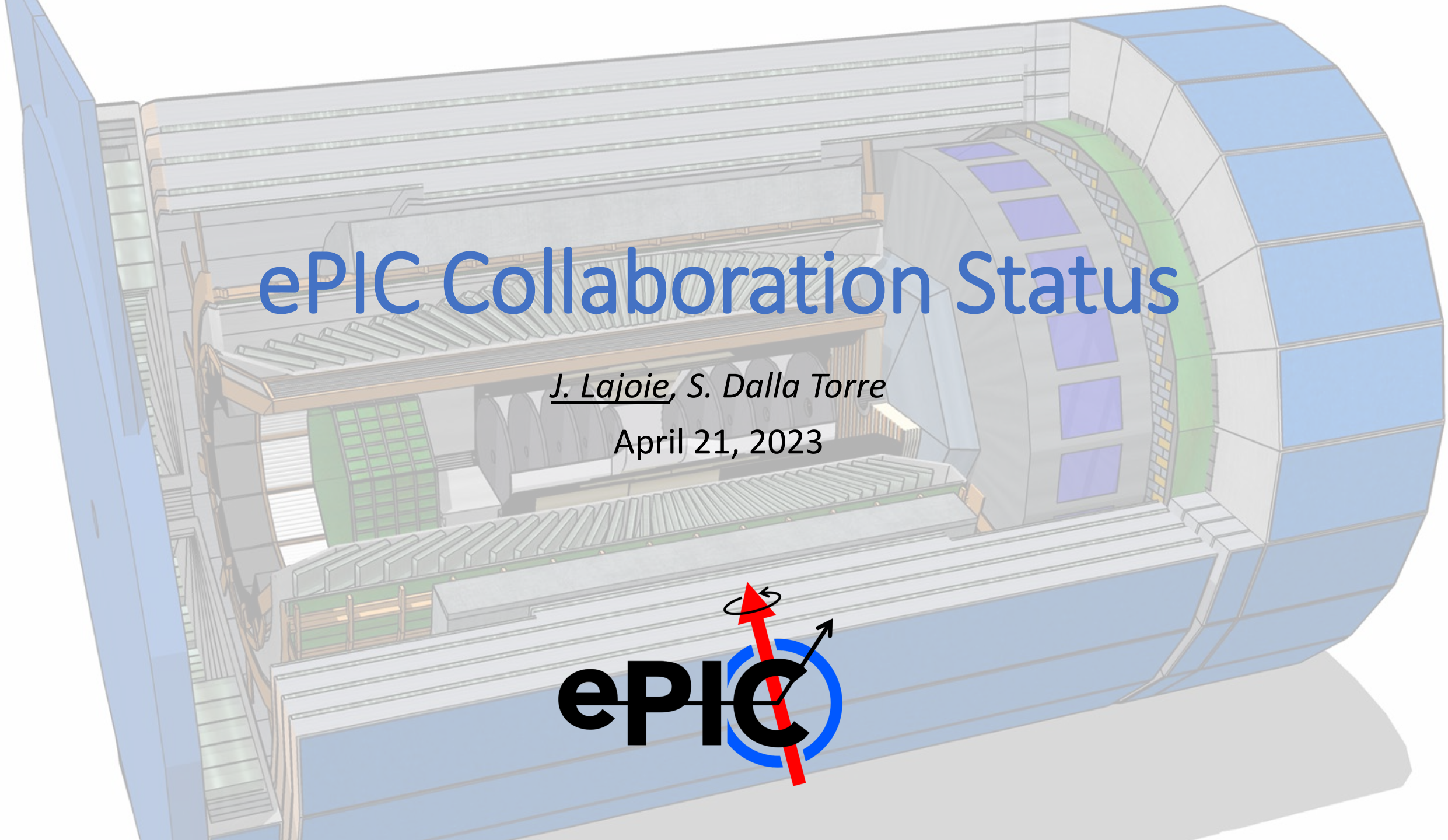

ePIC Collaboration Status

J. Lajoie, S. Dalla Torre

April 21, 2023

ePIC Collaboration Happenings

- It continues to be a very busy time for ePIC!
  - March 13-14th – BECAL review
  - March 16-18th – EIC-Asia Meeting
  - March 20-21st – Backwards PID review
  - March 24th – Collaboration Council Meeting
  - April 3rd – Management plan ratified by CC
  - Spring Conferences (DIS, HP, GHP23, …)
  - April 3-4th - EIC Resource Review Board
  - April 7th – proto-EB Meeting
  - April 14th – General Meeting
  - April 21st – CC Meeting
  - April 24-25th – Meeting @ CERN

March 2023

Mon	Tue	Wed	Thu	Fri
27	28	1	2	3
09:00 GD/I WG: dRICHlayout; restric 11:30 Detector 1 TOF-PID WG Week 12:00 Exclusive/Diffractive/Tagging 12:00 Inclusive reactions (EPIC) 12:00 Modular Reconstruction	09:00 EPIC Far-Forward Weekly Me 12:00 EIC Project - ePIC Leadership 12:30 EW&BSM - WG meeting 15:00 Jet Reconstruction Meeting	10:00 ePIC pfRICH weekly meeting 11:00 ePIC Computing & Software \ 12:30 EPIC calorimetry weekly mee	09:00 EPIC DAQ WG meeting 09:55 ePIC Track reconstruction me 10:00 Far Backward weekly meetin 13:00 Clustering Task Force Meetin +2 more	08:30 EIC Project Detector - Cheren 10:30 Management Plan Discussior
6	7	8	9	10
09:00 GD/I WG: bRICH Validation 10:00 EICrecon Task Force 11:00 EICROC ASIC evaluation for E 12:00 Modular Reconstruction	09:00 EPIC Far-Forward Weekly Me 12:00 EIC Project - ePIC Leadership 13:00 Background Taskforce Meeti 14:00 ePIC Tutorial Series 2: Analyz	08:00 EEEMCAL and barrel homoge 10:00 ePIC pfRICH weekly meeting 12:30 EPIC calorimetry weekly mee	09:00 EPIC DAQ WG meeting 10:00 Far Backward weekly meetin 10:00 ePIC Track reconstruction me 11:00 ePIC Tracking Working Group +3 more	08:00 ePIC Tutorial Series 2: Analyz
13	14	15	16	17
08:00 March 20-21 review pfRICH talks rehearsal 08:00 dRICH Simulation Meeting - M 10:00 Barrel ECAL Review 11:30 Detector 1 TOF-PID WG Week	08:30 SIDIS WG meeting 12:30 EW&BSM - WG meeting +3 more	08:00 ePIC Tutorial Series 2: Runnir 11:00 ePIC Software & Computing \ 12:30 EPIC calorimetry weekly mee	08:00 March 20-21 review pfRICH talks rehearsal 09:00 EPIC DAQ WG meeting 10:00 Far Backward weekly meetin 10:30 ePIC Track reconstruction me +2 more	08:30 EIC Project Detector - Cheren
20	21	22	23	24
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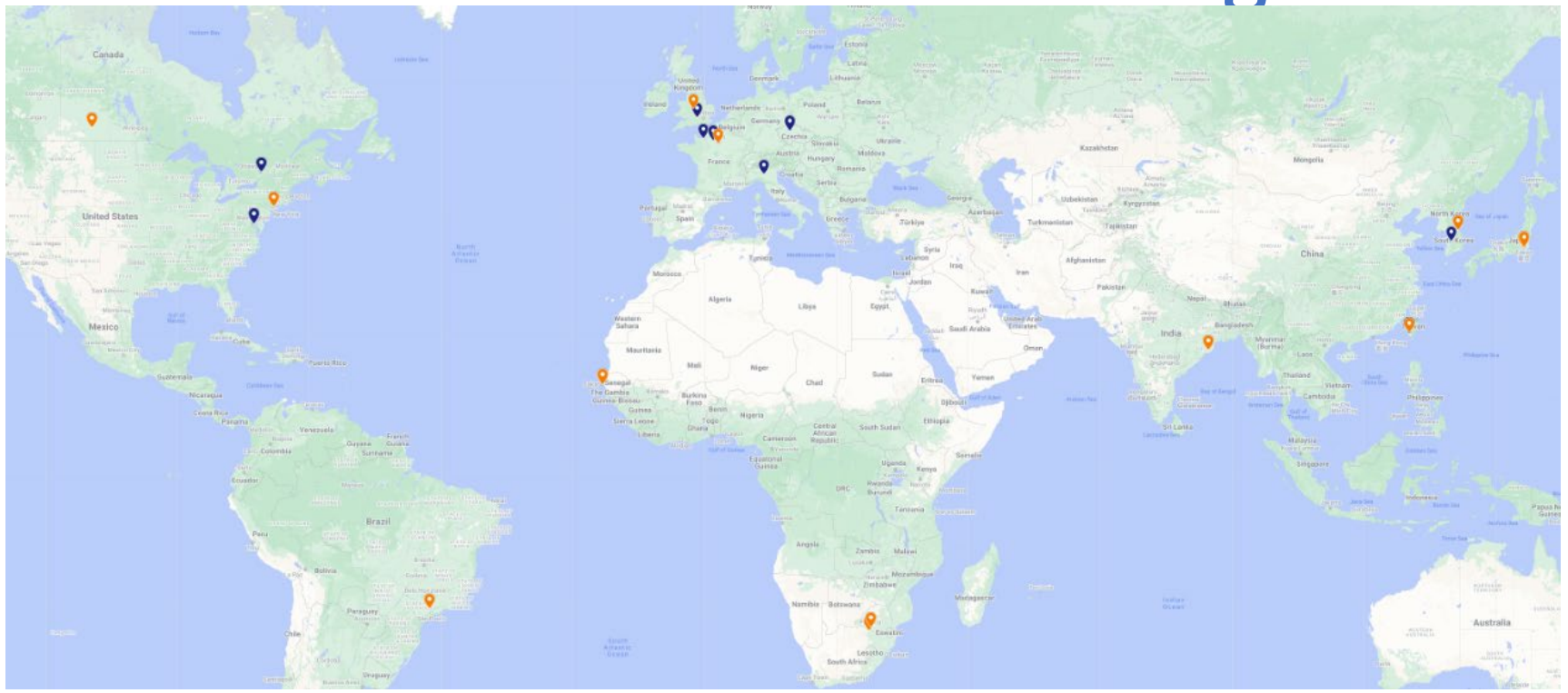
April 2023

Mon	Tue	Wed	Thu	Fri
27	28	29	30	31
09:00 GDI Convener Meeting (non-pu 11:30 Detector 1 TOF-PID WG Week 14:00 Software & Computing Coordi	12:00 EIC Project - ePIC Leadership 12:00 EW&BSM - WG meeting 13:00 eA Study Group Meeting 15:00 Jet Reconstruction Meeting	08:00 EEEMCAL and barrel homoger 11:00 ePIC Software & Computing W	09:00 EPIC DAQ WG meeting 10:00 Far Backward weekly meeting 10:00 ePIC Track reconstruction me 14:00 [CANCELED] Simulation Produ	08:00 GDI Convener Meeting (non-pu 10:30 ePIC Analysis Coordination Ki 15:30 Coordinator Meeting
3	4	5	6	7
11:30 Detector 1 TOF-PID WG Week 12:00 Modular Reconstruction 14:00 Software & Computing Coordi	09:00 EPIC Far-Forward Weekly Mee 13:00 eA Study Group Meeting	08:00 dRICH Simulation Meeting - C 08:00 dRICH meeting 10:00 ePIC pfRICH weekly meeting 12:30 EPIC calorimetry weekly meet	09:00 EPIC DAQ WG meeting 10:00 ePIC Track reconstruction me 11:00 ePIC Tracking Working Group 11:00 TOF Engineering 14:00 Simulation Production Task Fo	13:00 Coordinator Meeting
10	11	12	13	14
14:00 Software & Computing Coordi	09:00 Detector 1 TOF-PID WG Week 09:00 EPIC Far-Forward Weekly Mee 10:00 Far Backward weekly meeting 10:30 GDI->TIC handoff meeting (no +3 more	09:00 dRICH Simulation Meeting - C 10:00 ePIC pfRICH weekly meeting 11:00 ePIC Software & Computing W	10:00 ePIC Track reconstruction me 11:00 ePIC Tracking Working Group 14:00 [CANCELED] Simulation Produ	10:30 ePIC General Meeting 13:00 Coordinator Meeting

ePIC Internal Review Process

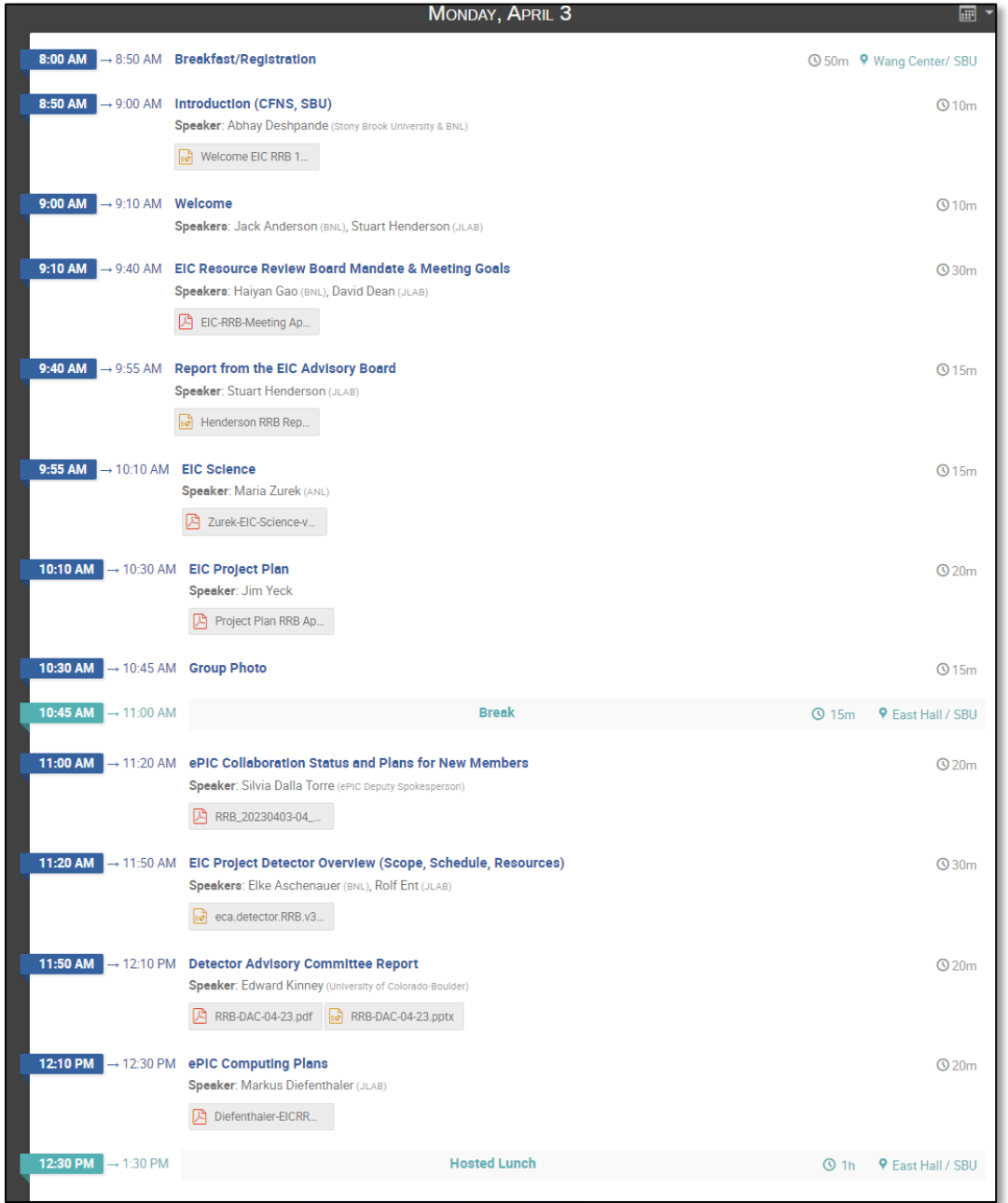
- March 13, 2022 – EIC Project encourages proto-collaboration to *"… integrate new experimental concepts and technologies that improve physics capabilities without introducing inappropriate risk*."
- Spring/Summer 2022 – Barrel ECal and backwards PID identified by GD/I as consolidation items requiring additional scrutiny.
- October '22 – March '23:
  - First ePIC simulation campaign with two geometry concepts (Arches and Bryce Canyon) to support simulation studies for competing technologies
  - Barrel ECal and backwards PID guidance to proponents, committee charge developed.
  - External review committee members identified.
  - GD/I review preparation meetings:
    - (ECal) https://indico.bnl.gov/event/17940/
    - (bRICH) https://indico.bnl.gov/event/18140/, https://indico.bnl.gov/event/18221/
- Proto-EB Meeting April 7th, 2023
- Recommendations announced at General Meeting April 14th, 2023

1st EIC Resource Review Board Meeting



- First meeting on April 3-4, 2023 at Stony Brook University.
- DOE and the host labs are promoting the EIC as a facility that is “fully international in character.”
- 12 countries participating: Blue markers: RRB members; Orange markers: Observers
- Agenda reflects what we expect to have in future RRB meetings.
- RRB Charter was ratified at 1st meeting. Initial Co-Chairs are Haiyan Gao (BNL) and Diego Bettoni (INFN).

1st EIC Resource Review Board Meeting



Monday, April 3

8:00 AM → 8:50 AM **Breakfast/Registration** — 50m — Wang Center/ SBU

8:50 AM → 9:00 AM **Introduction (CFNS, SBU)** — 10m
Speaker: Abhay Deshpande (Stony Brook University & BNL)
Welcome EIC RRB 1...

9:00 AM → 9:10 AM **Welcome** — 10m
Speakers: Jack Anderson (BNL), Stuart Henderson (JLAB)

9:10 AM → 9:40 AM **EIC Resource Review Board Mandate & Meeting Goals** — 30m
Speakers: Haiyan Gao (BNL), David Dean (JLAB)
EIC-RRB-Meeting Ap...

9:40 AM → 9:55 AM **Report from the EIC Advisory Board** — 15m
Speaker: Stuart Henderson (JLAB)
Henderson RRB Rep...

9:55 AM → 10:10 AM **EIC Science** — 15m
Speaker: Maria Zurek (ANL)
Zurek-EIC-Science-v...

10:10 AM → 10:30 AM **EIC Project Plan** — 20m
Speaker: Jim Yeck
Project Plan RRB Ap...

10:30 AM → 10:45 AM **Group Photo** — 15m

10:45 AM → 11:00 AM **Break** — 15m — East Hall / SBU

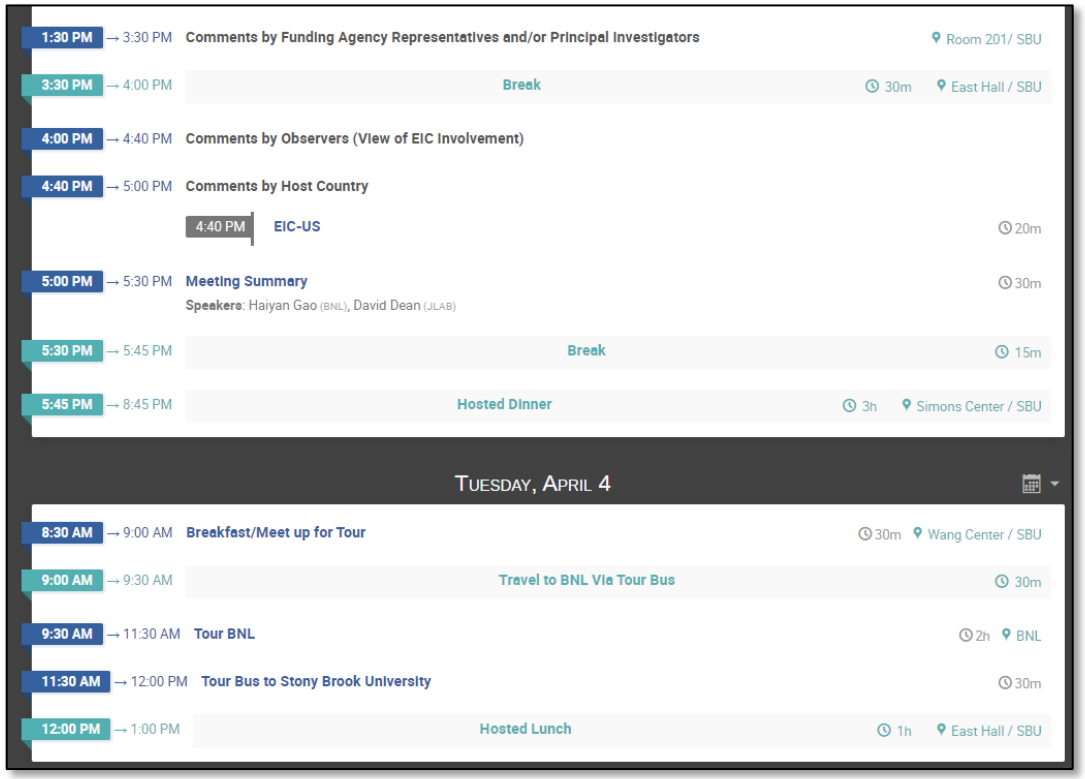
11:00 AM → 11:20 AM **ePIC Collaboration Status and Plans for New Members** — 20m
Speaker: Silvia Dalla Torre (ePIC Deputy Spokesperson)
RRB_20230403-04_...

11:20 AM → 11:50 AM **EIC Project Detector Overview (Scope, Schedule, Resources)** — 30m
Speakers: Elke Aschenauer (BNL), Rolf Ent (JLAB)
eca.detector.RRB.v3...

11:50 AM → 12:10 PM **Detector Advisory Committee Report** — 20m
Speaker: Edward Kinney (University of Colorado-Boulder)
RRB-DAC-04-23.pdf
RRB-DAC-04-23.pptx

12:10 PM → 12:30 PM **ePIC Computing Plans** — 20m
Speaker: Markus Diefenthaler (JLAB)
Diefenthaler-EICRR...

12:30 PM → 1:30 PM **Hosted Lunch** — 1h — East Hall / SBU



1:30 PM → 3:30 PM **Comments by Funding Agency Representatives and/or Principal Investigators** — Room 201/ SBU

3:30 PM → 4:00 PM **Break** — 30m — East Hall / SBU

4:00 PM → 4:40 PM **Comments by Observers (View of EIC Involvement)**

4:40 PM → 5:00 PM **Comments by Host Country**

4:40 PM **EIC-US** — 20m

5:00 PM → 5:30 PM **Meeting Summary** — 30m
Speakers: Haiyan Gao (BNL), David Dean (JLAB)

5:30 PM → 5:45 PM **Break** — 15m

5:45 PM → 8:45 PM **Hosted Dinner** — 3h — Simons Center / SBU

Tuesday, April 4

8:30 AM → 9:00 AM **Breakfast/Meet up for Tour** — 30m — Wang Center / SBU

9:00 AM → 9:30 AM **Travel to BNL Via Tour Bus** — 30m

9:30 AM → 11:30 AM **Tour BNL** — 2h — BNL

11:30 AM → 12:00 PM **Tour Bus to Stony Brook University** — 30m

12:00 PM → 1:00 PM **Hosted Lunch** — 1h — East Hall / SBU

- Next Resource Review Board meeting will be in person in Washington DC
- December 7-8
- Topics will include: Common Fund (or not) discussion, Computing (What is expected from partners), Governance (How does change control work for in-kind contributions), Quality Assurance (how does that get folded in reviews and planning documents), International agreements.

Slide from EIC PM presentation at April 14th General Meeting:

https://indico.bnl.gov/event/18688/

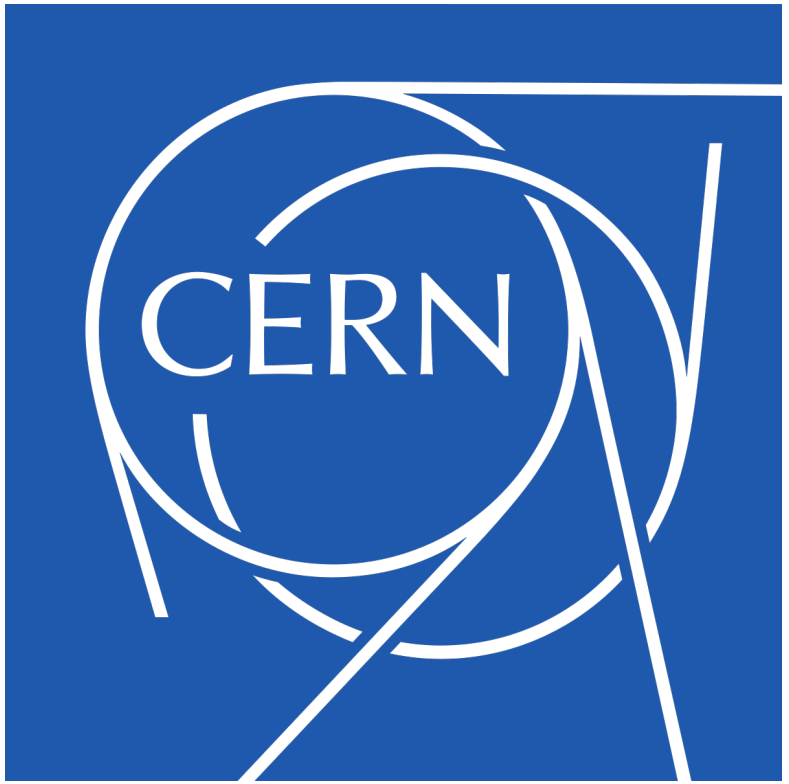
Detector: International Interest & In-Kind

Entity	Interest and Important Facts
NSF	NSF-MSRI pre-proposal submitted by 10 US universities – aims at full scope of backward EM calorimetry (eECal). Armenia, Czech, France/IN2P3 as unfunded contributors. Invited to submit proposal.
Armenia	Contributions, mainly labor to eECal and many EM calorimetry and particle id detectors component tests.
Canada	EIC included in 2022 Canadian Subatomic Physics Long-Range Plan; Interested in Compton Polarimetry, Electromagnetic Calorimetry and Software
China	Forward EM Calorimeter
Czech	Working with funding agency; Interested in eECal (PbWO4 crystals and glass) and Silicon
France/IRFU	Interested in SC magnet design, electronics and MPGD/tracking. Saclay/IRFU provided 30% design work for magnet as in-kind, contributions to 60% and ongoing 90% design.
France/IN2P3	International contribution to backward EM calorimetry (including in-kind design) and to readout electronics (e.g., ASICs for AC-LGAD detectors and Calorimetry). IRFU & IN2P3 discussing together for higher-level contributions.
India	Consortium is working with Funding agency; Interested in detector software (non-project scientific contribution), contributions to DAQ/slow controls, and PID – ToF as hardware (investigating Forward AC-LGAD to make links with Si plants).
Italy/INFN	Working with INFN since a while; Aims at major scope of forward particle identification detector (dRICH), at (part of) the Si/MAPS tracker scope, and at photo-sensor contributions. Further investigating possible interest in EIC detector magnet scope.
Israel	B0 Detectors (Si tracking and PbWO4)
Japan	Interested in a US-Japan agreement; Aims at full scope of Zero-Degree Calorimeter in collaboration with Taiwan/Korea. Pursuit of full scope of barrel AC-LGAD detector as EIC-Asia consortium. Contribution to DAQ/streaming. Possible aerogel.
Korea	Fiber-based EM calorimetry (barrel and/or hadronic ZDC), Small work package for barrel AC-LGAD as part of EIC-Asia consortium (includes also Japan,Taiwan), collaboration on Si tracking detector (backward Si disks), Si-based hadronic calorimetry for ZDC.
Poland	Actively working with ministry/funding agency; Interested in detectors along the beam line (luminosity detector, Roman Pots)
Taiwan	Pursuit of full scope of barrel AC-LGAD as part of EIC-Asia consortium. LYSO-based EM calorimeter for ZDC, Also optical readout/fiber. Possible later interest in PCBs. Computing.
UK	STFC seed funding for UK detector R&D (3M£). Interest in Si/MAPS tracker, polarimetry and detectors along the beams (Low-Q2/TimePix). Follow-up grant request for 5-7 years submitted early 2023 (includes accelerator part).

Meeting @ CERN April 24-25th

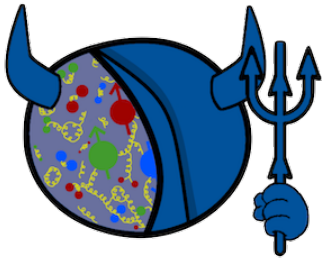
- Discussions on recognized experiment status for ePIC, ITS3 development, cooperation …

- Monday April 24th:
  - Meeting w/Joachim Mnich, CERN Director for Research and Computing
  - EIC-ALICE Meeting
  - Technical discussions
- Tuesday April 25th:
  - Technical discussions
  - CERN-EIC Synergies for Cerenkov PID
    - https://agenda.infn.it/event/35393/



ePIC at Conferences

- DIS 2023, March 27-31st :
  - Invited talks by Richard Milner and Alex Jentsch
  - Seven additional talks by ePIC collaborators
- Hard Probes
  - Invited talk by Friederike Bock
- GHP ’23, April 11-14th :
  - Joerg Reinhold gave a talk on the ePIC Detector and Physics
- Speaking Opportunities:
  - The organizers of SPIN 2023 have contacted us for a speaker to give a plenary talk on ePIC. The conference is Sept. 24-29th at Duke University: https://indico.jlab.org/event/663/
  - PID abstract submitted to HADRON2023 (R. Preghenella)
  - Contact Silvia, Ernst, Bernd or JGL to nominate/self-nominate
- Submit abstracts!



ePIC Calo. Clustering Workshop

- ePIC Clustering Workshop held at ORNL 11-14 April
- Lots of new activity on GitHub associated with this event!

- Apparently, they also had a practical application of safety principles…
- Summary at Calo WG Meeting:
  - https://indico.bnl.gov/event/19173/
- Similar activities encouraged!

Second Simulation Campaign .. Coming Soon!

- Huge improvements over the first campaign:
  - Improved detector geometry and readout information.
  - Many improvements in reconstruction framework, including PODIO integration in JANA2 and EICrecon.
  - Many improvements in the reconstruction algorithms thanks to the TF's on calorimeter clustering, PID, tracking, and jet reconstruction.
  - Background modeling and embedding started thanks to the background TF.

- Planning underway:
  - Critical integration issues to be addressed will be discussed and prioritized by the TC via the TIC (first meeting April 28th) to support CD-3A and the TDR. Coordinators will organize activity needed to support these goals.

Conclusions

- ePIC remains as vibrant as ever, and activity within the collaboration is increasing:
  - Completing the consolidation process with the BECal and backwards PID reviews is a real milestone for the collaboration!
  - Great ePIC talks at spring conferences!
  - Progress on growing the collaboration (EIC-Asia, EIC RRB meeting, …)
  - Substantial progress on reconstruction and simulation software in preparation for the second simulation campaign
    - No time to say more, go to the Software and Computing meetings!
- SP Office is working to stand up the new collaboration structure and start the important work of evolving the ePIC technical design
- Occasionally, fun is spontaneously breaking out!


BACK UP

Barrel ECal Committee Charge

Review Committee was GD/I (Richard Milner excused himself) with external reviewers. Sasha Bazilevsky present as observer (L3 CAM).

Many thanks to our external reviewers:

Etiennette Auffray (CERN)
Tom LeCompte (SLAC)
Rainer Novotny (Univ. Giessen)

https://indico.bnl.gov/event/18517/

ePIC Barrel ECAL Technology Review

Charge to the Committee

The scope of this review is to gather information and feedback on the anticipated performance, cost and risk of two proposed technology choices (scintillating glass and imaging calorimeter) for the ePIC barrel electromagnetic calorimetry system. This review should include both the detector itself and the required readout and digitization electronics.

It is understood that both technology choices are currently evolving from advanced conceptual designs to full technical designs and should be evaluated with this level of development in mind. For the ePIC Barrel ECAL Technology Review, you are asked to address the following questions for each of the two technology options:

1. Is the anticipated performance, as demonstrated by simulations, test beam, R&D, etc. realistic given existing experience? Is the anticipated performance adequate to address the full EIC science program, as outlined in the National Academy (link) report and the EICUG Yellow Report (link)?
2. Are the plans for the detector front-end electronics realistic and well-matched to the sensor properties? Is the detector readout compatible with a streaming readout DAQ, as planned for ePIC?
3. Does the mechanical integration of the detector present any unique challenges?
4. Is there an adequate workforce to build, commission and maintain the detector, or are there adequate plans to evolve the workforce towards these goals?
5. Is the cost and schedule presented realistic? Are the production capabilities of vendors fully understood and consistent with the schedule?
6. Have the proponents adequately identified technical, cost and schedule risks? Are appropriate risk mitigations identified?

Please address the above questions point-by-point.

Backwards PID Committee Charge

Review Committee was GD/I (Silvia Dalla Torre and Thomas Ullrich excused themselves) with external reviewers. Beni Zihlmann present as an observer (L3 CAM).

Many thanks to our external reviewers:

Ichiro Adachi (KEK)
Roberta Cardinale (U. Genova)
Carmelo D'Ambrosio (CERN)
Antonello Di Mauro (CERN)

https://indico.bnl.gov/event/18499/

ePIC Backwards PID Technology Review

Charge to the Committee

The scope of this review is to gather information and feedback on the anticipated performance, cost and risk of two proposed technology choices (the modular RICH and proximity-focused RICH) for the ePIC backwards particle identification system. This review should focus primarily on the detector performance and integration issues.

It is understood that both technology choices are currently evolving from advanced conceptual designs to full technical designs and should be evaluated with this level of development in mind. For the ePIC Backwards PID Technology Review, you are asked to address the following questions for each of the two technology options:

1. Is the anticipated performance, as demonstrated by simulations, test beam, R&D, etc. realistic given existing experience? Is the anticipated performance adequate to address the full EIC science program, as outlined in the National Academy (link) report and the EICUG Yellow Report (link)?
2. Does the mechanical integration of the detector present any unique challenges?
3. Is there an adequate workforce to build, commission and maintain the detector, or are there adequate plans to evolve the workforce towards these goals?
4. Is the cost and schedule presented realistic? Are the production capabilities of vendors fully understood and consistent with the schedule?
5. Have the proponents adequately identified technical, cost and schedule risks? Are appropriate risk mitigations identified? Please comment on production and performance uncertainties for both the aerogel and the LAPPD's.

Please address the above questions point-by-point.

EB Meeting 4/7/2023

- As discussed at the CC Meeting on 3/31, the Spokesperson's Office convened a meeting of the Executive Board:
  - EB discussion of recommendations for technology selections for BEMCal and backwards particle ID needed
  - Included temporary members pending election of CC – elected members

- First meeting of ePIC Executive Board:
  - **Members:** J. Lajoie, S. Dalla Torre, K. Dehmelt, M. Diefenthaler, R. Reed, S. Fazio
  - **CC Chair/Vice Chair (invited, non-voting):** E. Sichtermann, B. Surrow
  - **Temporary EB Members:** B. Jacak, O. Evdokimov, T. Gunji, D. Higinbotham
  - **External Input Solicited:** P. Jones, P. Newman