

The ePIC Barrel Imaging Calorimeter

BIC News Collaboration Meeting

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BIC General Meeting
February 14, 2025



News Brief



See full agenda with attached presentations:

<https://agenda.infn.it/event/43344/timetable/#20250120>

Updated tentative project schedule with EIC Subprojects and Inferred BIC Schedule

Collaboration Meeting focused on setting up priorities for the next year 2025 including the Technical Coordination office (see the last day sessions)

Discussions with DAQ team on several aspects (see the notes), BIC-Korea Team on priorities for the beam test

EIC Project CD-2 Planning

CD-2 Project Planning Objectives and Constraints:

- Scope required for the DOE Project Key Performance Parameters (KPPs)
- Develop plans for the execution of the portfolio of “off-project” scope
- EIC Project total cost less than \$3B (working to optimize scope within this objective)
- DOE annual project funding not to exceed \$300M per year
- EIC construction start following the conclusion of RHIC operations
- Start Early Science Program when electron-ion collisions begin!

See Early Science Session including early EIC capabilities

The constraints result in a longer construction schedule and “dark period” than desirable. This can be partially mitigated by constructing EIC in two stages:

Early Science:	Electron-ion collisions with the ePIC detector
Mission Need:	Additional project scope required to meet the Mission Need

One integrated project delivery plan for the EIC aligned with annual funding constraints.

EIC and Subprojects

Science Program starts after Subproject 3 is complete.

Subproject 1 - Accelerator – HSR, ESR, INF

Subproject 2 - IR Integration, SC Magnets, Detector

Subproject 3 - Electron Injector, Infrastructure

Subproject 4 - Full EIC Capabilities

Detector:
Subproject 2

Tentative Schedule

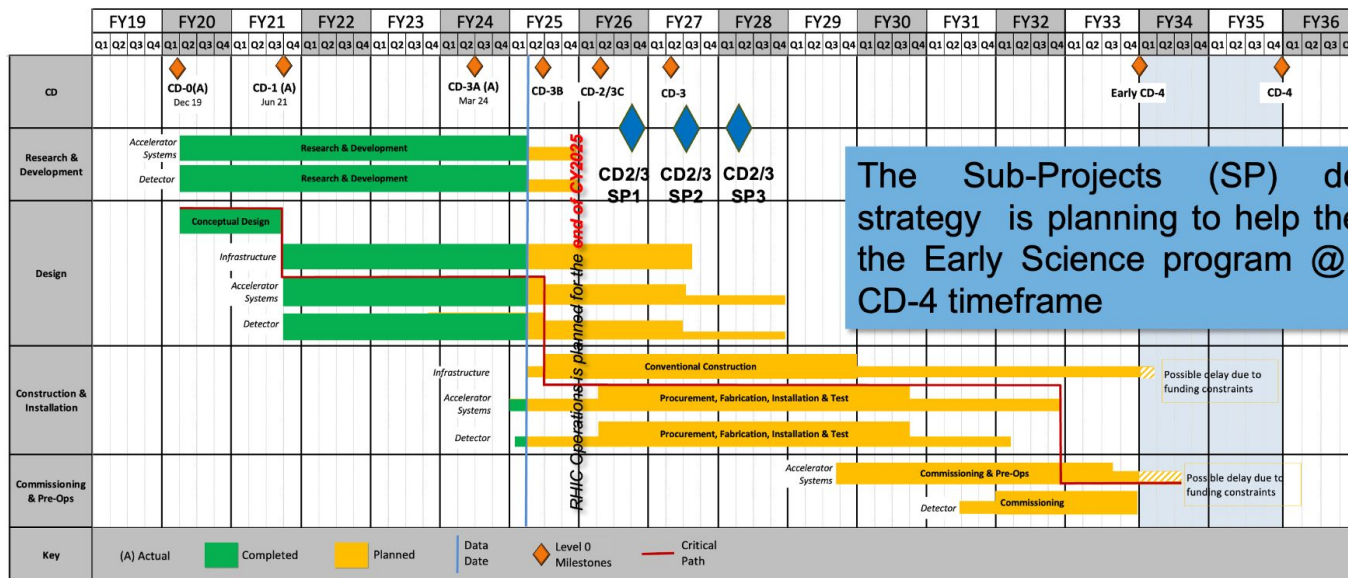
J. Lajoie, ePIC Collaboration Status



Schedule

From L. Lari CD-3B Plenary Presentation

Under finalization; Mostly Technically Driven after FY2027



Since CD-1, the critical path is on the Accelerator systems.

Electron-Ion Collider

EIC OPA CD-3B LLP Review, January 7-9, 2025

L. Lari

BIC Schedule



- **Preliminary Design Review - August 2025**

What's next?

Inferred BIC Schedule (Based on EIC Tentative Schedule)

- BIC Final Design Review around ~May 2026
- Start of production around ~October 2027 (6+ months after OPA approval)
- Current PED contracts run until November 2025
- PED and Pre-production will need to cover period between November 2025 and October 2027 (almost 2 years)
- BIC delivery to BNL by mid 2030, install complete by end 2030 (Q1 FY31)

Miscellaneous Items related to DAQ



DAQ Integration (conversation with Jeff Landgraff from DAQ group)

Reviewers keep wanting to see “**performance of integrated system**” but no funding for ETC yet, and no CALOROC (final version) board until ~2028 → have to clearly define realistic scope for future reviews with EIC Project

Comment from Norbert: first versions will be available already this year!

Expectations on ETC from the DAQ group more clearly defined (need to follow-up on their interface spec).

- Something like commands required to be understood by ETC (e.g. “get time”). Likely 1 duplex optical fiber for each ETC

Timeline for standalone ePIC FELIX about 1 year, integration with ETC for testing certainly possible on that timescale

Collaboration Priorities



INPUT from the Collaboration

Express on Monday via the “small group exercise”

thank you to all the collaborators who contributed!

Synthesis of the outcome by the SP-office and the Coordinators: 5 main points identified

- **Need of better communication within the collaboration, across multiple different entities**
- **Evolve technical coordination into less of a reporting body, with a proactive coordinating effort supporting the DSC's**
- **Workforce and Engagement**
- **Need a better way to grow/onboard analysis efforts**
- **Need to define a set of 2025 milestones for progress in simulations**

Ongoing discussion with the TC office on the more optimal organization including 1:1 with DSC (BIC planned for next week)

Collaboration Priorities

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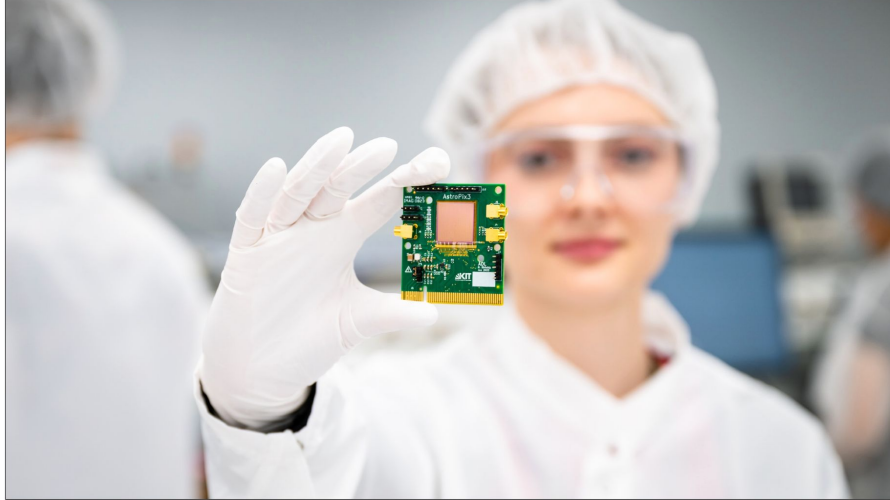
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- **Need of better communication within the**
- **Evolve technical coordination into less of**
supporting the DSC's
- **Workforce and Engagement**
- **Need a better way to grow/onboard analysis efforts**
- **Need to define a set of 2025 milestones for progress in simulations**

- **final preTDR within 2025, namely by timelines:**

- Final text from DSCs by June2025
- Text polishing and homogenized by an editorial panel by September2025
- 2 parallel reviews(internaland external) in October and November2025
- December2025: finalization by the editorial panel
- **The goal is to be ready for a detector CD-2 as early as 2026**
- *TDR following in 2026 towards CD3*

BIC Big Winner of First ePIC Photo Contest!



AstroPix: Innovation at My Fingertips

Maria Zurek

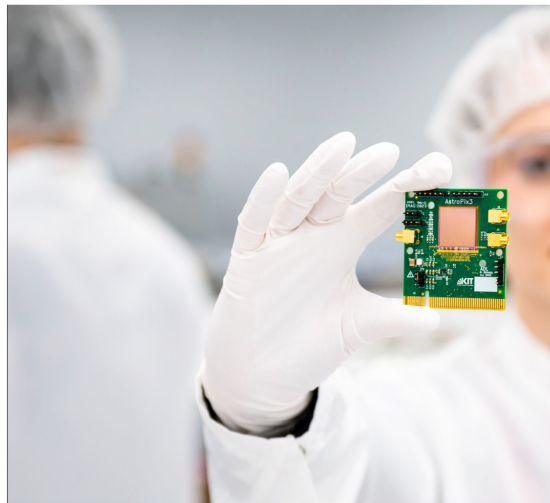


Installing the Baby BCAL at Fermilab

Sylvester Joosten

BIC Big Winner

Contest!



AstroPix: Innovation at My Fingertips



Sylvester Joosten



Backup

Preparation for CD-2 and CD-3 w/ Subprojects

Requirements

- EIC is a single, integrated line-item project.
- Subprojects will have well-defined deliverables and interfaces.
- Completed subprojects will enable the start of the EIC “early science program.”
- Annual funding profile for the subprojects must be consistent with DOE guidance.

Potential EIC Subprojects:

Subproject 1: Hadron storage ring modifications, electron storage ring, and infrastructure

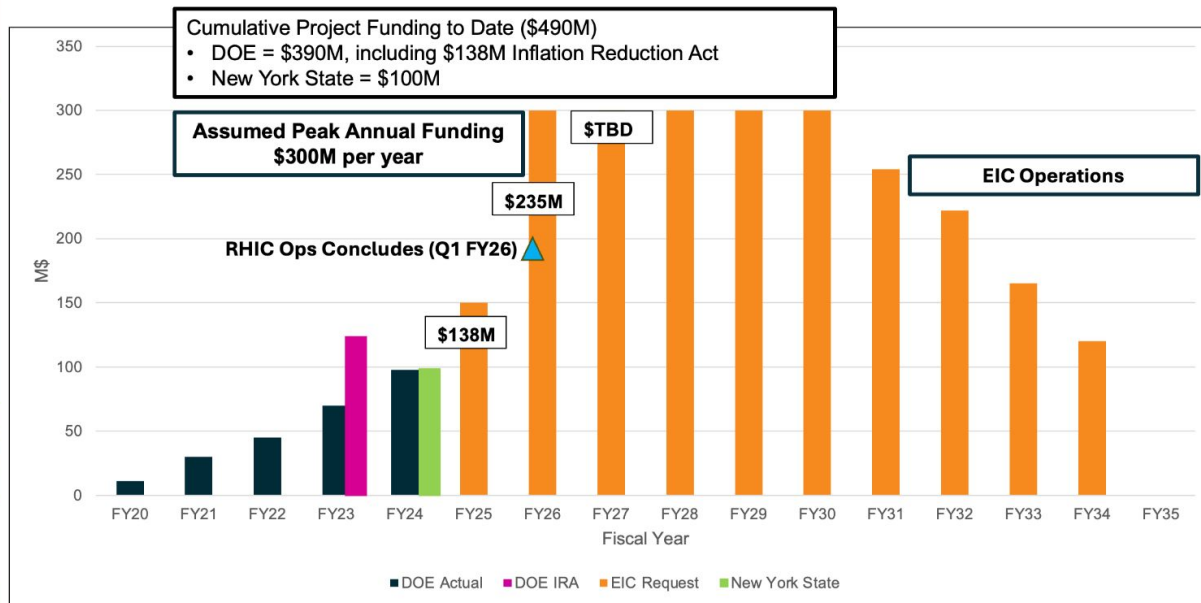
Subproject 2: IR integration, IR superconducting magnets, ePIC detector

Subproject 3: Electron injector systems and related infrastructure

Start Science Program

Subproject 4: RF power, 41 GeV by-pass, 18 GeV capability

EIC Project Funding Plans (Version 4.2 → V5)



FY2025 Funding TBD

EIC Plan: \$150M
 DOE Request: \$113M
 House: \$128M
 Senate: \$138M
 CR: \$98M

FY2026 Funding TBD

- RHIC operations conclude end of 2025.
- EIC project transitions to construction.
- Reduced RHIC operations funding maintains the injector complex and the removal/repurposing of equipment.

EIC Proposed Annual Funding Plan, Version 4.2, Prior to FY2025 PBR (\$M)

FY20	FY21	FY22	FY23	FY24	FY25	FY26	FY27	FY28	FY29	FY30	FY31	FY32	FY33	FY34	Total
11	30	183	70	98	150	300	300	300	300	300	254	222	165	120	2,803

Upcoming PDR ~August 2025

Detector Reviews planned for 2025

Preliminary Design Reviews (60% design maturity equivalent, called PDR, PDR2 or PDR3, pending the subsystem)

- PDR2: MPGD Tracking Detectors (6.10.03.02) – **Summer 2025** – exact timing linked to progress on first engineering test articles
- PDR2: Silicon Tracking Detectors (6.10.03.01) – Fall 2025 – After early results of ITS3 ER2
- PDR2: Cherenkov-based Particle Identification Detectors (6.10.04; pfRICH, hpDIRC, dRICH) – **early March 2025**
- PDR2: AC-LGAD-based Particle Identification Detectors (6.10.04; BTOF, FTOF, common systems) – Fall 2025
- PDR3: Barrel EM Cal (6.10.05.02) – ~August 2025
- PDR2: Backward HCAL (6.10.06.01) – ~September 2025
- PDR: Magnet Cryogenics and infrastructure (6.10.07) – September/October 2025
- PDR3: Electronics/DAQ-computing (6.10.08. 6.10.09.01) – **Late August 2025** – this does not include slow controls
- PDR: DAQ-Slow Controls (6.10.09.02) – November/December 2025 – Later to ensure integration DAQ in the collider common platform
- PDR: Integration, Infrastructure and Installation (6.10.10) – September/October – everything outside GST, includes cradle, HCAL, etc.
- PDR: Integration, Infrastructure and Installation (6.10.10) – November/December 2025 – everything inside GST
- PDR3: IR Integration and Auxiliary Detectors (6.10.11) – November/December 2025 – includes 6.10.14 lumi detector
- PDR2: Polarimetry (6.10.014) – September/October 2025

Final Design Reviews (FDR):

- FDR: Backward & Forward EM Calorimetry, Barrel & Forward HCAL (6.10.05.01; 6.10.05.03; 6.10.06.02; 6.10.06.03) – **May 2025**

Project Reviews:

- ✓ OPA CD-3B Review – January 7-9, 2025
- OPA Project Status Review – Summer 2025 (~6 months after CD-3B Review)

Other Meetings:

- Detector R&D Day hosted by ePIC and EIC Project: **~April 2025**
- DAC Meeting – **Spring 2025** – Comprehensive look to design status and readiness for CD-2. Plan for 3-4 separate days to split topics.
- 5th RRB Meeting: June 5-6, 2025 – Prague, Czech
- ePIC Software & Computing review by host labs: ~April 2025 for status check?

Tentative EIC schedule



- Detector part of Sub-Project 2
- Tentative CD2/3 review Q1 FY27 (~Dec 2026), OPA approval around April 2027

Inferred BIC Schedule

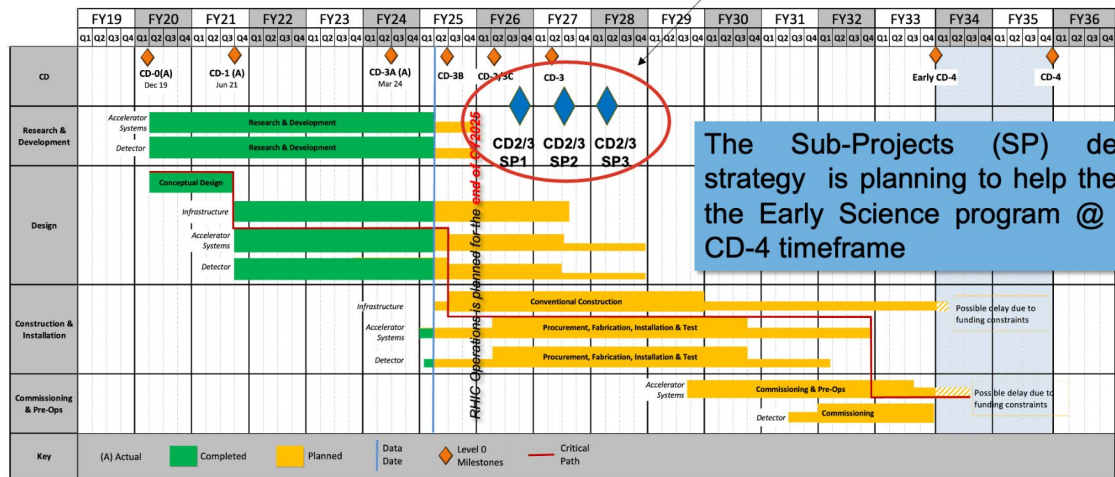
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Notional – project plan to be defined and reviewed in 2025

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The Sub-Projects (SP) delivery strategy is planning to help the start the Early Science program @ Early CD-4 timeframe

Since CD-1, the critical path is on the Accelerator systems.