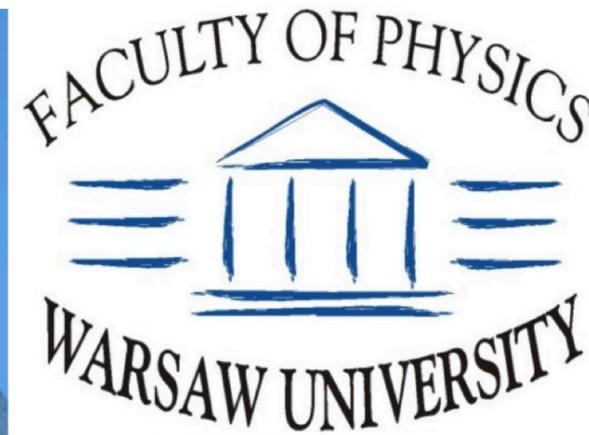


EIC User Group Meeting in Warsaw, Poland — July 23–31, 2023



Thank You!

Thanks to our hosts for this wonderful venue and support!



• candela •

7/29/2023

ePIC Warsaw Collaboration Meeting

Electron-Ion Collider User Group Meeting

The world's most powerful microscope for studying the "glue" that binds the building blocks of visible matter

- Early Career

EICUG 2023

International Advisory Committee:

- E. C. Aschenauer (BNL)
- S. Dalla Torre (INDN Trieste)
- A. Deshpande (CFNS, Stony Brook U. & BNL)
- R. Ent (JLab)
- R. Fatemi (U. Kentucky)
- P. Nadel-Turonski (CFNS, Stony Brook U.)
- M. Radici (INFN Pavia)
- J. Rittenhouse West (LBNL)
- E. Sichtermann (LBNL)
- P. Sznajder (NCBJ)

Local Organising Committee:

- T. Altinoluk (NCBJ)
- B. Badetek (U. Warsaw, chair)
- D. Kikoła (WUT)
- M. Suster (Candela F., U. Warsaw)
- P. Sznajder (NCBJ)
- J. Wagner (NCBJ)

JULY 23 - 31 2023
Warsaw

indico <https://indico.cern.ch/e/EICUG2023>

Very well organized event(s) — e.g. full-time presence of medical professional :-)
still no “silver bullet” for remote participation :-)

From: F. Celiberto's summary of the Early-Career workshop during the ePIC collaboration meeting:

Funding Theme Sheet 2021-2023

	Jefferson Science Association (JSA) 	JLAB 	BNL 	CFNS @ SBU 	European Physics Journal (EPJ) 	Yearly Total
2021	10k	5k				15.0k
2022	10k	5k	5k	2.5k		22.5k
2023	10k	5k		2.5k	1k	18.5k
Total	30k	15k	5k	5k	1k	56k

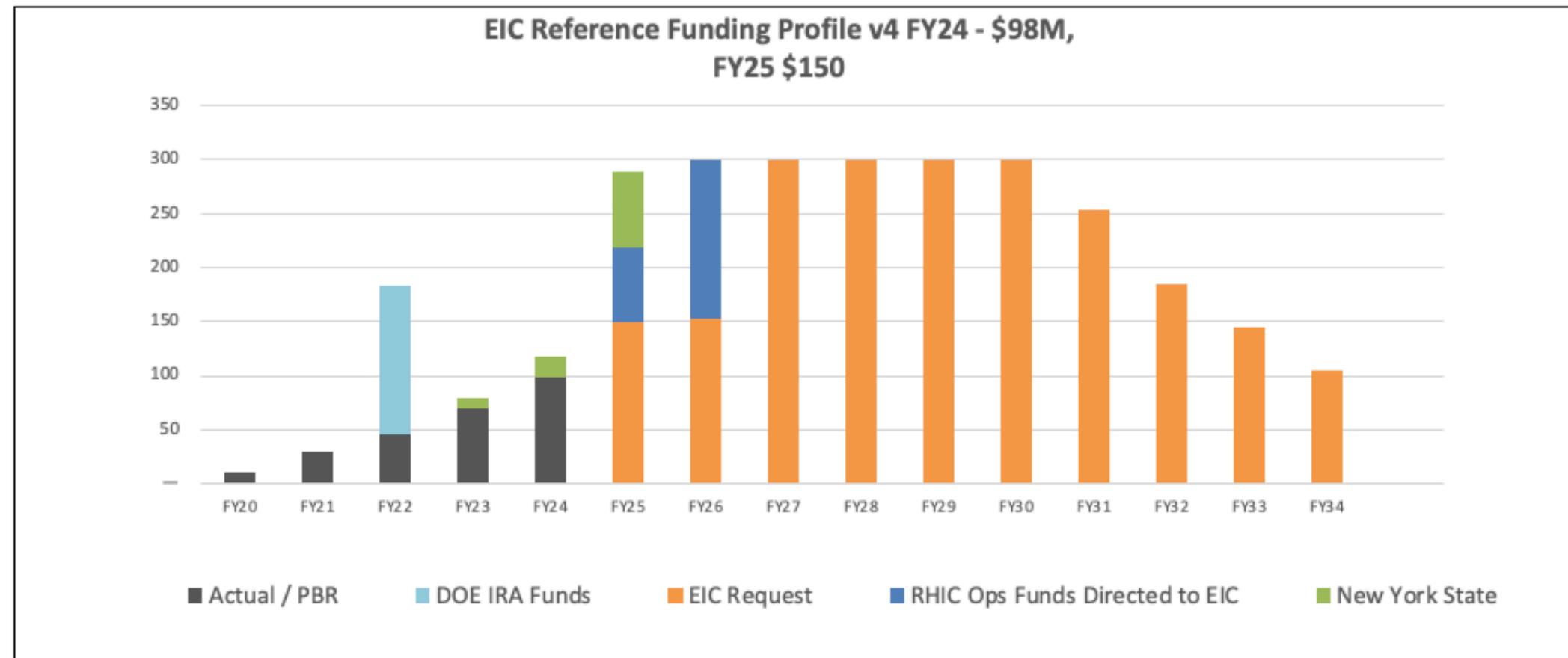
Total funding received: 56k! Thank all funding sources!

15

The early-career workshop itself certainly had an attractive agenda — invited speakers (Ent, Maas, Forte) and early-career contributors!

Lesson learned: untapped funding potential at BNL?

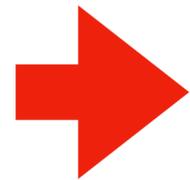
EIC Reference Funding Plan



- DOE Inflation Reduction Act funding of \$138M allocated at very end of FY2022. FY2023 funding is \$70M. DOE request and U.S. House Mark for FY2024 is \$98M.
- RHIC shut down planned for end of June 2025. Significant RHIC Operations funding will be redirected to EIC construction starting in FY2025 and reaching ~\$150M/year in FY2026.
- Current funding request supports DOE CD-3A, Long Lead Procurement Approval (LLP), in January 2024. LLP items mitigate risks: technical, supply chain, inflation, and schedule.
- FY2025 request is a major challenge given the Fiscal Responsibility Act signed earlier this month.

Funding and DOE Critical Decisions

- Inflation Reduction Act (IRA) funding of \$138M provided at the end of 2022 supports CD-3A, Long Lead Procurement Approval, plans
- FY2024 funding is expected to be \$98M
- Substantial redirection of funding from RHIC operations into EIC construction starting in 2025
- FY2025 funding will be critical to achieving the CD-2/3 approval schedule
 - Priority is securing CD-2 prior to planned conclusion of RHIC ops in 2025 and the efficient transition from RHIC ops into EIC construction



What Is Coming Up – TDR

We will start the process of writing a draft TDR later this year, and then this will continue towards a first version of a TDR in 2024.

Working model will be similar as we used to create the CDR, Elke/Rolf with engagement of ePIC leadership, and a mix of the project CAMs and EPIC WG representatives. At the late phases the editing rights will become more restricted. We plan to use where we can input from the CDR, YR, proposals, technical notes, etc.

Chapter 2: Physics Goals and Requirements (*should be short, < 50 pages*)

- 2.1 EIC Context and History (like CDR 2.2 or YR section 1)
- 2.2 The Science Goals of the EIC and the Machine Parameters (like CDR 2.3)
- 2.3 The EIC Science (follow YR structure)
- 2.4 Scientific Requirements

Chapter 3: Interaction Region 6 Overview (Elke/Rolf contributing)

Chapter 8: Experimental Systems (*can be long such that we can use as standalone detector TDR*)

- 8.1 Experimental Equipment Requirements Summary (like CDR 8.2)
- 8.2 General Detector Considerations and Operations Challenges (YR 10, CDR 8.3)
- 8.3 EIC Detector
- 8.4 Detector R&D Summary
- 8.5 Detector Integration
- 8.6 Detector Commissioning and Pre-Operations

Chapter 11: Commissioning (Elke/Rolf contributing)

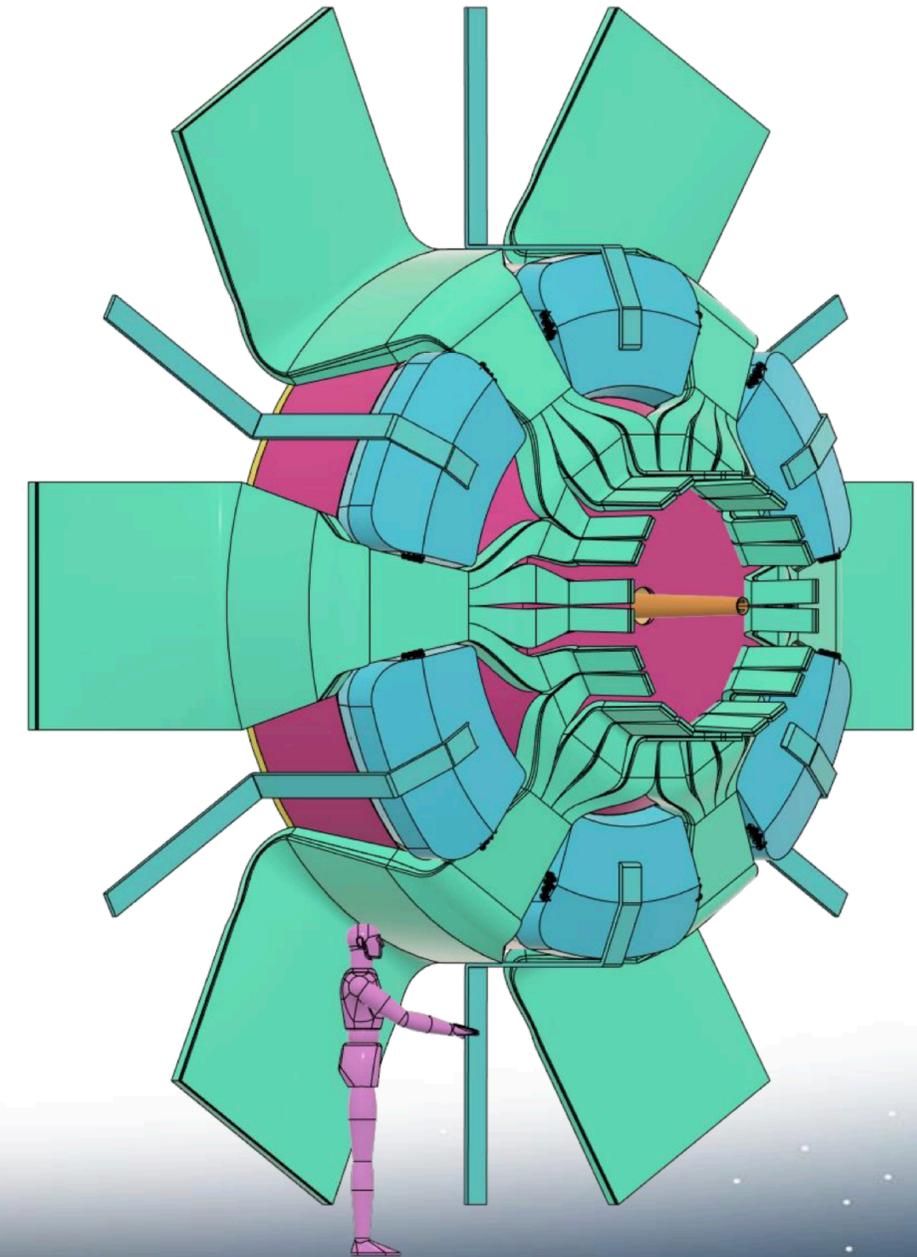
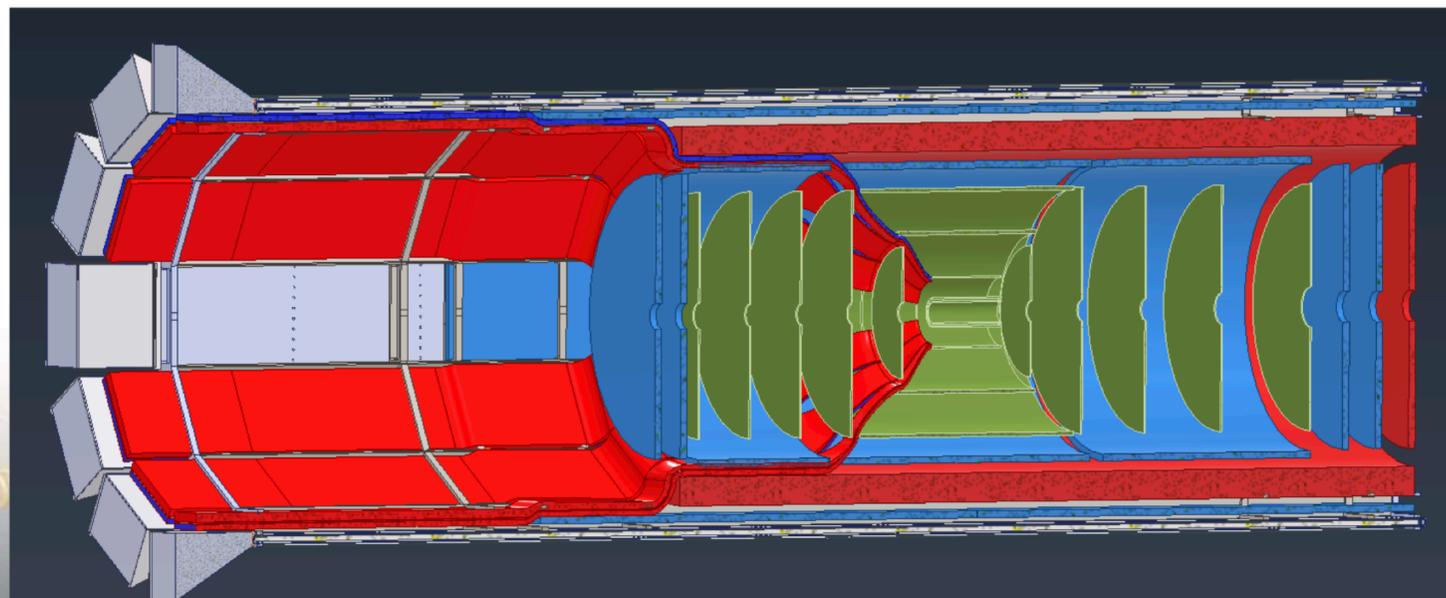
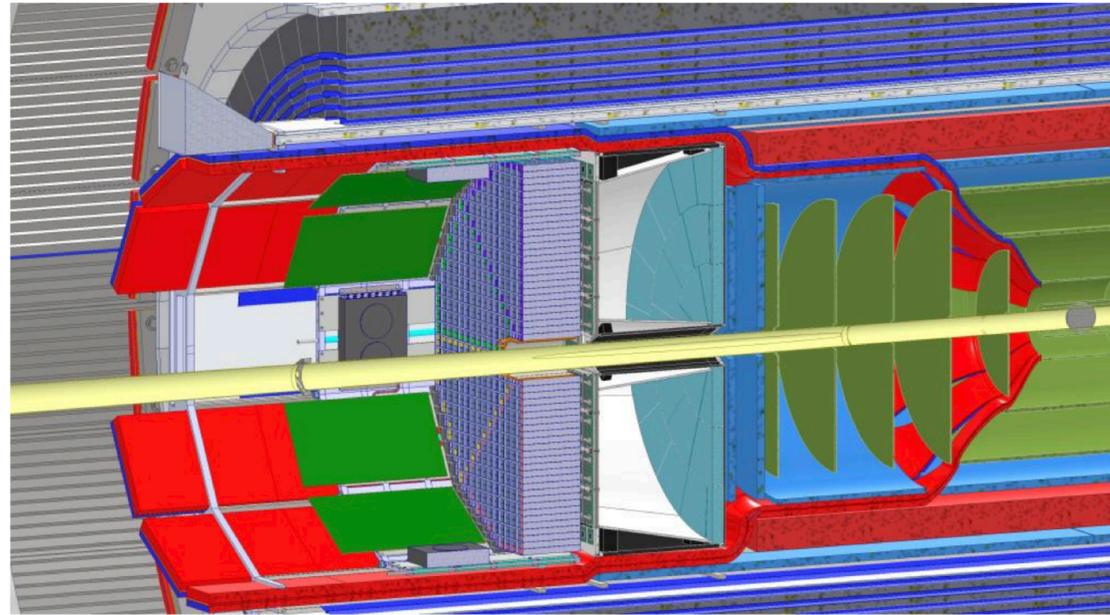
Appendix-B: Integration of a Second Experiment (mainly emphasizing feasibility, luminosity sharing, polarization with two experiments, and first-order checks of magnets/acceptance)

EIC History and Plans

Event	Date
CD-0, Mission Need Approved	December 2019
DOE Site Selection Announced	January 2020
BNL - TJNAF Partnership Agreement Established	May 2020
CD-1, Alternative Selection and Cost Range Approved	June 2021
CD-3A, Long Lead Procurement	January 2024
CD-2/3, Performance Baseline/Construction Start	April 2025
RHIC Shut Down	June 2025



Services Layout and Management



Electron-Ion Collider

Luminosity Sharing with two IRs

- Both electrons and hadrons are at the **beam-beam limit** with one collision point – they would not “survive” a second IR
- To enable **two collision points**, both electron and hadron bunch **intensity would have to be reduced by a factor two** – resulting luminosity at each IR would be **factor 4 smaller**
- Instead, we modify the fill pattern such that half the bunches collide in IR6, while the other half collides in IR8
- As a result, total luminosity is preserved, and **each detector gets half of the total** – a maximum $5e33$ each instead of $1e34$ with a single IR

ePIC Collaboration Meeting

Stickers!



All you can eat...

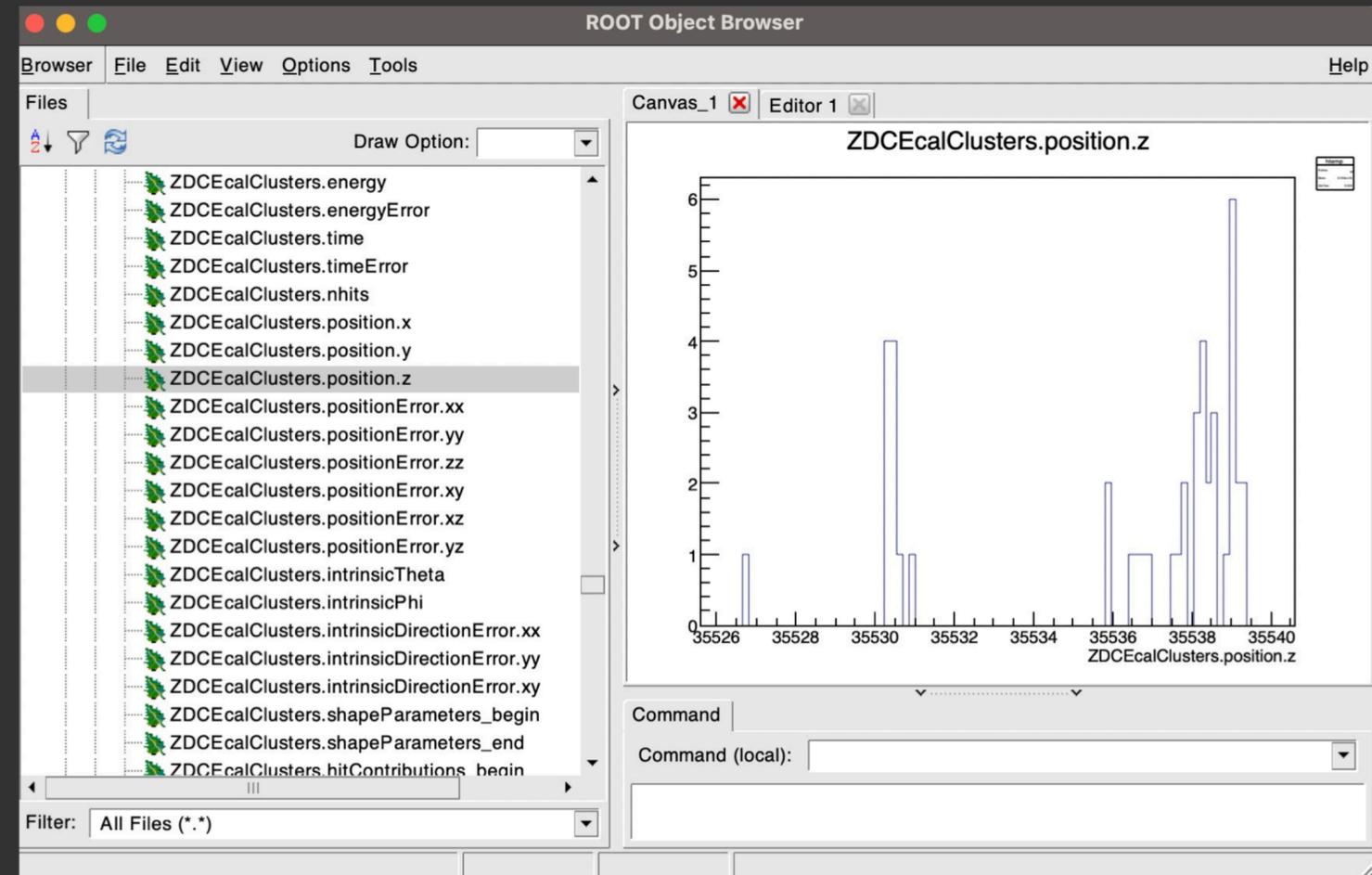
Many flavors of summary talks — hopefully a lesson learned going forward...

Until yesterday... a mini-workfest

One hour later, full simulation results made.



Thanks Barbara for finding us a room...



Scope of the Generic Detector R&D Program

This program will support advanced R&D on innovative, cost-effective detector concepts which reduce risk and that either the one detector in the project scope or a second detector could incorporate. (The term "generic" conveys this duality.) The program is supported through R&D funds provided to Jefferson Lab by the DOE Office of Nuclear Physics, and is open to all segments of the EIC community. It is expected to be funded at an annual level of \$2M, subject to availability of funds from DOE NP.

In a nut-shell:

- EIC-related R&D
- **Aimed at Detector 2**, or upgrades of Detector 1
- Proposals accepted from across the world from universities, laboratories, and companies
- Features of a proposal that add value: reduce risk, cost effective, increase physics scope, innovative, etc

(Also: we need to stay orthogonal to other sources of US federal funding such as EIC project R&D, the SBIR program, etc.)

From: D. Mack's presentation at the Detector-2 Workshop:

2023 Submissions

EICGENR&D2023 Proposal Number (1 thru 21)	Title	PI(s)	Institution(s)	Budget Request \$US	Status (New or Otherwise)
1	A Fast Timing MAPS Detector for the EIC	X. Li	LANL	211, 586	New
2	Towards a Few-Degree Calorimeter: bridging the Q^2 gap to support the quest for gluon saturation	M. Arratia	UC Riverside	135,000	New
3	Generic glass scintillators for EIC Calorimeters (ScintCalEIC) R&D	T. Horn	CUA	95,333	Continuing
4	Feasibility of Organic Glass Scintillators for EIC ZDC	G. Carini, E. Aschenauer	BNL Instr. Div., BNL Physics Div.	300,000	New
5	Slim Edge for LGADs	G. Giacomini	BNL Instr. Div.	130,000	New
6	Photonics-Based Readout and Power Delivery by Light for Large-Area Monolithic Active Pixel Sensors	S. Mandal, S. Rescia	BNL Instr. Div.	150,000	New
7	R&D for a new concept EIC nucleon polarimeter based on chemical hyperpolarisation	D. P. Watts	U. of York	159,000	New
8	Pressurized RICH	M. Contalbrigo	INFN Ferrara and U. Ferrara	75,000	New
9	Z-Tagging Mini DIRC	C.E. Hyde, Wenliang Li	ODU, SBU and CFNS	117,000	Resubmission
10	Large-Area Monolithic Active Pixel Sensors Combining High Spatial and Temporal Resolution	D. Gorni	BNL Instr. Div.	120,000	New
11	Design, Fabrication and testing of a multi-channel System on a chip for Low-Power High-Density High Timing Precision Readout ASIC for AC-LGADs (HPSocv3)	L. Macchiarulo, B. Schumm	Nalu Scientific, UC Santa Cruz	221,500	Continuing
12	R&D of 4D Detectors with EICROC and AC-LGAD at EIC consolidating a US-Japan Consortium	P. Tribedy, K. Shigaki	BNL Instr. Div., Hiroshima U.	152,585	New
13	Performance of GridPIX Detector in Magnetic Field with low mass and high efficiency CO2 cooling	T. K. Hemmick, P. Garg	SBU and CFNS, Yale U.	80,193	Continuing
14	Development of High Precision and Eco-friendly MRPC TOF Detector for EIC	Zhenyu Ye, Zhihong Ye	UI at Chicago, Tsinghua U.	120,000	Resubmission
15	Fabrication and characterisation of the Trench Isolated Low Gain Avalanche Detectors for 4D tracking	S. Gardner	U. Glasgow	157,000	New
16	Development of Double-sided Thin-Gap GEM- μ RWELL for Tracking at the EIC	K. Gnanvo	Jlab	238,502	Continuing
17	Scintillator Fiber Trackers for the ZDC and off-momentum detectors	C. Ayerbe Gayoso	College of William and Mary	39,500	New
18	Continuation of EIC KLM R&D Proposal	A. Vossen, W. W. Jacobs	Duke U., Indiana U. CEEM	133,000	Continuing
19	Superconducting Nanowire Detectors for the EIC	Sangbaek Lee, W. Armstrong	ANL	60,000	Continuing
20	Development of a Novel Readout Concept for an EIC DIRC	G. Kalicy, J. Schwiening	CUA, GSI	125,000	Continuing

Is this really working in attracting new members into the community?

Saying the Quiet Part Out Loud

What does it mean that the number of proposals dropped from 30 to 20?

I estimate that roughly half is what I would call “healthy self pruning”, in that

- proposals better suited for the project (but not funded by the project), have not returned.
- proposals effectively asking for operations grants for poorly focused R&D have not returned.
- proposals that were far too expensive for the generic R&D program have not returned.
- a small backlog of proposals of the “one year and done” type have been fed.

The other half is almost certainly funded proposals with multi-year programs who didn't resubmit because they recently got their money.

This has to get better. And despite the fact that there are major aspects which Jlab does not control, it will get better.

Is this really working in attracting new members into the community?

The new program appears neither better funded nor longer than the previous program,

Multi-year ripple effects are a concern.

2023 Submissions: Preliminary Topical Breakdown

Organizing proposals by topic helps make the pile less over-whelming, and helps shepherd us toward a balanced program. Most of the topics below will be perennials, but we may add/drop a few topics from year to year. So far, it looks like I can use the same topics as last year:

Topic	# of proposals submitted	Requested Funds
Calorimetry	4	\$663K
PID (non-TOF)	4	\$397K
Gaseous Precision Timing and/or Tracking	2	\$359K
Front End Electronics	1	\$222K
Silicon Detectors	6	\$710K
Software Supporting Electronics/Detector Design or Physics Program	0	\$0K
"Other New Detectors"	2	\$100K
Studies to Support or Expand the Physics Program	1	\$159K

Budget request is \$2.6M for about \$1.3M in disburseable funds, hence we are a factor of 2 over-subscribed.

(Last year we had more proposals, and they were more expensive on average, so the over-subscription was a factor of 3.6 . Tough choices were made. Certainly some good proposals could not be funded.)

The proposals can be found at [https://www.jlab.org/research/eic rd prgm/receivedproposals](https://www.jlab.org/research/eic_rd_prgm/receivedproposals) .