The EIC International Computing Organization
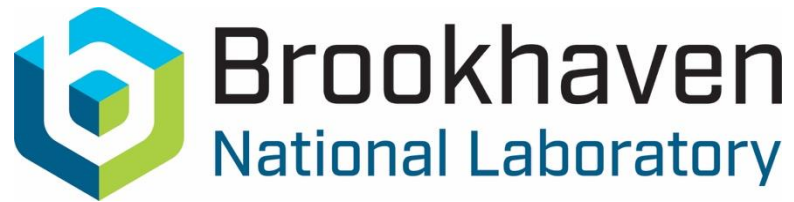
Alexei Klimentov

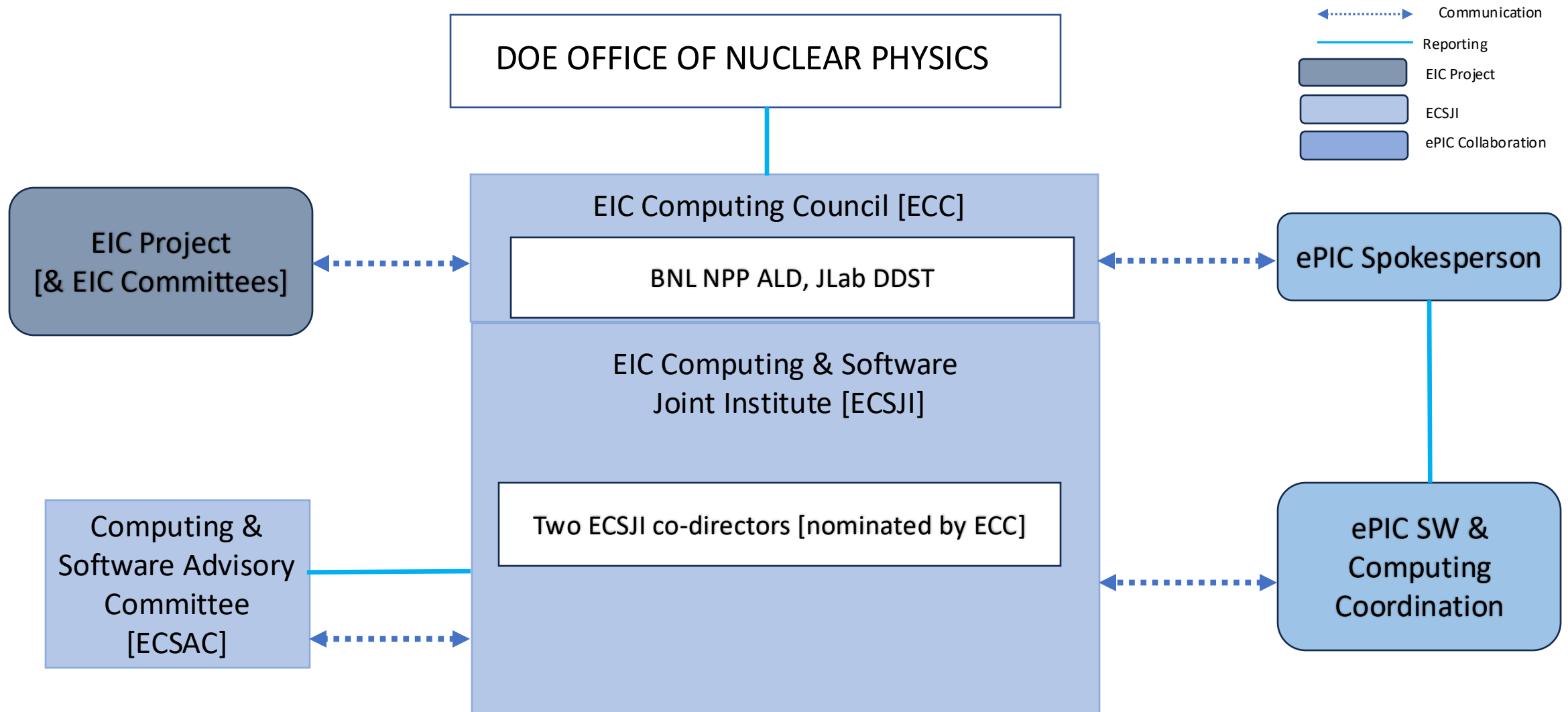aak@bnl.gov

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Review of ePIC Computing & Software October 6-7, 2025

Background. ECSJI

- The EIC Computing and Software Joint Institute (ECSJI)
  - Presented to the EIC RRB on Dec 7, 2023 ([ECSJI scope and panels](#))
  - Provides is a single entity, based in the host labs, to interface with the EIC program and the ePIC collaboration on computing and software issues.
    - Provides a venue for coordination on resources to leverage the unique strengths of both labs
  - The Institute Management [two co-directors, each nominated by one lab]
  - ECSJI co-directors have regular meetings with host labs management
    - To discuss how Computing and Software activities (personpower and resources) are supported by Labs
  - ECSJI co-directors have regular meetings with ePIC (spokesperson and deputy, SW&C coordinator) and EIC Management (Co-Associate Directors for the EIC Experimental Program)
    - Typically, bi-weekly – address host Labs < == > ePIC and host Labs < == > EIC project topics

EIC Computing, DOE Context

Background. EICO

- International Contributions for the EIC extraordinary computing needs were discussed in the RRB meeting in May 2024 in Rome and in November 2024 at BNL

- The proposed mechanism for managing the contributions at a technical level is the EIC International Computing Organization (EICO) to include representatives of the organizations contributing resources,

- EICO kick-off meetings in October 2024. Regular EICO/ECSJI meetings in 2024/25. These meetings are held every two weeks. EICO WG : Representatives of CA, FR, JP, IT, TW, UK, and ECSJI/ePIC.
  - The following points have been discussed in October 2024 – May 2025:
    - Organization of funding for Nuclear Physics computing at the national level.
    - Structure of computing for the EIC and for ePIC within each respective country.
    - Existing support and commitment for EIC computing.
    - ePIC Streaming Computing Model
    - EIC Computing in global context (WLCG, OSG, DUNE, SKA,…)
    - EICO boards and forums
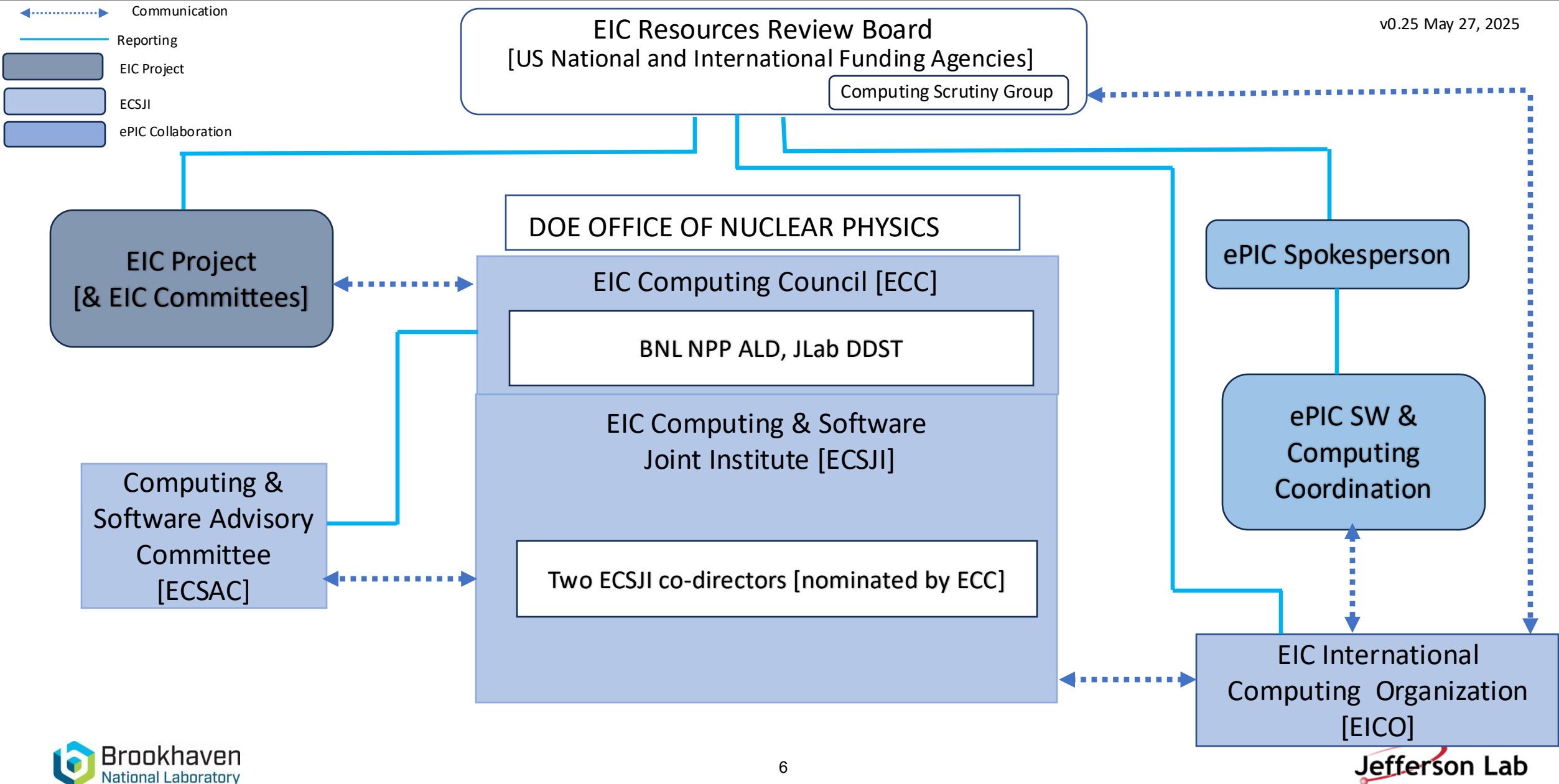   - EICO and RRB communication
    - Intellectual property

Background. EICO. Cont'd

- In-person meeting in April 2-3 at BNL[1] to complete first draft
  - *Drafting committee:*
    - *A.Boehnlein (Jlab), M.Diefenthaler (Jlab), A.Klimentov, (BNL)*
    - *A.Bressan(INFN)*
    - *R.W.L.Jones (Lancaster U)*
    - *T.Gunji (Tokyo U)*
    - *C. Munoz Camacho (ORSAY)*
    - *E. Yen (ASGC)*
- Addressed comments from IT and CA FA at EICO working group – 2nd draft of comments
- Addressed comments from EIC and ePIC stakeholders – 3rd draft out for comments
- Addressed comments from DOE NP – 4th draft out of comment
- The EICO may apply for observer status to the WLCG
  - It was discussed with WLCG and WLCG is in favor of this
  - EICO Overview Board Chairs will be PoC to WLCG
  - Utilization of WLCG network infrastructure by EIC computing is one of the topics to be addressed
- Follow-up discussions will be aligned with the EIC-RRB cadence

[1] the first day was co-located with Echelon0/1 mini-WS organized by ECSJI and ePIC SW&C

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EIC Computing, International Context

Major Elements from the Charter

- **EIC International Computing Organization** is led by the Institute's co-directors and administered by the ECSJI. This organization exists to provide computing resources, infrastructure, and services related to the EIC. The current focus is on the ePIC experiment. This will be extended to other foci as endorsed by the EIC RRB. Funding agencies will indicate the activities and services they will provide, and this will be approved by RRB. The EICO structure is formally documented in this charter.

- **EICO Overview Board.** The Overview Board (OB) oversees the functioning of the EICO. It is composed of a representative of each Institution that is a member of the EICO, the ECSJI directors and the Spokesperson(s) of each EIC Experiment with voting rights. The OB is co-chaired by EIC Computing Council Members (or one of ECSJI directors), which include a member of the OB appointed as a co-chair.
  - OB approves the report that details the accomplishments of the EICO, and the individual site metrics outlined in the cooperation agreement.
  - The OB has the responsibility to manage external relationships with partner organizations, such as WLCG
  - The OB also provides a resolution path for institutional issues relative to the cooperation agreement .

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Major Elements from the Charter. EICO Management Board

- **EICO Management Board :** The Management Board (MB) organises the work of the EIC Computing as a set of formal activities. It maintains the overall programme of work and all other planning data necessary to ensure the smooth execution of the work of the EIC Computing. It provides half-year progress and status reports to the OB. The MB membership includes the ECSJI directors, the Technical Heads of the Echelon 0, Echelon 1 and Echelon 2 Centres, the leaders of the major activities and projects managed by the Board, the Computing Coordinator of each EIC experiment, the Chair of the Technical Forum, a Scientific Secretary and other members as decided from time to time by the Board.   MB meetings are held on a regular basis (usually monthly). MB has several roles, including :
  - To broker and manage agreements between the resource centres and the experiment(s). In practice, this will require background agreements with other organisations that run various parts of the infrastructure, such as fabrics and storage operations, certificate authorities, network providers, etc.;
  - to broker and manage agreements between resource centres, and between resource centres and EIC host labs;
  - to review schedules, service performance, resource utilisation, etc. and decide about tools to be used to assess centers reliability and availability;
  - to oversee publications, communications, conference submissions, and speakers, where it concerns software and computing activities that are not completely within EIC experiment(s).

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Major Elements from the Charter. EICO Technical Forum

EICO Technical Forum : The Technical Forum (TF) is part of the EICO and represents in particular the computing centers (including Echelon 1 centers). The TF has several roles, including:

- o to exchange information;
- o to act as a forum for technical discussions and planning, including schedules, resources utilization and technical solutions, challenges and requirements;
- o to organize technical discussions related to production system and middleware, etc and make proposals to the MB;
- o discuss technical roadmap for the evolution of EIC facilities and services;

- The TF meetings are open to all interested members of the EIC computing.

- Other parties may be invited for topical discussions.

- The TF chairperson is appointed by MB for a two-year period.

- Extension is possible with full concurrence of OB. The TF reports to the MB.

- The chair of the TF is an ex officio member of the EICO Management Board.

- The TF may start and stop working groups when needed to address technical issues.

- TF shall provide regular (bi-monthly) updates on its activity to MB.

Open Questions for RRB Discussion

- The Charter establishes the EICO and outlines basic functions.

- There remains a need to establish ownership of the operating procedures and draft those procedures (if deemed necessary)

- Procedure for
  - Approval of the EICO charter and thereafter monitoring its execution.
  - Approval of Amendments and Addenda .
  - Resolution of disputes forwarded by OB.
  - Endorsement of new Members of the EICO on the proposal of the ECSJI.

- It is envisaged that the RRB has the following approval and oversight roles
  - Annual approval at its autumn meeting of the Computing Resource Levels pledged to the EIC Experiment(s) by the Institutions for the following year.
  - For each Institution, the Computing Resource Levels i) actually made available by the Institution and ii) actually used by each of the EIC Experiment(s) and EIC users are monitored centrally by the management of the ECSJI, which reports the figures for the previous year to the RRB at its spring meeting, along with the equivalent cost of providing these Computing Resource Levels at host labs. The RRB shall take note of the participation of the Institutions concerned, in terms of the Computing Resource Levels that were actually made available, and shall act accordingly.

Next Steps

- The RRB is responsible for approving the EICO charter
  - Presenting for comments in June 2025
    - The EICO presentation (and charter in general) was very well received by RRB
      - For many countries RRB members are working in EICO WG
  - Finalize in fall 2025
    - The RRB was asked to provide comments by 1 October.
    - The EICO charter will be presented to the RRB in November for final approval.

- Reopen the ECSJI charter
  - Rationalize wrt to the approved EICO charter as well as other changes (target: Spring 2026)

- EICO Working group drafts the EICO Cooperation agreement (Target: first draft Fall 2026)

- An appropriate working group drafts major procedural issues

- Documents to be prepared by the EICO WG and ECSJI after the EICO charter will be approved by the RRB
  - Cooperation agreement template
  - Echelon 1 and Echelon 2 requirements
  - EICO OB and MB composition and membership
  - …

Supplementary slides

EIC Computing and Software Joint Institute

- Brookhaven National Laboratory and Thomas Jefferson National Accelerator Facility, as Electron-Ion Collider host labs, have established a collaborative entity, the **EIC Computing and Software Joint Institute** (**ECSJI**). The Institute reports to the host Labs and the host Labs delegate functions to ECSJI (for instance, organize SW&C review)
    - This joint institute is designed to support the computing and software needs and activities of the EIC.
    - The Institute was created fall of 2023

- ECSJI leverages **complementary expertise at the two labs** and provides needed visibility to the respective lab management and stakeholders.
    - *The advantages of such a structure also include increased reliability and availability of resources for the ePIC collaboration and other future collaborations.*

- The success of the EIC, an international scientific endeavor, will benefit from contributions from international partners towards its computing effort.

- To facilitate efficient coordination, the Institute will administer the EIC International Computing Organization (EICO), which will include all the contributors to the EIC computing effort.

ECSJI charter (link)

ESCJI : Scope

The Institute will provide for EIC computing and software matters:

1) A single entity to interface with the EIC project, the ePIC collaboration, theoreticians, and future collaborators.

2) Execution of host lab responsibilities (link).

3) Maintenance of service level agreements and statements of work outlining the host labs' contribution to the ePIC collaboration concerning computing resources, services, and personnel assigned to work on ePIC computing and software deliverables.

4) A coordinating body for interacting with international partners, providing computing resources as in-kind contributions, including:

   - Assessing resources.

   - Managing the agreements with the sites delivering resources (including service levels).

   - Facilitating and assessing the delivery against the agreements.

The scope may evolve over time and the organization of the institute as well

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EIC Computing Organization & Governance.

- **Computing Council** (ECC)
  - Review the ECSJI strategic direction and support leadership in managing effective interfaces of the ECSJI to the EIC project and ePIC collaboration.
  - Authority: Approve the ECSJI strategic direction, leadership changes, annual budgets, resource allocations, and performance milestones.

- **The Institute Management** [two co-directors, each nominated by one lab]
  - ECSJI co-directors have regular meetings with host labs management
    - To discuss how Computing and Software activities (personpower and resources) are supported by Labs
  - ECSJI co-directors have regular meetings with ePIC (spokesperson and deputy, SW&C coordinator) and EIC Management (Co-Associate Directors for the EIC Experimental Program)
    - Typically, bi-weekly – address host Labs < == > ePIC and host Labs < == > EIC project issues

  - Duties and accountability:

    - The management is responsible for organizing the Institute to deliver defined responsibilities.

    - The management will maintain a multi-year operation plan for the host labs, providing matrixed staff members to support activities.

    - Institute management will provide a yearly report to the host labs' management.

WLCG Computing Resources Scrutiny Group

- The purpose of the C-RSG is to inform the decisions of the Computing Resources Review Board (C-RRB) for the LHC experiments.

- According to the WLCG, MoU the starting point of the scrutiny is the request information presented at the spring C-RRB meeting and any guidance that the C-RRB cares to give. From that moment the CRSG enters into a sustained dialogue with each experiment seeking to understand to what extent the computing resource requests are well motivated. The recommendations are presented in the RRB autumn meeting.

Every year the CRSG should scrutinize

- The resource accounting figures for the preceding year

- The use the experiments made of these resources

- The overall request for resources for every experiment for the following year and forecasts for the subsequent two years

- The CRSG shall also examine the match between the refereed requests and the pledges from the Institutions.

- The CRSG shall make recommendations concerning apparent under-funding This is the first time that such an independent and detailed scrutiny of the computing yearly request is carried out.

Glossary and Abbreviations

- AHM – All Hands Meeting
- CM – Computing Model
- E0, E1, E2 – Echelon0, 1, 2 sites according to ePIC computing model
- ECC - EIC Computing Council
- ECSAC – EIC Computing and Software Advisory Committee
- EICO – EIC International Computing Organization
- ECSJI – EIC Software and Computing Joint Institute
- HL-LHC – High Luminosity LHC Run

- IKC – in-kind contribution
- MB – Management Board
- OB – Overview Board
- OSG - Open Science Grid (NSF supported computing consortium)
- SLA – Service Level Agreement
- SW&C – Software and Computng
- TF – Technical Forum
- WLCG – World LHC Computing Grid

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