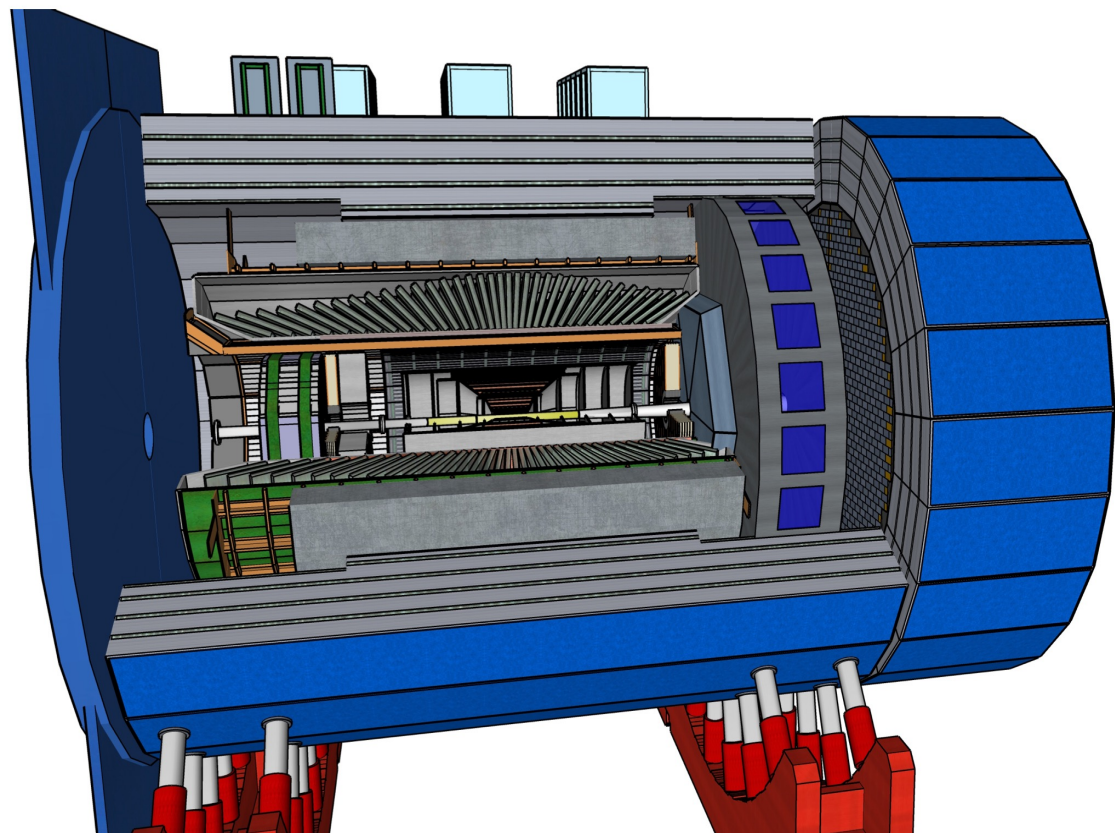




EIC Comprehensive Chromodynamics Experiment



23rd Bi-Weekly Meeting

Or Hen, Tanja Horn, John Lajoie



Today's Agenda

- Overview of DPAP review process and conclusions
+ initial 'lessons learned' from panel report
- Initial discussion on path forward
- Bylaw committee report



Today's Agenda

- **Overview of DPAP review process and conclusions
+ initial 'lessons learned' from panel report**
- Initial discussion on path forward
- Bylaw committee report

Recap: Proposal Review Process



- Proposal submitted on Dec. 1st
- Public presentations to DPAP Panel on Dec. 13th and 14th
- Follow up questions from both DPAP and DAC received before the Winter break; ECCE response submitted soon after the break
- Second review session with DPAP on Jan 19th. Closed session attended by members of the SC and Teams and WG conveners.
- Public presentation of final DPAP recommendations on March 8th

DPAP Review & Recommendations



The panel unanimously recommends ECCE as Detector 1.

The proto-collaboration is urged to openly accept additional collaborators and quickly consolidate its design so that the Project Detector can advance to CD2/3a in a timely way.

The EIC's project planning for Detector 1 should incorporate a period for integrating new collaborators and re-optimizing experiment conceptual design in advance of CD-2.

DPAP Review & Recommendations



The panel unanimously recommends ECCE as Detector 1.

Questions to explore today:

- How and why did they reach this conclusion?
- What lessons should we carry forward from the DPAP review and findings?

DPAP Review & Recommendations



The panel reviewed the proposals in 5 main areas:

- 1) Physics Performance,
- 2) Detector Concept and Feasibility,
- 3) Electronics, DAQ and Offline
- 4) Infrastructure, Magnet and Machine Detector Interface, and
- 5) Collaboration and Management.

The findings are based on the proposals, presentations, discussions between the panel and the proponents, as well as individual discussion with the management of the proto-collaborations.

Physics Performance

*... the panel expects that **either detector (ATHENA / ECCE O.H.) will be able to fully realize the baseline physics case** and to make significant contributions in areas beyond*

Showing ability to deliver on the full EIC science program was our main goal from day one.

This is a remarkable achievement by the ECCE teams and the EIC community as a whole!

Detector Concept and Feasibility



ATHENA and ECCE satisfy the requirements to fulfil EIC's "mission need" statement

*The more **limited range of new technologies and the reuse of the BABAR Magnet and the sPHENIX HCAL** make ECCE less expensive and more likely to be ready for **data taking** on time for Critical Decision 4A (CD-4A), the start of EIC accelerator operations, and therefore suitable as Detector 1.*

The eRDs have enabled... very compelling detector concepts.

One of the main differences among the three detector concepts is the magnetic field strength ... **The panel could not find a clear example where the lower field used by ECCE would lead to a physics loss.**

The use of more technologies, even if they have been already implemented in other experiments, can still lead to delays in the detector construction.

Detector Concept and Feasibility



ATHENA and ECCE satisfy the requirements to fulfil EIC's "mission need" statement

*The more **limited range of new technologies** and the reuse of equipment
and the **sPHENIX HCAL** and the **ALICE** detector
data taking on time
operations, and the*

The eRDs have

*One of the main goals is to
strength ... The
ECCE would lead to a project*

The panel validated the strategic reuse of equipment (when not jeopardizing the physics performance), and the reduction of risk by implementing a limited range of appropriate technologies.

Continued collaboration with the detector consortia and a focused detector R&D effort will be essential moving forward

The use of more technologies, even if they have been already implemented in other experiments, can still lead to delays in the detector construction.

Electronics, DAQ and Offline



The design ... described in all three proposals was informed by activities undertaken as part of the eRD23 project.

ECCE readout is assessed to carry a slightly lower risk, as it is based on a **smaller number of ASICs of which most are already available**

It is important to understand and monitor the long-term availability of different chip technology nodes on which a detector default baseline and fallback ASICs depend.

In general, the development and production of specialized readout ASICs is a risk to the schedule and cost of the project ... required further R&D work ... focus of the eRD104 / eRD111 ... eRD112 R&D project.

Electronics, DAQ and Offline

The design ... described in all three proposals was informed by activities undertaken as part of the eRD23 project.

ECCE readout is a **smaller number of ASICs**

It is important to consider **different chip technologies** and **different ASICs** that **depend** on the **ASICs** used.

Readout ASICs development is a risk we should pay close attention to, especially for Si detectors (MAPS, AC-LGAD)

The eRD efforts to develop MAP and AC-LGAD readout ASICs are crucial.

In general, the development and production of specialized readout ASICs is a risk to the schedule and cost of the project ... required further R&D work ... focus of the eRD104 / eRD111 ... eRD112 R&D project.



Infrastructure, Magnet, and Machine Detector Interface

No major concerns regarding the infrastructure needed for the detectors

pleased to note ... the proto-collaborations are already engaged in a fruitful discussion with the host lab and we encourage them to keep doing so

Crucial that the recommended experiment **provide high quality maps of the magnetic field** over all the IR space

for all the experiments, the design of the forward region was less mature in comparison to the central detector ... we encourage the recommended proto-collaboration to **further develop the design in close concert with the accelerator group.**

Infrastructure, Magnet, and Machine Detector Interface

No major concerns regarding the infrastructure needed for the detectors

**pleased to note
discussion with**

Strengthen and extend our communication with the project to evolve designs from the conceptual to technical stage.

Crucial the
magnetic f

Engage with sPHENIX on the mapping and operations of the BaBar solenoid.

for all the experiments, was less mature in comparison to the central detector ... we encourage the recommended proto-collaboration to **further develop the design in close concert with the accelerator group.**

Management and Collaboration



Detector 1 must be developed and constructed within a very demanding schedule and within a tightly constrained budget

Collaboration planning ... must account not only for the expertise and effort necessary for construction of the detector; it must also account for future needs to commission the detector and then to operate and maintain the experiment.

The proto-collaboration for a concept selected for Detector 1 must be open to:

- (1) integrating new collaborators** in a manner that enables them to make contributions that impact the capabilities and success of the experiment in significant ways, including some new collaborating individuals and groups **into positions of responsibility and leadership**; and
- (2) integrating new experimental concepts and technologies that improve physics capabilities without introducing inappropriate risk.**

Management and Collaboration



... **none of the three proto-collaborations is yet large enough or strong enough** for successful development of a detector for Day 1 of the EIC

Consideration of diversity, equity, and inclusion has been thoughtfully incorporated into the conception and structure of all three proto-collaborations.

ECCE emphasizes capability to “evolve” and “realign” after proposal review ... **a consortium that will evolve into a collaboration as new groups join.** It presents a tentative, initial organizational structure, one that is quite thoughtful and reasonable, with the expectation that the collaboration will eventually determine its organizational structure. ECCE puts **emphasis on capability to integrate new groups with maximum benefit**, and expressed **openness and flexibility regarding incorporation of newcomers and their ideas into its plans.** Thus, ECCE appears to be well positioned to make use of the talents and resources of the full community.

Management and Collaboration

... **none of the three proto-collaborations is yet large enough or strong enough** for successful development of a detector for Day 1 of the EIC

Consideration of diverse perspectives was integrated into the conception and development of the collaboration.

The panel endorsed our approach to the management and formation of a new collaboration.

ECCE emphasizes a **collaborative environment that will evolve** into a scientific collaboration capable of pursuing the EIC science mission.

that the collaboration has a flat organizational structure. ECCE puts **emphasis on capability to integrate new groups with maximum benefit**, and expressed **openness and flexibility regarding incorporation of newcomers and their ideas into its plans**. Thus, ECCE appears to be well positioned to make use of the talents and resources of the full community.

Overall Conclusion

- Panel seems very supportive of the ECCE approach to:
 - Reduce cost and risk via the strategic reuse of equipment and the choice to limit the number of technologies used through the detector. We should keep this approach moving forward.
 - Evolve to a full collaboration in the near future, utilizing the added clarity provided by the DPAP report and the project response to it.
- It is vital that we keep the EIC community united as we adopt the review conclusions, further develop the detector design, and move forward towards CD-2.
- Continued collaboration with the detector consortia and a focused detector R&D effort will be essential moving forward
- Electronics are especially high-risk these days. Should pay special attention.

→ there is room for all community members to get involved at all level of the collaboration's work



Today's Agenda

- Overview of DPAP review process and conclusions
+ initial 'lessons learned' from panel report
- **Initial discussion on path forward**
- Bylaw committee report



**KEEP
CALM
AND
STUDY
NUCLEAR
PHYSICS**

ECCE's goal is to pull together the full EIC community and work with the project towards a rapid and successful realization of a technical design of the project detector for CD-2



March 8, 2022

Guiding principles

ECCE emphasizes capability to “evolve” and “realign” after proposal review ... **a consortium that will evolve into a collaboration as new groups join.** It presents a tentative, initial organizational structure, one that is quite thoughtful and reasonable, with the expectation that the collaboration will eventually determine its organizational structure. ECCE puts **emphasis on capability to integrate new groups with maximum benefit,** and expressed **openness and flexibility regarding incorporation of newcomers and their ideas into its plans.** Thus, ECCE appears to be well positioned to make use of the talents and resources of the full community.

With the completion of the EIC Yellow report (YR) study by the EIC Users Group (EICUG), ATHENA, CORE, and ECCE developed detector proposals in response to the “Call for Collaboration Proposals for Detectors” by the host laboratories, Brookhaven National Laboratory and the Thomas Jefferson National Accelerator Facility.

We would like to thank the Detector Proposal Advisory Panel for their careful, detailed review of our proposals and publicly express our confidence in both the review process and the recommendations of the panel. These recommendations provide the necessary guidance to work with the EIC project towards finalizing the design of a comprehensive, general-purpose experiment in preparation for DOE Critical Decision (CD)-2. We pledge to work together to leverage the body of work in the YR process, the detector proposals, and the EIC detector R&D program to realize a comprehensive, general-purpose EIC experiment and to work with the community, as a whole, towards realizing the EIC science program.

With this joint statement, we express our overarching desire to unite and engage the EIC community in the realization of a comprehensive, general-purpose experiment capable of the science program of the Community White Paper and NAS report at the future EIC. Scientists in ATHENA, CORE, and ECCE, as members of the EICUG community, will also continue promoting the realization of a complementary 2nd interaction region and detector.

Silvia Dalla Torre and Bernd Surrow – ATHENA
Charles Hyde and Pawel Nadel-Turonski – CORE
Or Hen, Tanja Horn, and John Lajoie – ECCE

Next steps

- Continue the publication effort.
- Work to evolve from the ECCE consortium and form a collaboration.
- Foundation:
 - ECCE proposal
 - DPAP guidance
- Hold discussions and define procedures:
 - Optimal process for the incorporation of new groups for the benefit of the community and project,
 - Mechanism for the collaboration to evolve the ECCE baseline design, possibly including alternative technologies and design choices consistent with cost and risk constraints,
 - Interaction with the various detector consortia,
 - ...

Next steps

- Meeting with labs and project leadership later today
 - DPAP issued recommendations, i.e. ECCE is not yet the project detector.
 - Main goal for the meeting is to share our thoughts of next steps to adopt and realize the DPAP recommendations and promote the EIC project towards CD-2.
 - Wish to also understand what's needed to define ECCE as the project detector, what input / actions are needed of us, what's the expected timeline.
- Meeting with EICUG SC + proto collaboration later today
 - A somewhat short, open ended, discussion to share initial feelings / thoughts.
- Meeting with ATHENA leadership on Monday
 - Share ideas on next steps for promoting the EIC project towards DC2.



Discussion time



Today's Agenda

- Overview of DPAP review process and conclusions
+ initial 'lessons learned' from panel report
- Initial discussion on path forward
- **Bylaw committee report**
(next talk by Vicki and Richard)

Next bi-weekly on March 21st. hope to have several of the
NIM publication presentations at this time