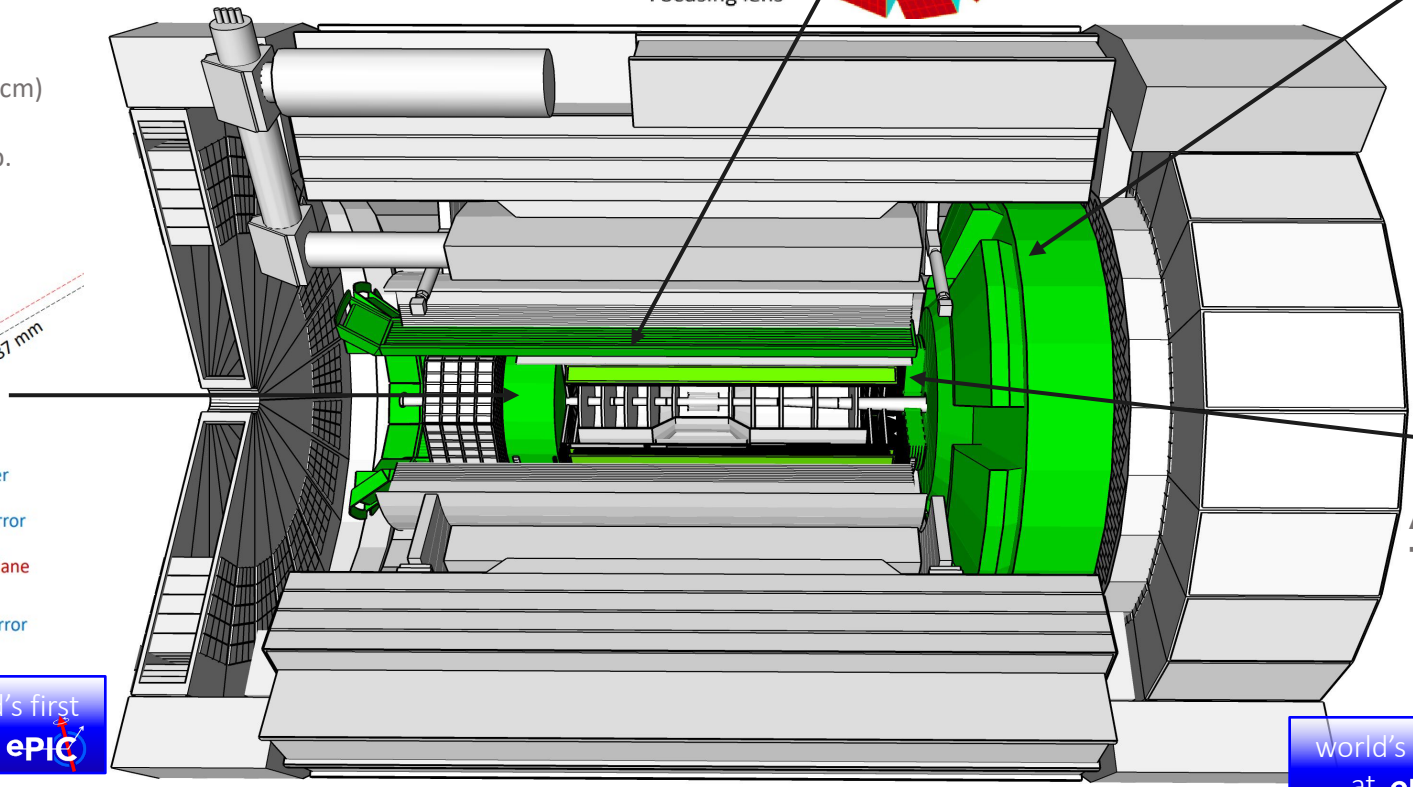
- C_2F_6 Gas Volume and Aerogel
- Sensors tiled on spheres (SiPMs)
- π/K 3σ sep. at 50 GeV/c

Proximity Focused (pfRICH)

- Long proximity gap (~40 cm)
- Sensor: HRPPDs
- up to 9 GeV/c 3σ π/K sep.



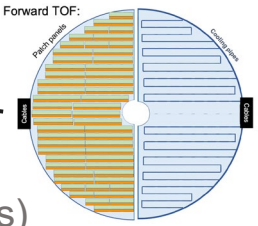
world's first at ePIC



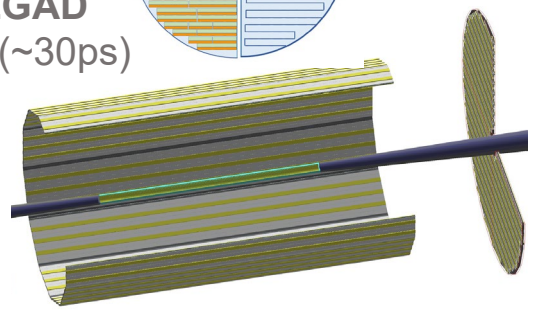
hadrons

electrons

world's first at ePIC

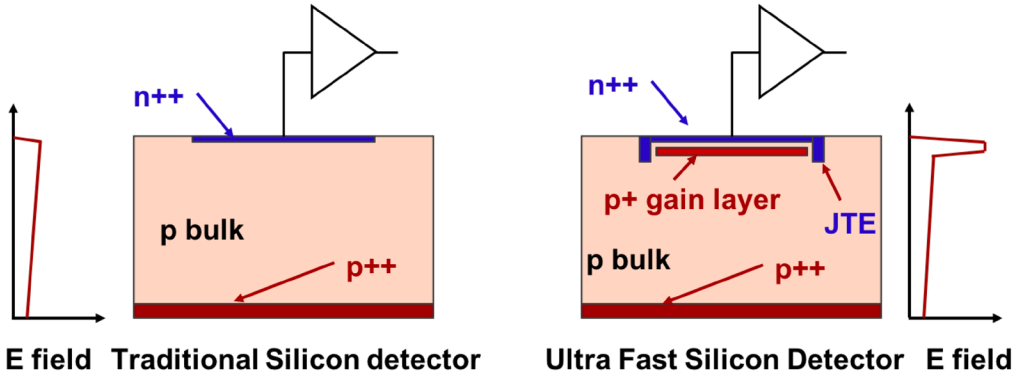


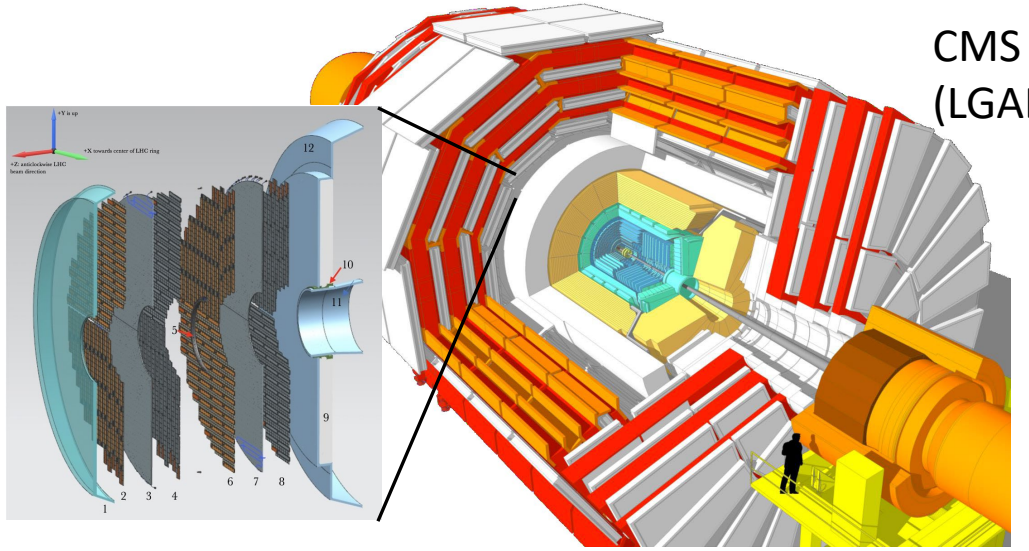
AC-LGAD TOF (~30ps)



- Accurate space point for tracking
- forward disk and central barrel

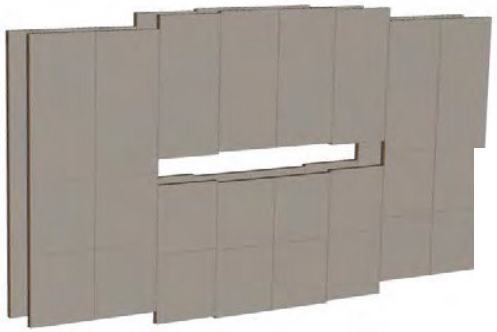
AC-LGAD TOF



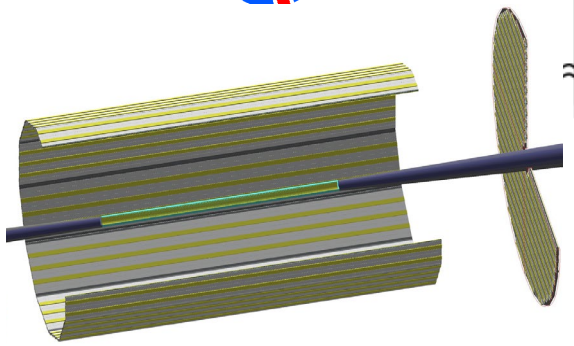


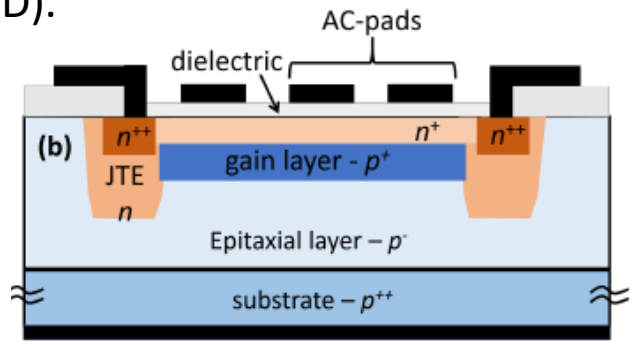
CMS ETL (LGAD)

AC-LGAD detectors add an AC-coupled readout to provide both *fast timing response* and *excellent spatial resolution* (4D).

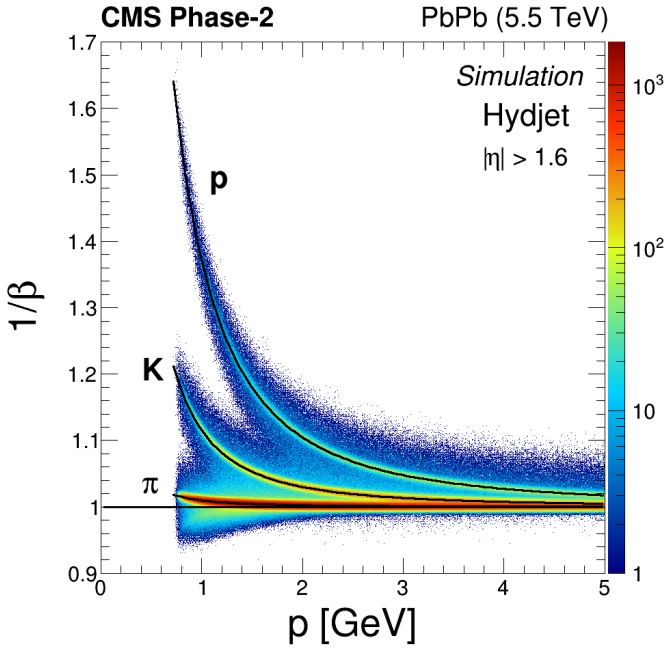


Roman pot arrays





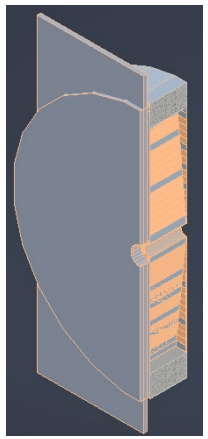
See following talk by Satoshi Yano



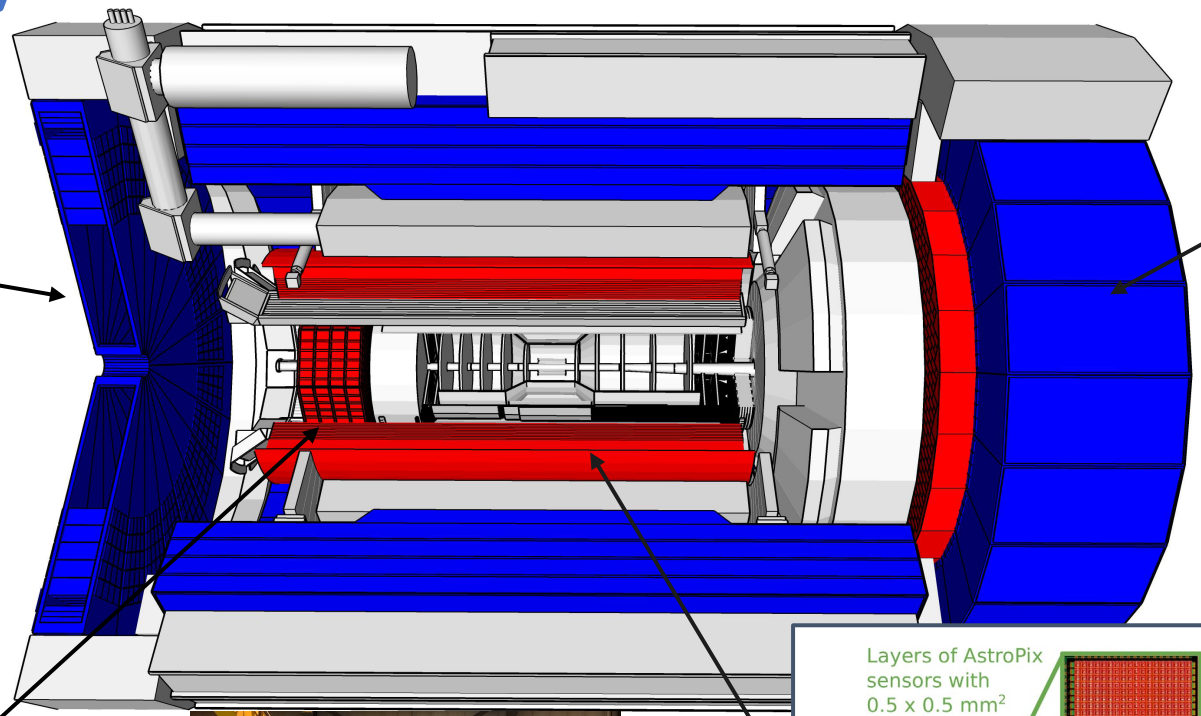
Calorimetry

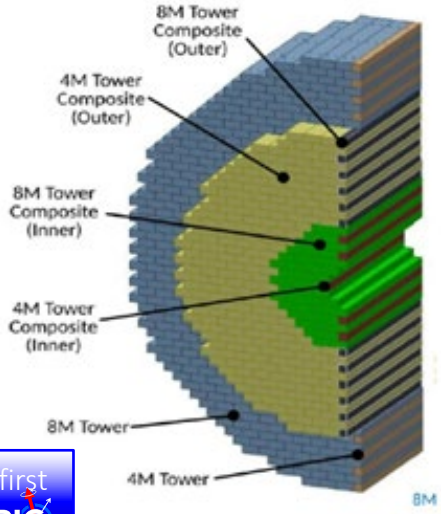
hadrons

electrons



Backwards HCal Steel/Sc Sandwich tail catcher

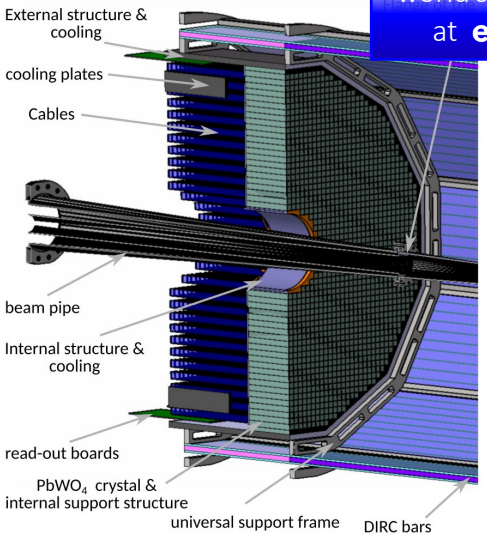




world's first at ePIC

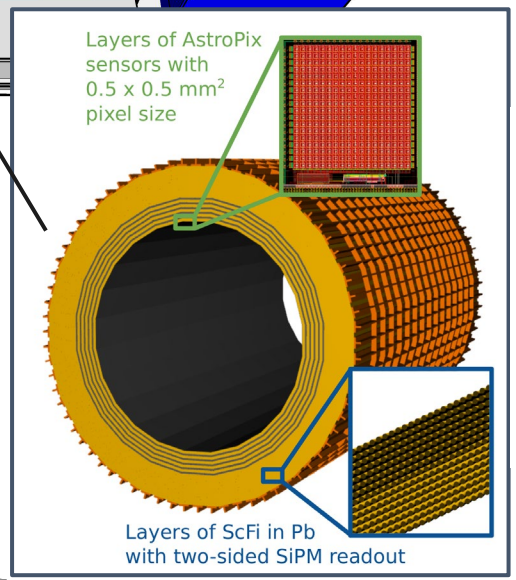
High granularity W/SciFi EMCal Longitudinally separated HCAL with high-η insert

world's first at ePIC



Backwards EMCal PbW04 crystals, SiPM photosensor

Barrel HCAL (sPHENIX re-use)

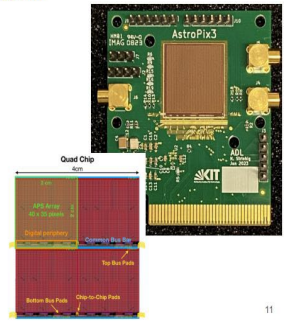


AstroPix v3: Design and Fabrication

Pixel Matrix:

- 500um² Pixel Pitch, 300um² Pixel Size
- 35 x 35 pixels
- first 3 cols PMOS amplifier others NMOS
- Pixel Comparator Outputs Row/ Column OR wired
- Goal:
  - Pixel Dynamic Range 20keV - 700keV
  - Noise Floor 5 keV (2%@662keV)

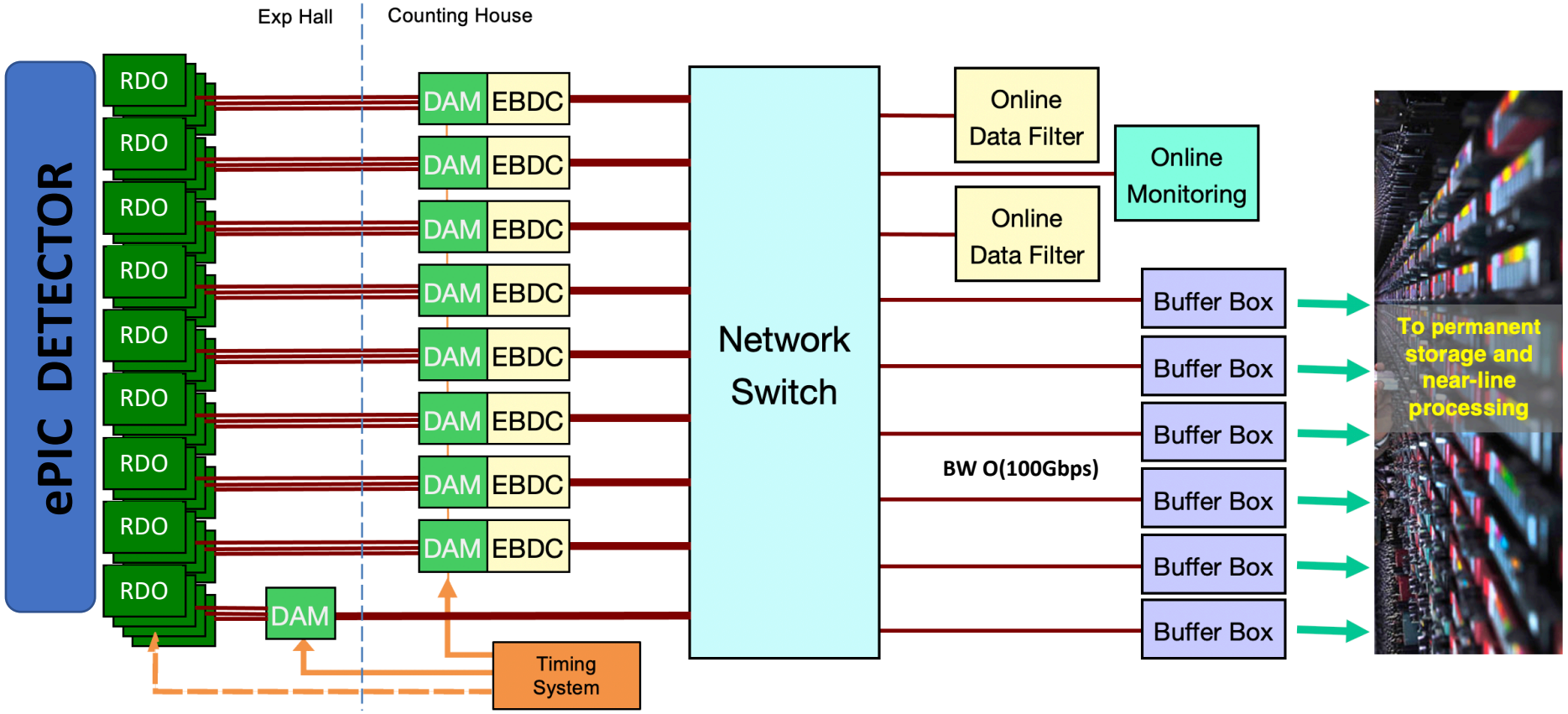
ASTROPIX



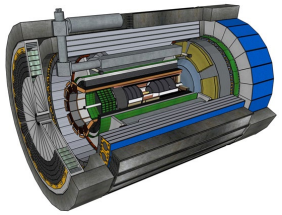
world's first at ePIC

ePIC Streaming DAQ

Bunch Crossing ~ 10.2 ns/98.5 MHz
Interaction Rate ~ 2 μs/500 kHz
Low occupancy

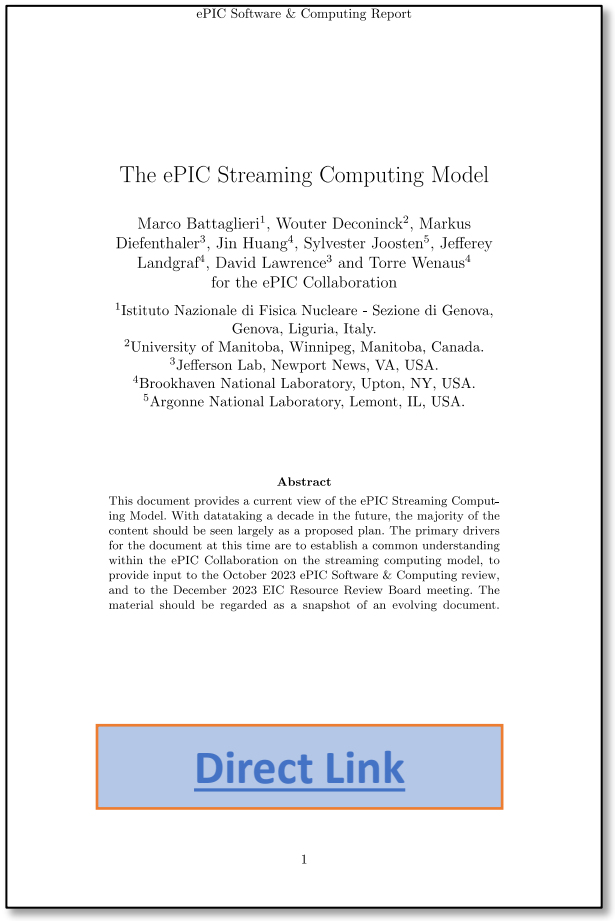


GTU/Distributed clock
(jitter ~5ps)



- No External trigger
- All collision data digitized but aggressively zero suppressed at FEB
- Low / zero deadtime
- Event selection can be based upon full data from all detectors (in real time, or later)
- Collision data flow is independent and unidirectional-> no global latency requirements
- Avoiding hardware trigger avoids complex custom hardware and firmware
- Data volume is reduced as much as possible at each stage ensuring that biases are controlled

Streaming Computing Model WG



ePIC Software & Computing Report

The ePIC Streaming Computing Model

Marco Battaglieri[1], Wouter Deconinck[2], Markus Diefenthaler[3], Jin Huang[4], Sylvester Joosten[5], Jefferey Landgraf[4], David Lawrence[3] and Torre Wenaus[4]
for the ePIC Collaboration

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[2]University of Manitoba, Winnipeg, Manitoba, Canada.
[3]Jefferson Lab, Newport News, VA, USA.
[4]Brookhaven National Laboratory, Upton, NY, USA.
[5]Argonne National Laboratory, Lemont, IL, USA.

Abstract

This document provides a current view of the ePIC Streaming Computing Model. With datataking a decade in the future, the majority of the content should be seen largely as a proposed plan. The primary drivers for the document at this time are to establish a common understanding within the ePIC Collaboration on the streaming computing model, to provide input to the October 2023 ePIC Software & Computing review, and to the December 2023 EIC Resource Review Board meeting. The material should be regarded as a snapshot of an evolving document.

Direct Link

1

- Defined requirements and high-level design for a **computing model** that enables **rapid data processing for physics analyses.**
- **Compute-detector integration** using:

Streaming readout for continuous data flow of the full detector information.	**AI** for autonomous alignment and calibration as well as reconstruction and validation.	**Heterogeneous computing** for acceleration.

- Started documenting a streaming computing model that can be redefined further with international partners.
- Initial version of the ePIC Streaming Computing Model has been presented in recent ePIC Software & Computing Review.

Realizing the ePIC Streaming Computing Model

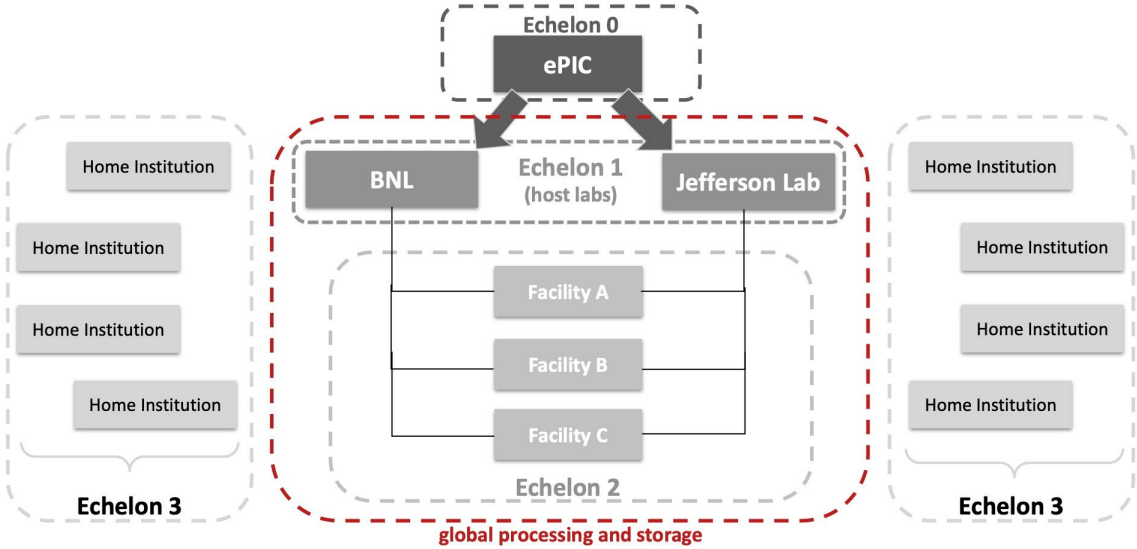
Four Tiers:

Echelon 0: ePIC Experiment

Echelon 1: Crucial and innovative partnership between host labs.

Echelon 2: Global processing and data facilities, includes High-Performance (HPC) and High-Throughput Computing (HTC) resources.

Echelon 3: Full support of the analysis community at the home institutions.



Next Steps:

- Provide for each use case detailed **estimates on the compute resources**; obtain an idea of how resources are provided by host labs (Echelon 1) and international partners (Echelon 2).
- Alternately, detail the needs **to fully support** future EIC science data taking and analysis in this model. Requires coordination with the BNL+JLab EIC Computing & Software Joint Institute, as well as R&D in collaboration with theory as well as computer and data scientists.
- **Advance distributed computing capabilities** and start **integrating resources from international partners.**
    - Will start integrating resources from international partners on the Open Science Grid (OSG).
- Design the system for both batch and **dynamic processing** to ensure resilience against technology evolution.
- **Streaming challenges** exercising the streaming workflows from DAQ through offline reconstruction.
- Analysis challenges exercising **autonomous alignment** and **calibrations**.

Echelon 2: Global ePIC Computing

ePIC is an international collaboration and so is its computing:

- **Echelon 2** includes **global resources contributed by collaborating institutions**.
- Achieving scientific goals relies on effectively using Echelon 2's resources.
- Design of computing model aims for **effective integration and management**.
- **EIC Computing & Software Joint Institute (ECSJI)** by host labs oversees complex computing fabric of the EIC.

International computing contributions are essential.

International Contributions:

- **From the review close out**:

  "There are clearly very significant opportunities in in-kind computing infrastructure contributions."

- Canada, Italy, and the United Kingdom are engaged as a proof of concept in this context.
  - Integration of resources from international partners into Open Science Grid foreseen on timescale of TDR.
- Computing centers of these countries were already included in large-scale simulation efforts for the EIC.

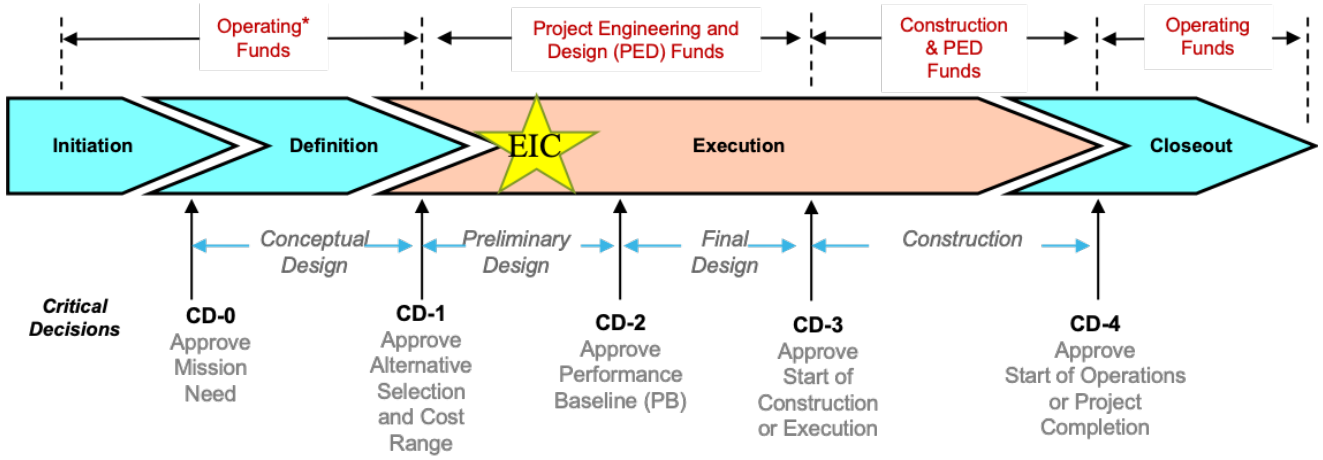
What to look forward to in 2024…

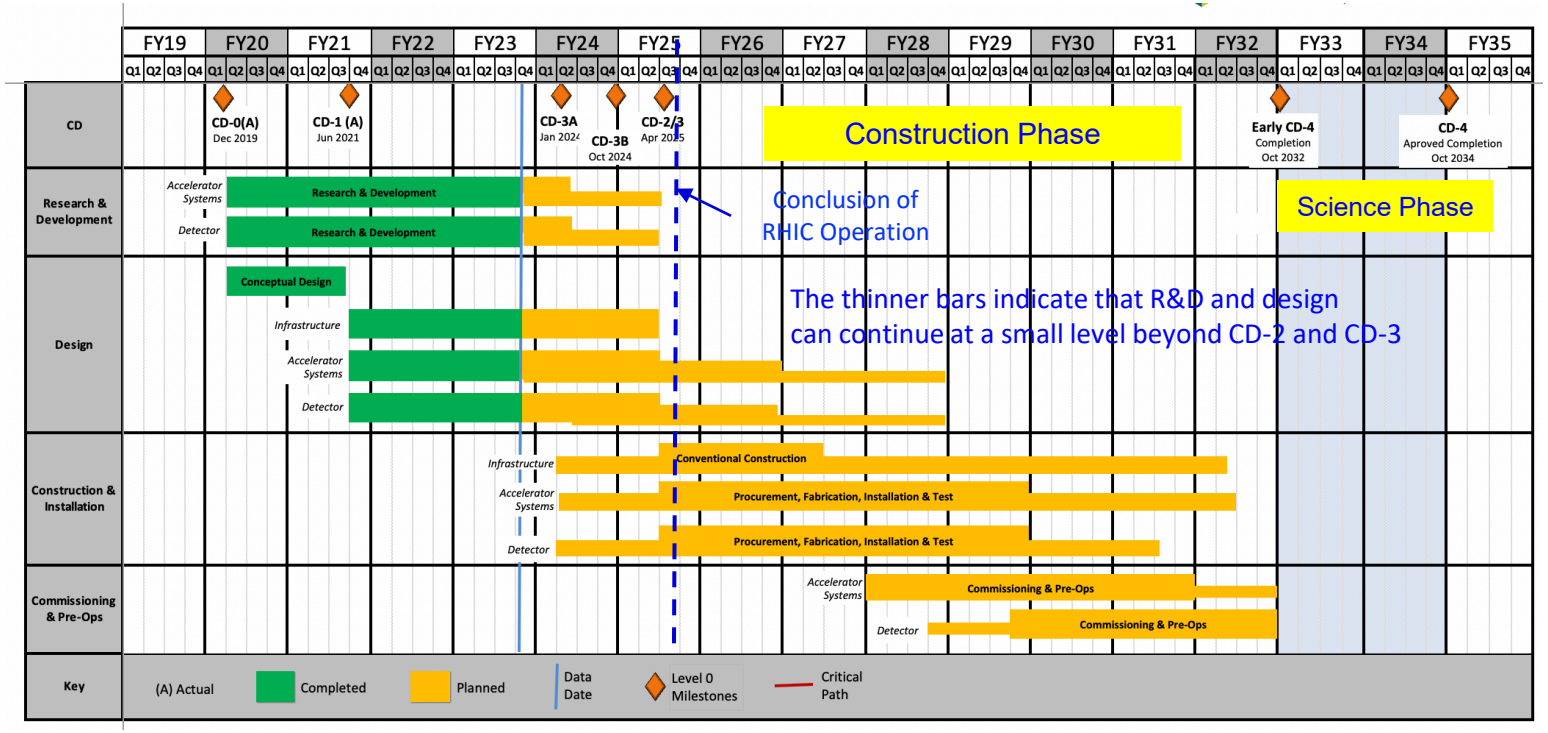
EIC Schedule

EIC Critical Decision Plan	
CD-0/Site Selection	December 2019 ✓
CD-1	June 2021 ✓
CD-3A	January 2024
CD-3B	**October 2024**
CD-2/3	**April 2025**
early CD-4	October 2032
CD-4	**October 2034**

CD-2:
Approve preliminary design for all subdetectors
Design Maturity: >60%
Need “pre-”TDR
Baseline project in scope, cost, schedule

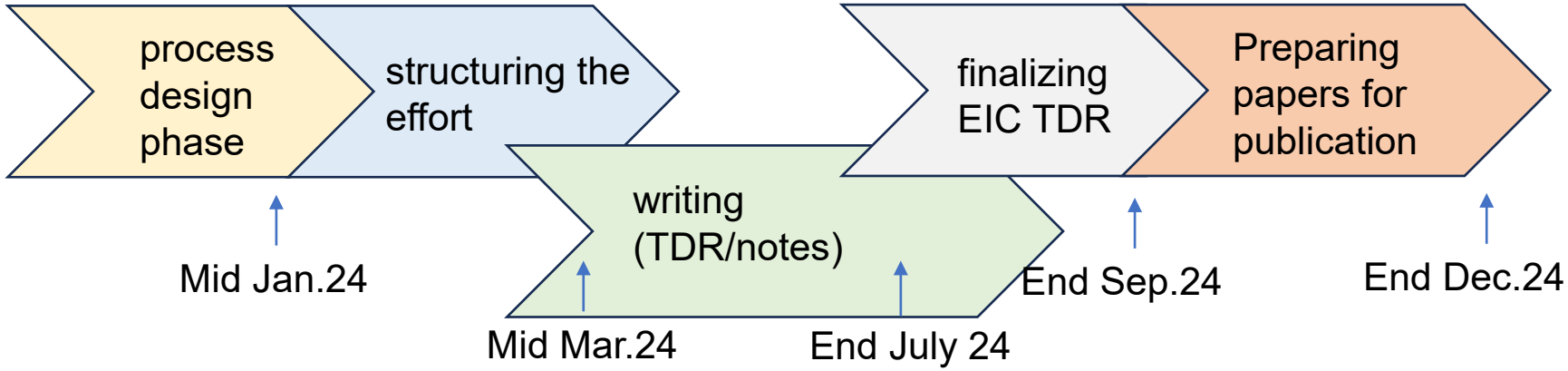
CD-3:
Approve final design for all subdetectors
Design Maturity: ~90%
Need full TDR





TDR Strategy and Publications

- In 2024 the ePIC collaboration will produce:
- The ePIC contributions to the EIC TDR
  - The EIC TDR is the top priority
    - Chapters on *Physics Goals and Requirements* and *Experimental Systems*
    - Not just the document, but the simulations and detector R&D that form the basis
    - Requires close cooperation between the collaboration and the project!
- An ePIC Detector Design paper:
    - Derived and expanded from the *Experimental Systems* TDR chapter
- An ePIC Physics Performance paper:
    - Derived and expanded from the *Physics Goals and Requirements* TDR chapter
- Both to be published in a scientific journal (such as NIMA, JINST, or PRC, etc.)
- These publications will serve as a focus in developing the ePIC Membership and Publication policies.



ePIC TDR Planning Meetings

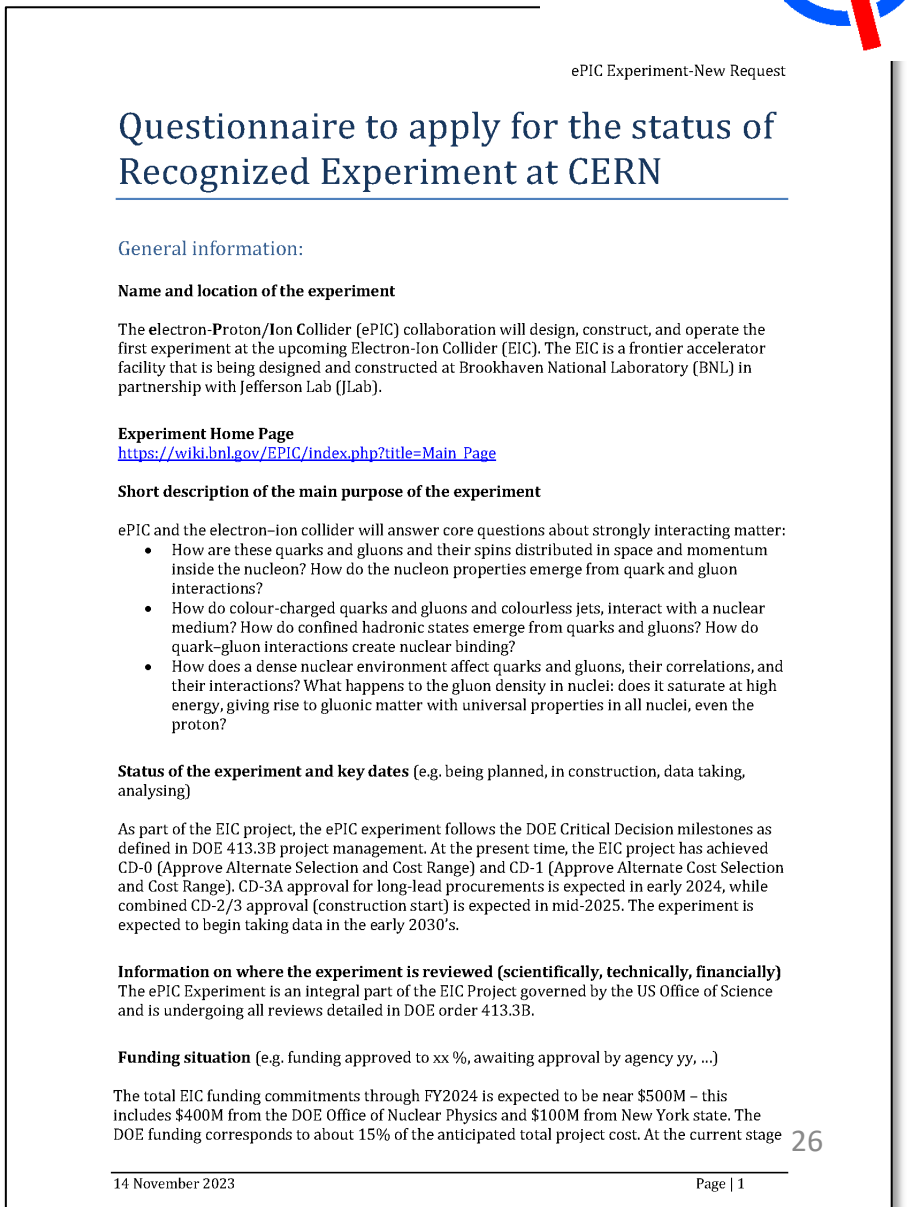
- Work has already started in the DSC's, the TIC and SC
  - DSC's and CC WG's asked for plans and timelines
- ePIC Analysis Coordination Meeting Jan. 26th (today)
  - https://indico.bnl.gov/event/21725/
  - Status of analysis efforts in ePIC and discussion
- Analysis TDR Kick-Off Meeting Feb.5th
  - https://indico.bnl.gov/event/21775/
  - Physics WG needs, coordination and planning
- ePIC Software, Computing and Physics Discussion
  - https://indico.bnl.gov/event/21772/
- TIC Meeting Feb. 19th
  - https://indico.bnl.gov/event/21932/
  - Planning for the TDR effort
- Weekly Software and Computing Meetings:
  - Wednesdays @ 11AM ET
  - https://indico.bnl.gov/category/435/

- Regularly scheduled General Meetings: Next: Fri, Feb 2nd 2024 @ 10:30AM ET

CERN Recognized Experiment

- ePIC Application for CERN Recognized Experiment:
  - ePIC leadership has submitted an application to become a CERN Recognized Experiment
  - Strong synergies between CERN and EIC
  - Important for access to CERN resources (test beams, …)
  - Increase visibility in the European community

- ePIC presentation scheduled for Thursday, Feb 8th at 1:15M @ CERN



ePIC Experiment-New Request

Questionnaire to apply for the status of Recognized Experiment at CERN

General information:

Name and location of the experiment

The **e**lectron-**P**roton/**I**on **C**ollider (ePIC) collaboration will design, construct, and operate the first experiment at the upcoming Electron-Ion Collider (EIC). The EIC is a frontier accelerator facility that is being designed and constructed at Brookhaven National Laboratory (BNL) in partnership with Jefferson Lab (JLab).

Experiment Home Page
https://wiki.bnl.gov/EPIC/index.php?title=Main_Page

Short description of the main purpose of the experiment

ePIC and the electron–ion collider will answer core questions about strongly interacting matter:

- How are these quarks and gluons and their spins distributed in space and momentum inside the nucleon? How do the nucleon properties emerge from quark and gluon interactions?
- How do colour-charged quarks and gluons and colourless jets, interact with a nuclear medium? How do confined hadronic states emerge from quarks and gluons? How do quark–gluon interactions create nuclear binding?
- How does a dense nuclear environment affect quarks and gluons, their correlations, and their interactions? What happens to the gluon density in nuclei: does it saturate at high energy, giving rise to gluonic matter with universal properties in all nuclei, even the proton?

Status of the experiment and key dates (e.g. being planned, in construction, data taking, analysing)

As part of the EIC project, the ePIC experiment follows the DOE Critical Decision milestones as defined in DOE 413.3B project management. At the present time, the EIC project has achieved CD-0 (Approve Alternate Selection and Cost Range) and CD-1 (Approve Alternate Cost Selection and Cost Range). CD-3A approval for long-lead procurements is expected in early 2024, while combined CD-2/3 approval (construction start) is expected in mid-2025. The experiment is expected to begin taking data in the early 2030's.

Information on where the experiment is reviewed (scientifically, technically, financially)
The ePIC Experiment is an integral part of the EIC Project governed by the US Office of Science and is undergoing all reviews detailed in DOE order 413.3B.

Funding situation (e.g. funding approved to xx %, awaiting approval by agency yy, …)

The total EIC funding commitments through FY2024 is expected to be near $500M – this includes $400M from the DOE Office of Nuclear Physics and $100M from New York state. The DOE funding corresponds to about 15% of the anticipated total project cost. At the current stage

14 November 2023 Page | 1

Upcoming Events…

- 3rd EIC-Asia Workshop in Taiwan Jan. 29-31, 2024
  - https://indico.phys.sinica.edu.tw/event/88/
- CERN Recognized Experiment - Feb 8th , 2024
- FFWD/FBKWD Preliminary Design Review
  - February 12, 2024
- DIS 2024 in Grenoble, France April 8-12th , 2024
  - https://lpsc-indico.in2p3.fr/event/3268/
- ePIC Software and Computing meeting @ CERN April 22nd-26th
  - https://indico.cern.ch/event/1343984/
- 4th EIC-Asia Workshop in Shanghai July 1-5, 2024
  - https://indico.cern.ch/event/1361239/
- Joint EICUG/ePIC Collaboration Meeting @ Lehigh University July 22nd-28th
  - https://indico.bnl.gov/event/20727/

Take-Away Messages

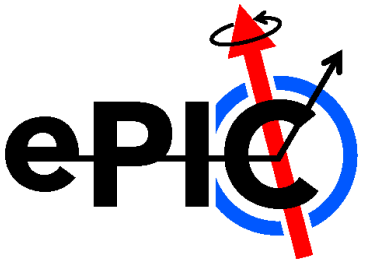
- The ePIC Collaboration is strong, active and growing!
  - New member institutions bring new strengths
  - International participation is key to the success of ePIC!
    - International collaborators play key roles in collaboration leadership
  - Collaboration committees are formed and working

- The ePIC detector is maturing into a detailed technical design tuned to pursue the EIC science program

- Extensive planning underway for a coordinated effort to evolve the ePIC technical design and document it in a TDR and publications


BACK UP

ePIC Resources



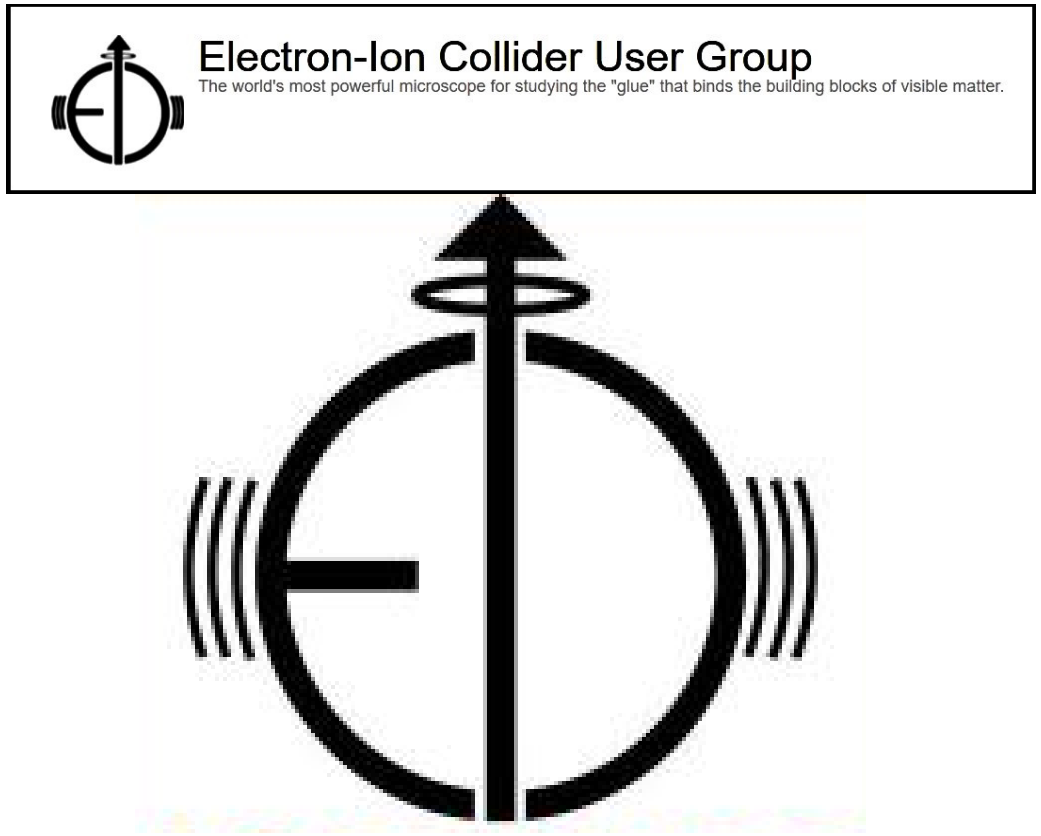
- Mailing Lists – https://lists.bnl.gov/mailman/listinfo
- Indico Agenda - https://indico.bnl.gov/category/402/
  - ePIC Software and Computing: https://indico.bnl.gov/category/435/
- Wiki - https://wiki.bnl.gov/EPIC
- ePIC Software Training:
  - Landing Page: https://eic.github.io/documentation/landingpage.html
  - Tutorials: https://eic.github.io/documentation/tutorials.html
- Mattermost: https://chat.epic-eic.org

EICUG Membership

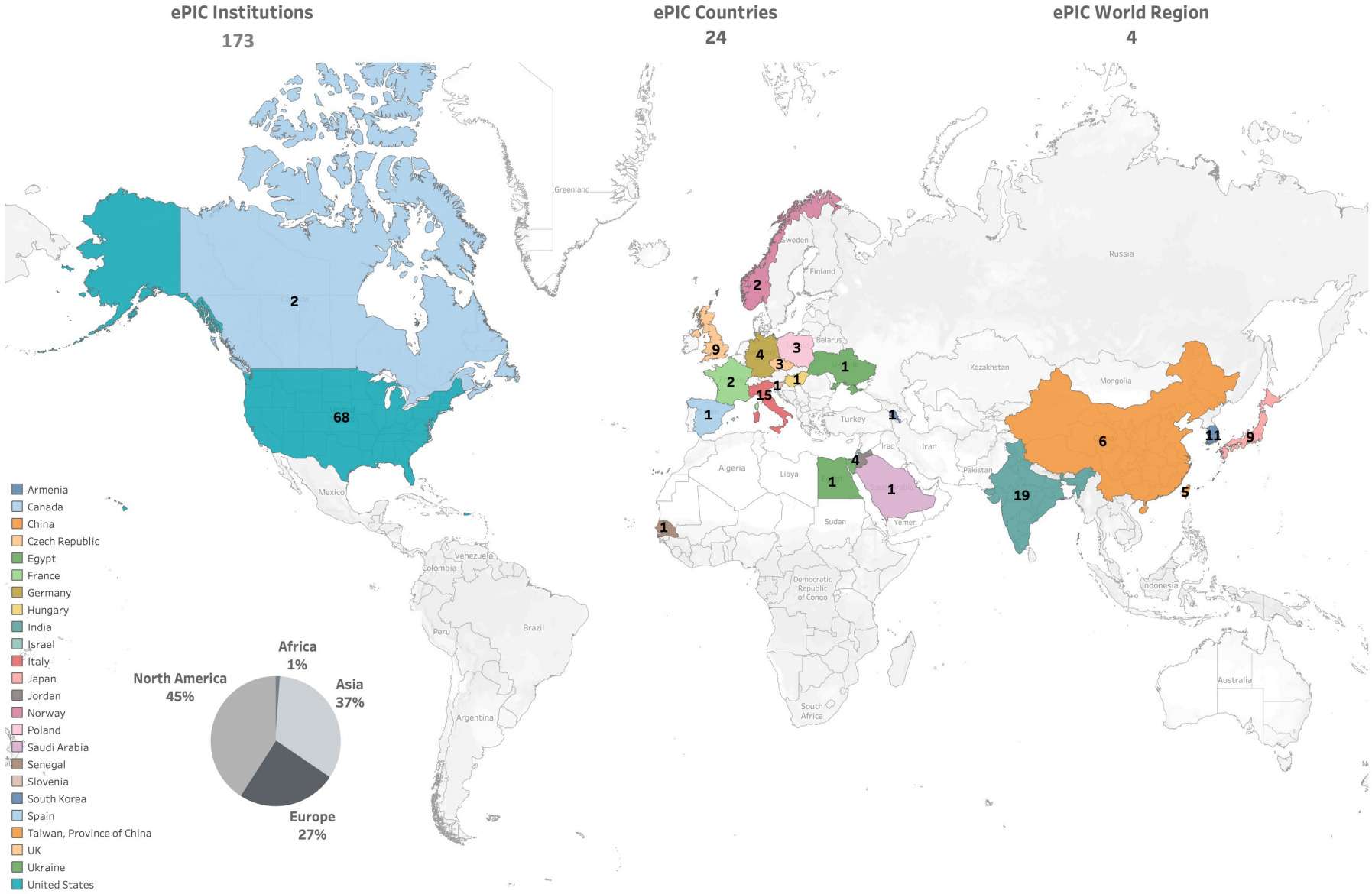
- The EICUG is a vital organization to promote the interests of the EIC community!
  - Without the EICUG we would never have gotten far enough to form ePIC!

- Please register your institution!
- Check with your EICUG IB representative to get registered as a member

- https://www.eicug.org/content/join.html



International



ePIC Collaboration Web Presence

Integrated into the main EIC website through the top navigation. Page contains contact information and link to the ePIC Wiki.

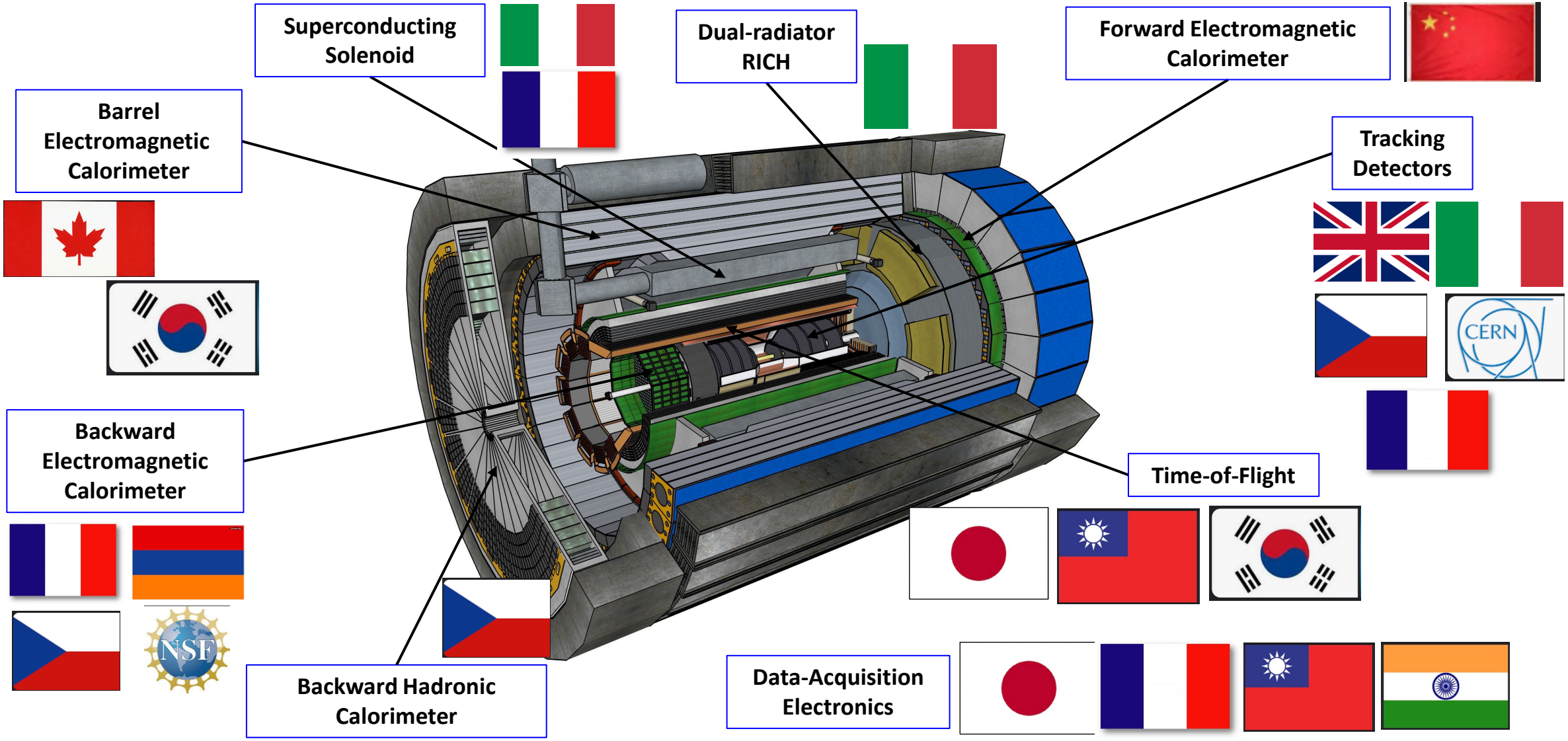
Gary Schroeder, Karen McNulty Walsch, Thomas Ullrich, JGL

Animations courtesy of UC Riverside group.

Continuing to update and improve.

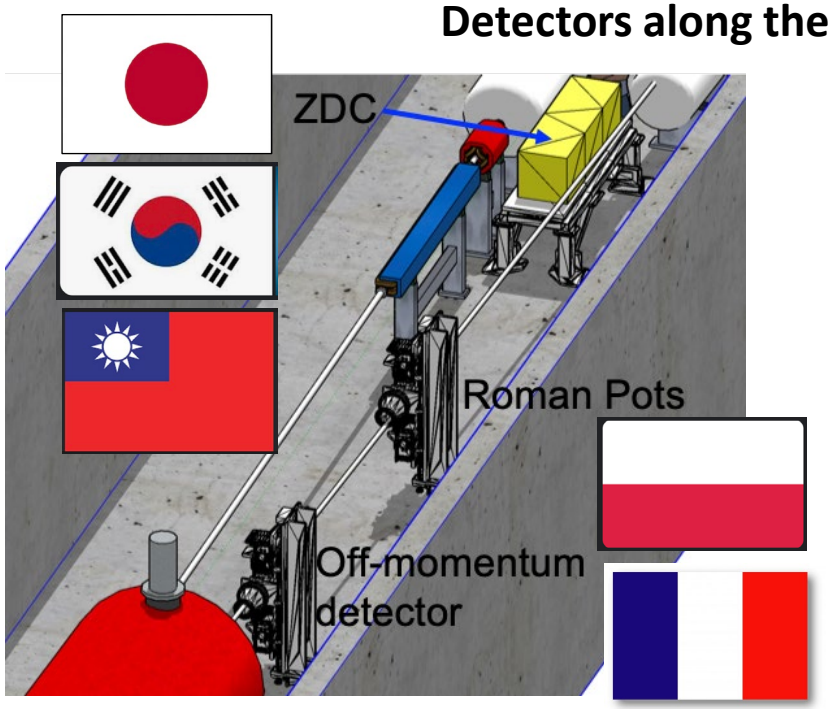
https://www.bnl.gov/eic/epic.php

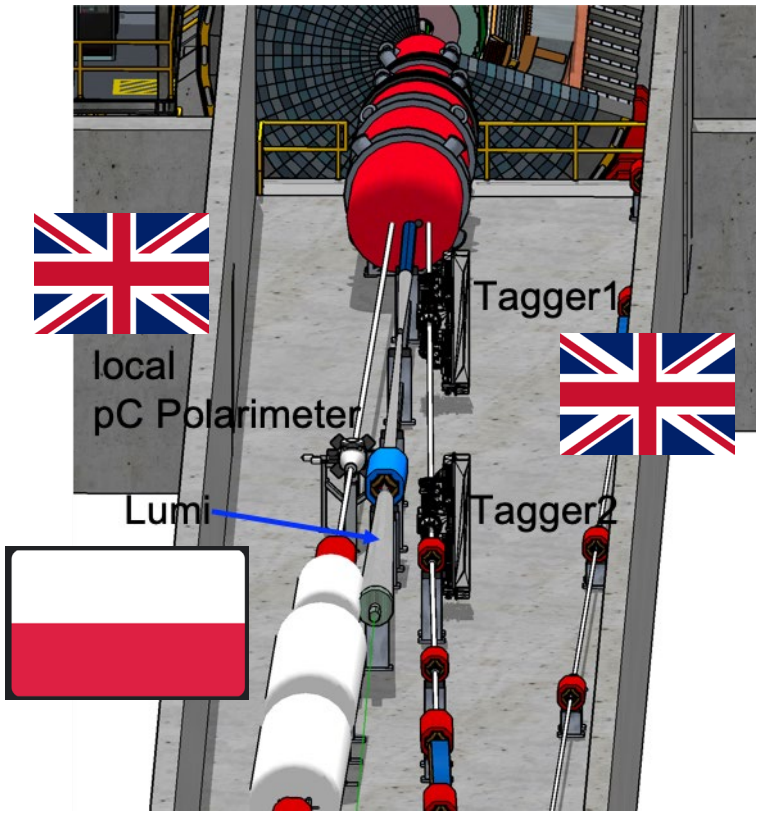
Central Detector Non-DOE Interest & In-Kind



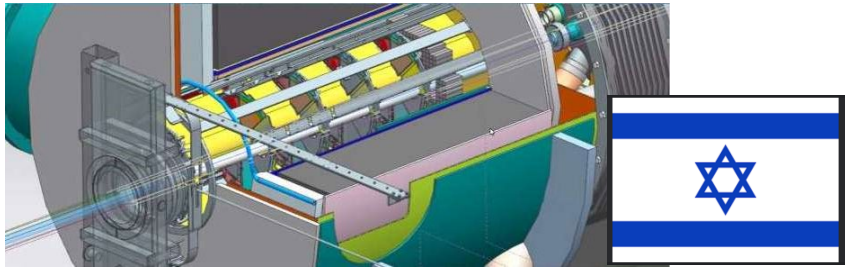
Far-Forward/Far-Backward Detectors Non-DOE Interest & In-Kind

Detectors along the hadron and electron beam-lines

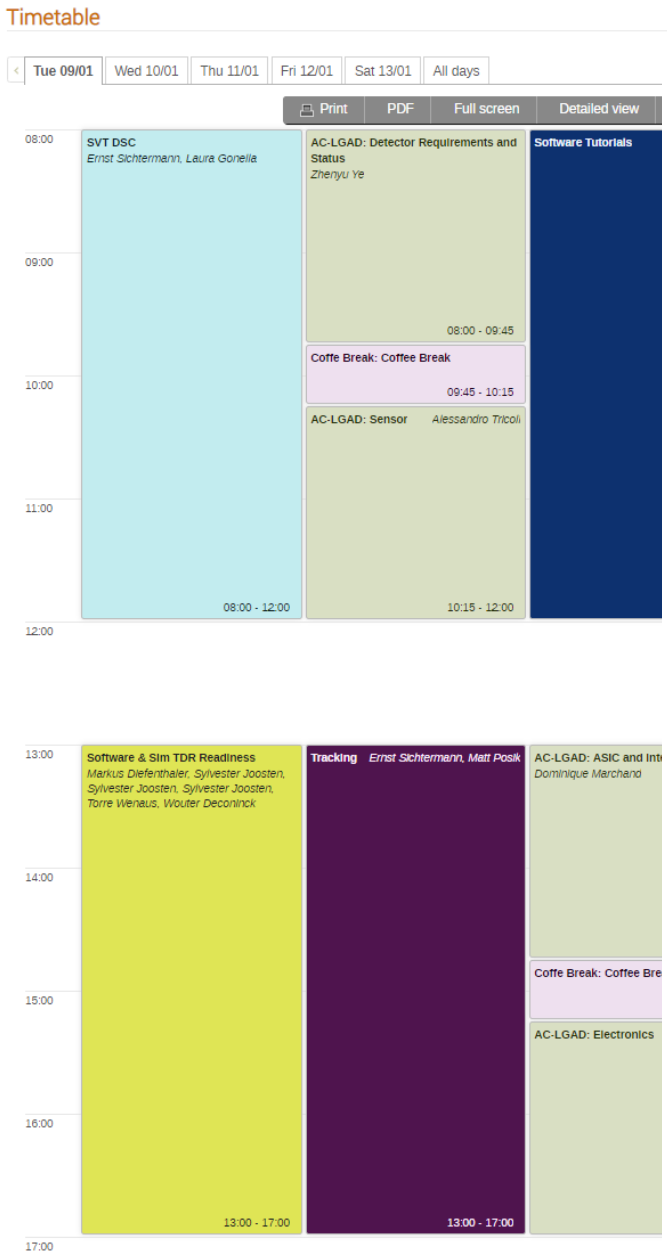


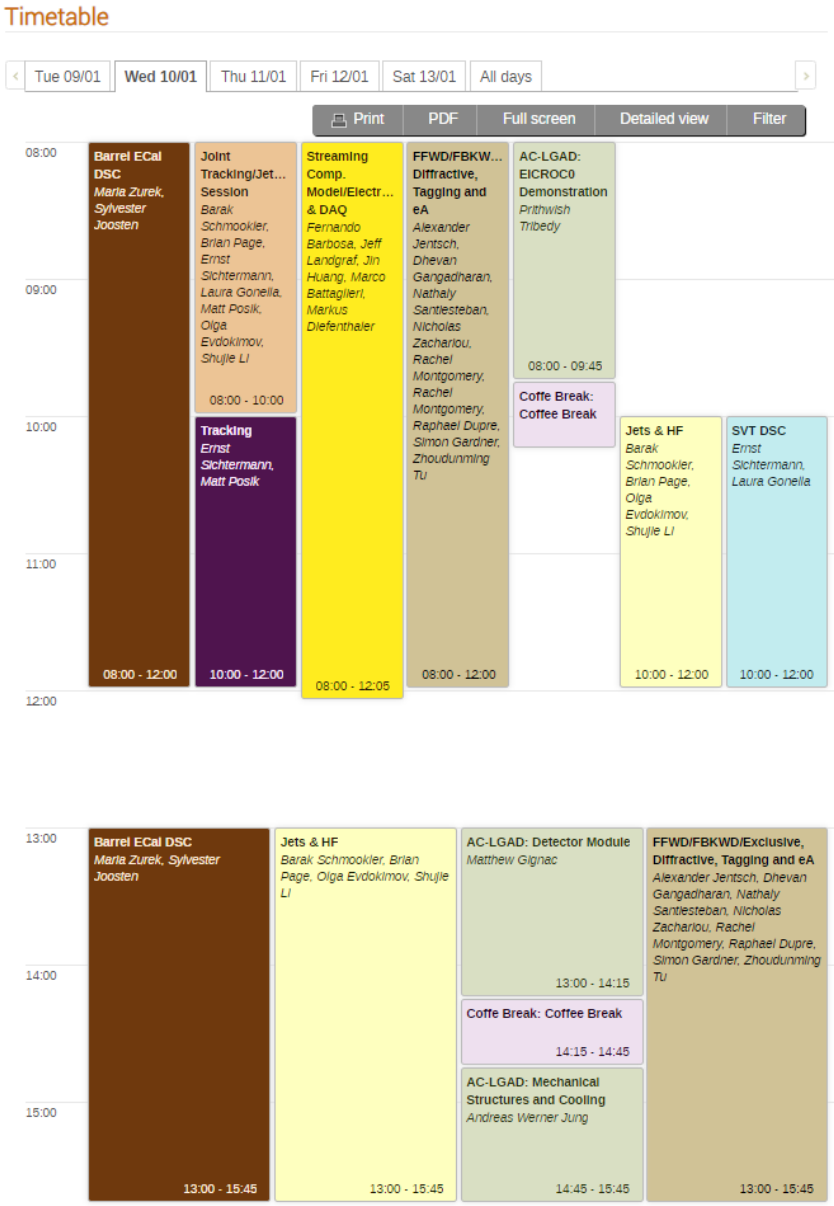


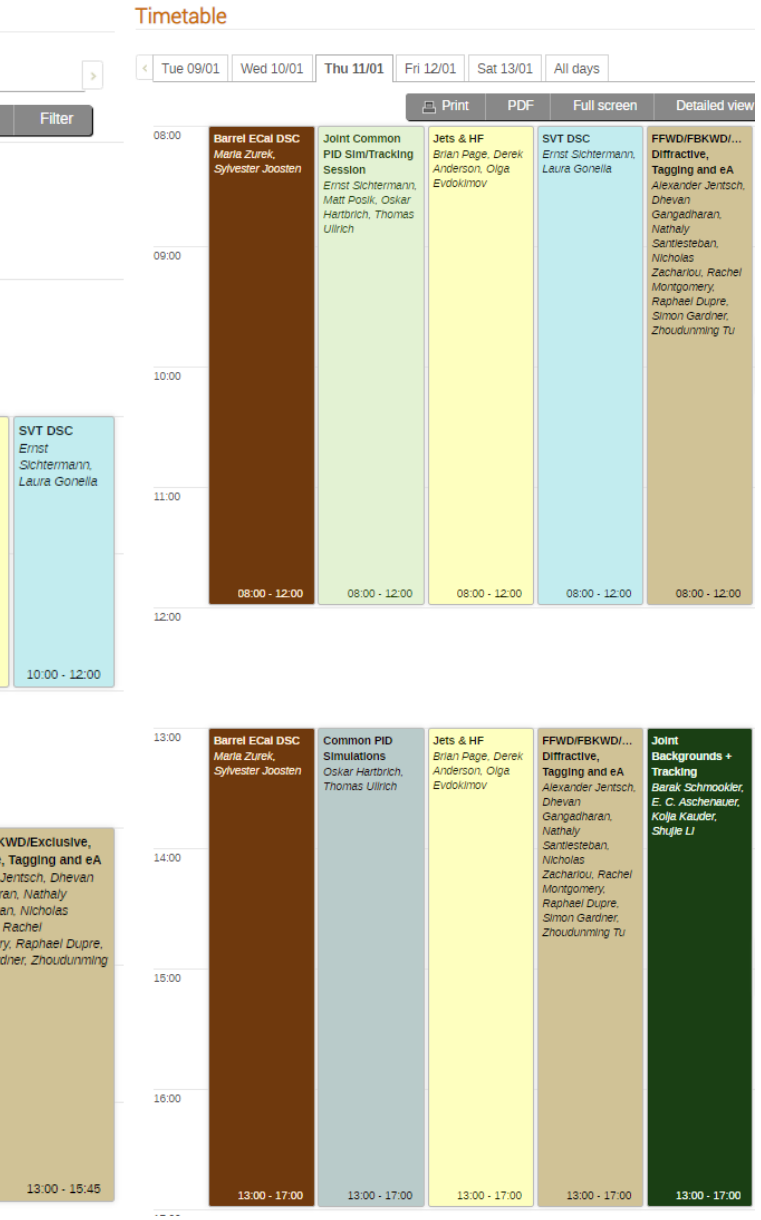
B0-Tracker & Electromagnetic Calorimeter



Jan 2024 ePIC Collaboration Meeting







Jan 2024 ePIC