



22–23 Jun 2023
Corigliano-Rossano
Europe/Rome timezone

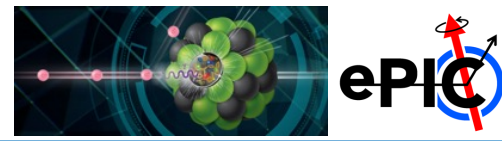
Enter your

Status EIC/ePIC and INFN involvement At a turning point

P. Antonioli
INFN-Bologna



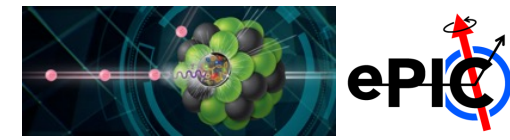
Also 2022/2023 has been a long journey!



What happened since Catania meeting? (30/6 – 1/7 2022)



First two collaboration meetings!



Electron-Ion Collider User Group Meeting - 2022

CFNS, Stony Brook University, July 26 - 29, 2022



Electron-Ion Collider User Group Meeting - 2022

<https://indico.bnl.gov/event/17621/>

Reduced INFN participation (TS BO BA FE) + RN

We got in the mean time a charter and a logo



First EICUG meeting with "inside" the meeting of the Detector 1 collaboration (we decided a name (EPIC), but not yet an elected leadership)

<https://indico.bnl.gov/event/15342/timetable/#20220726>

Large INFN participation (TO FE TS GE BA BO RM2 CT) + RN

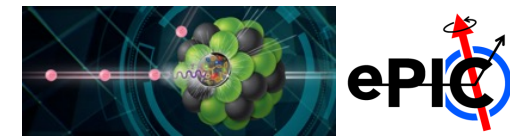
January 2023 ePIC Collaboration Meeting

9 Jan 2023, 08:00 → 11 Jan 2023, 23:40 US/Eastern

Description



A lot of work and adjustments "in transition"



(July 2022 – April 2023)

- Pietro served in the Charter Committee and the Charter was then approved before January. meeting
- we realized a old magnet was not good (August) and we designed a new one...
- working groups decided after ATHENA/ECCE merging operated until March 2023: a special thanks to Roberto (PID), Andrea (Computing), Marco (SIDIS) and Silvia (Steering Committee + Integration)
- we submitted applications for EIC eRD program (by 1st October) with substantive results (known fully in January 2023)
- we performed test beams (October 2022) with encouraging results
- we got an increasing financial support from INFN CSN3 in a difficult budget year
- EICUG has changed its Charter adapting itself to the new phase (that is an experimental Collaboration exists): more on this later
- [see this talk]



but somehow the **big news** is....

ePIC is running!

<https://indico.bnl.gov/category/402/>

EPIC

Enter your se

Collaboration Meetings

Project-Collaboration Management

Tracking

Calorimetry

Far Forward

Far Backward

DAQ / Electronics / Readout

Software and Computing

General Meetings

CerenkovPID

52 events

18 CerenkovPID

2

10

Export

Category

Synchronize with your calendar

You may copy-paste the following URL into your scheduling application. Contents will be automatically synchronised.

<https://indico.bnl.gov/category/402/events.ics>

Download

Download an iCalendar file that you can use in calendaring applications.

dRICH Simulation Meetings

33 events

Working Group Meetings

31 events

pfRICH meetings

24 events

Miscellaneous

1 event

dRICH meetings

8 events

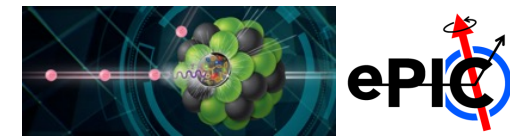
hpDIRC

4 events

Enter your search term



and mailing lists...



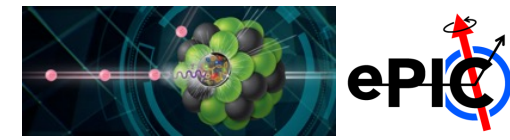
<https://lists.bnl.gov/mailman/listinfo/>

Eic-projdet-collab-l	[EPIC-Collaboration]
Eic-projdet-tracking-l	[EPIC-Tracking-WG]
Eic-projdet-trk-recon-l	[EPIC-TrkRecon]
Eic-projdet-cpid-l	[EPIC-CerPID-WG]
Eic-projdet-daq-l	[EPIC-DAQ-WG]
Eic-projdet-drich-l	ePIC dRICH mailing list
Eic-projdet-earlycareer-l	[EPIC-Early Career]
Eic-projdet-pfrich-l	ePIC pfRICH mailing list
Eic-projdet-pid-l	The ePIC PID detector list
Eic-rd-silicon-l	Mailing list for the EIC silicon R&D consortium

DISCLAIMER:
for sure I forgot some
relevant ePIC mailing lists

for physics working groups → Salvatore's talk

ePIC has a leadership team



ePIC constitution approved last December

Candidates for apical positions presented their programmes / statement of intent at ePIC January meeting



John Lajoie
Iowa State University
ePIC spokesperson



Silvia Dalla Torre
INFN Trieste
ePIC deputy spokesperson



Ernst Sichterman
LBL
ePIC Collaboration Council Chair



Bernd Surrow
Temple University
ePIC Collaboration Council Vice-Chair

(thanks to D. Elia for serving in the Election Committee)

June 2023

23 Jun [ePIC General Meeting](#)

08 Jun [ePIC General Meeting](#)

May 2023

26 May [ePIC General Meeting](#)

11 May [ePIC General Meeting](#)

April 2023

14 Apr [ePIC General Meeting](#)

March 2023

03 Mar [Management Plan Discussion -PWG Reorganization](#)

02 Mar [Management Plan Discussion - DWG/PWG Reorganization](#)

February 2023

24 Feb [Management Plan Discussion - DWG Reorganization](#)

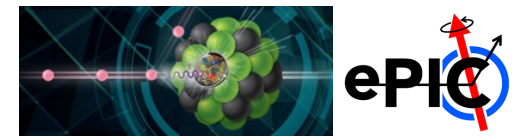
10 Feb [ePIC General Meeting](#)

January 2023

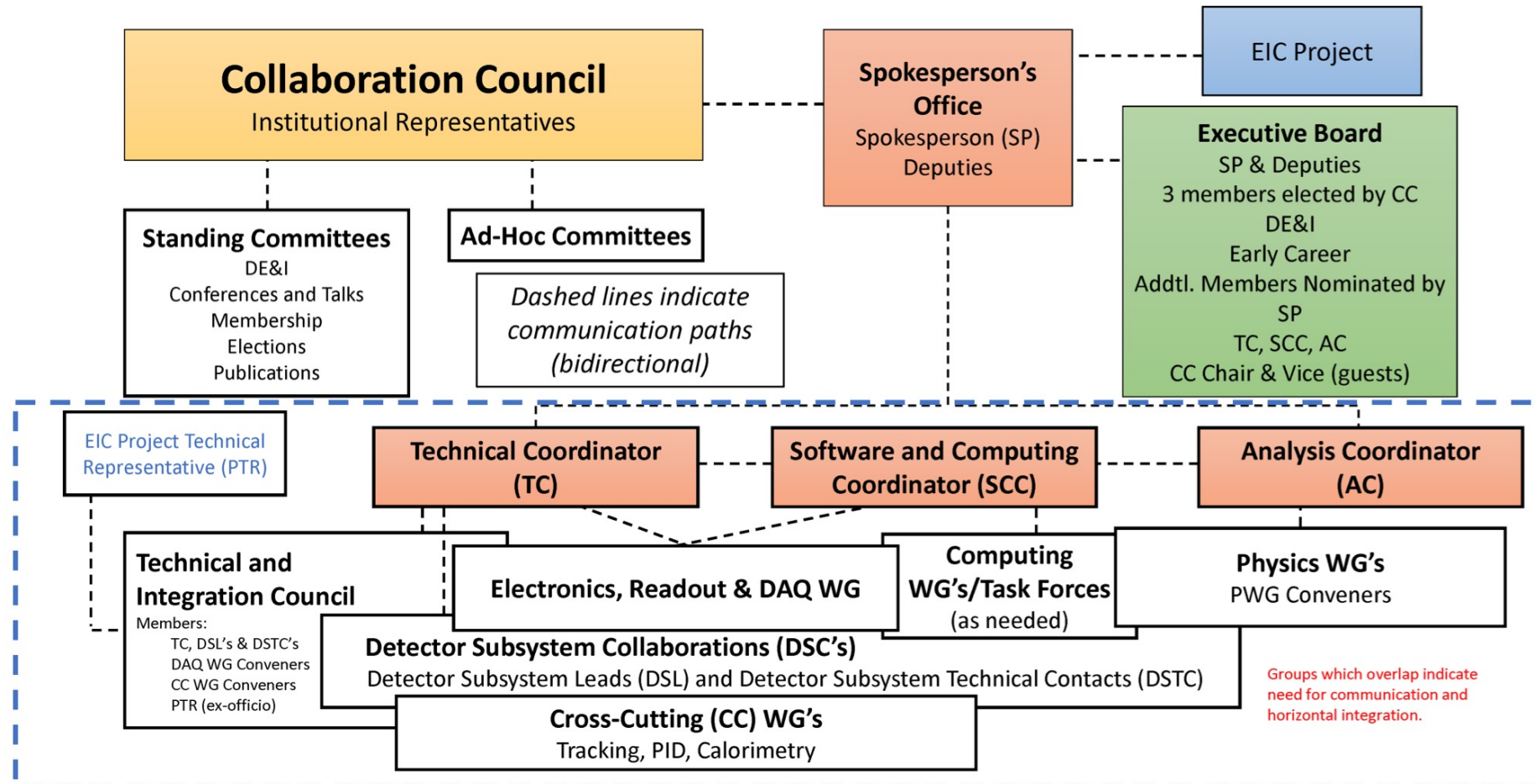
26 Jan [ePIC General Meeting](#)

t

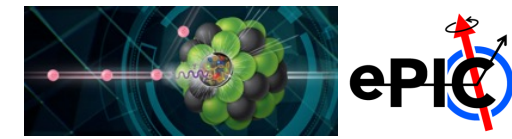
following leadership election
a management plan is being implemented



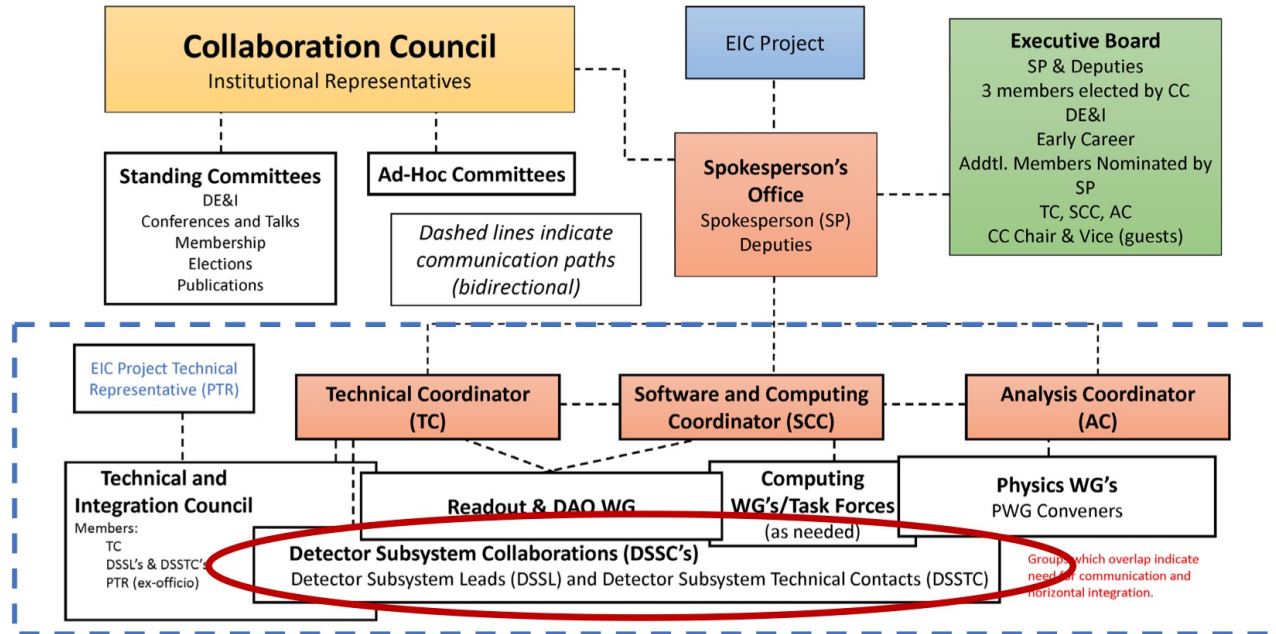
ePIC Collaboration Structure



transition to DSC is a litmus test!



Collaboration Structure Including the Scientific Structure for the Next Two-Year Term

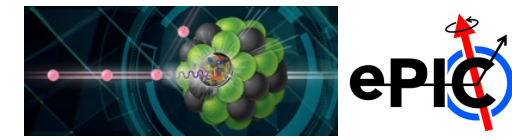


- Need to **evolve DWGs** to a structure more appropriate to the (pre-)TDR/construction phase: **WGs → Detector Subsystems**
- Each project corresponds to a subdetector built by a **Detector Subsystem Collaboration (DSSC)** of the groups and institutions contributing to it
- Each project collaboration will choose its **Detector Subsystem Lead (DSSL)** and **Detector Subsystem Technical Contact (DSSTC)**
- DSSL/DSSTC (Collab.) <-> L4 Tech. Contacts (Project)

The goal is a tight integration between the project and the collaboration at a technical level.

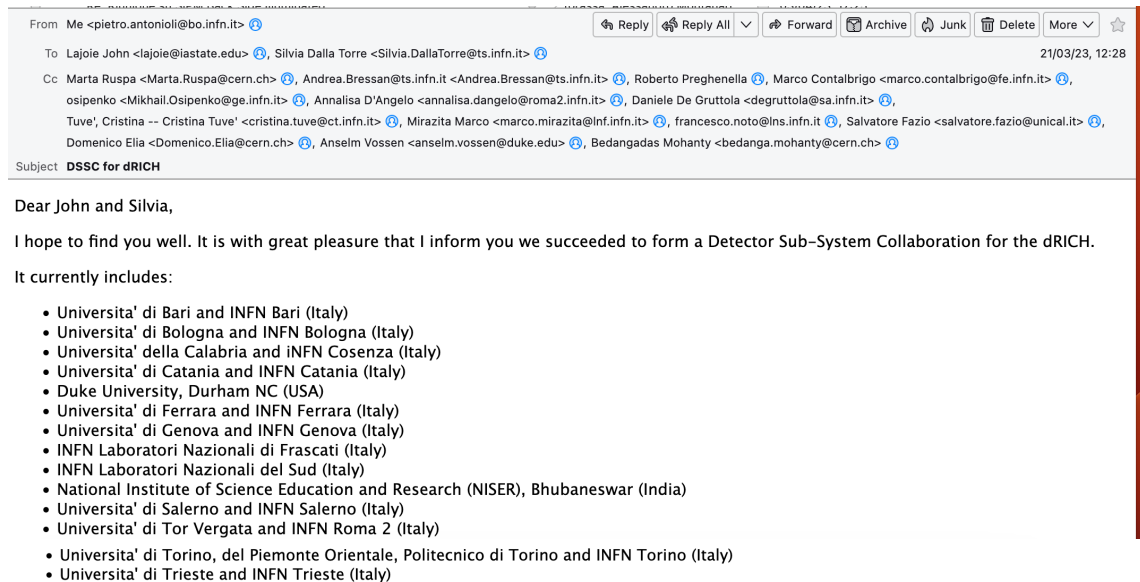
Detector SubSystem Collaboration → the sub-detector "project"

Where we are now?



dRICH team leaders (all INFN + Duke + Niser) indicated **Marco Contalbrigo** as DSL (I acted as facilitator/some how convener in the process) (TO GE TS FE BO BA RM2 CT LNS CS SA are members of dRICH DSC)

EIC Silicon Consortium is morphing in a Silicon Vertex Tracker DSC → **Ernst Sichtermann** as DSL (LBNL) (PD BA TS are members of SVT DSC)



for MPGD tracker (relevant for potential involvement of INFN groups: GE RM2) → **Kondo Gnavno** (Jlab) is DSL

(GE and TS have contributed to pfRICH design but are not being part of pfRICH DSC)

all the group leaders, here cc-copied, support the appointment by the spokesperson Office of Marco Contalbrigo (INFN Ferrara) as DSSL

Few caveats:

– given the tight schedule to form the DSSC (one month since 24th February) we consider this a hopefully not yet completed list. Contacts are in place to possibly reach other institutions. Similarly we "formed a Detector Sub-System Collaboration", but obviously this is again a starting point: we expect to refine internal organization, roles, rules etc.. during coming months under Marco's leadership towards the preparation of the TDR


– given the large number of INFN groups I acted here as a kind of facilitator (and this is why you get this mail from me today and I liaised with non-INFN institutions too, a special thank on my side to Anselm and Bedanga) but since now on we expect of course you will primarily liaise with Marco for dRICH matters. I understand contacts are already in place to step-up dRICH efforts on ePIC collaboration (example: Indico sub-section, meetings, mailing list etc.)

see TIC meeting 28 Apr for first status of DSC formation



dRICH

Compact cost-effective solution for particle identification in the high-energy endcap at EIC

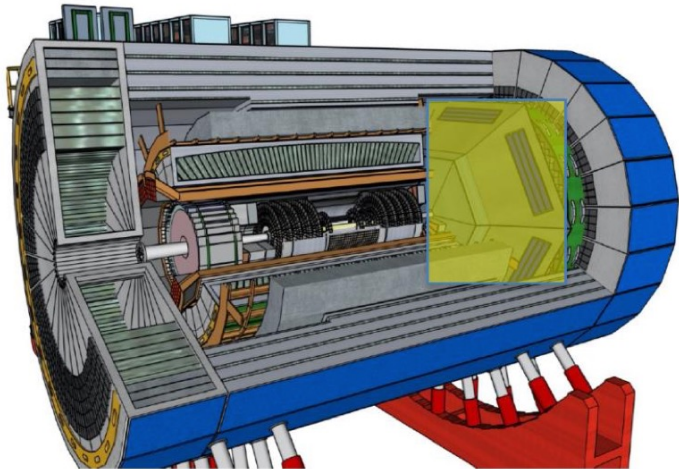
dRICH






BA, BO, CS, CT, FE ,
GE, LNF, LNS, RM2,
SA, TO, TS

EPIC



EIC RICH Consortium

.....

dRICH Collaboration: Board of Istitutional Representatives

DSCL: appointed (acting as TC for the moment)

dRICH Office: Contact Persons of Developing Programs

Simulations, Mechanics, Gas Radiator	↔	Global layout
Photo-detector, Front-end Asics, Data Acquisition	↔	Services
Aerogel Radiators, Mirrors	↔	Internal structure

Restructuring activity under EPIC framework :

New mailing list: Eic-projdet-drich-l

New general meeting series: <https://indico.bnl.gov/category/472>

dRICH meetings

meetings of the dRICH DSC

There are 5 events in the future. [Hide](#)

May 2023

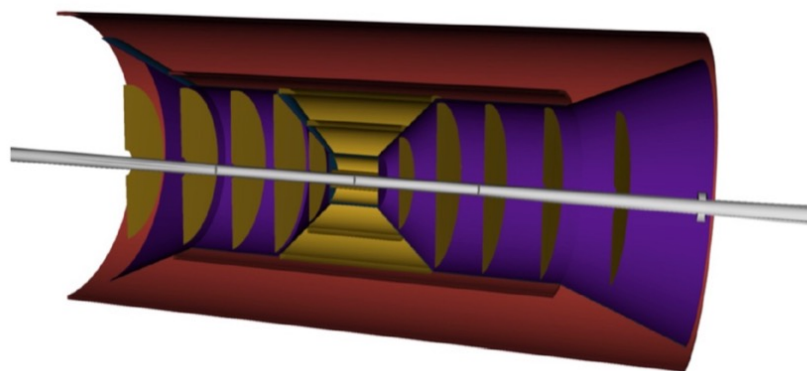
-  31 May [dRICH Meeting - Geometry and Simulations](#) **NEW**
-  24 May [dRICH Meeting - Photo-sensors](#) **NEW**
-  17 May [dRICH Meeting - Radiators and Prototype](#) **NEW**
-  10 May [dRICH Meeting - Mechanics and Mirrors](#) **NEW**
-  03 May [dRICH Meeting - Readout Electronics](#) **NEW**

April 2023

-  26 Apr [dRICH Meeting - Geometry and Simulations](#)

ePIC SVT DSC

The **S**ilicon **V**ertex **T**racker **D**etector **S**ubsystem **C**ollaboration has come together to develop, construct, and operate a well-integrated, large-acceptance, low-mass, high resolution tracking and vertexing solution for ePIC based on Monolithic Active Pixel Sensors (MAPS) in 65 nm technology,



Five barrel layers at radii r_{X_0} and lengths L of

$$r_{0.05\%} = 36, 48, 120 \text{ mm}; L = 270 \text{ mm}$$

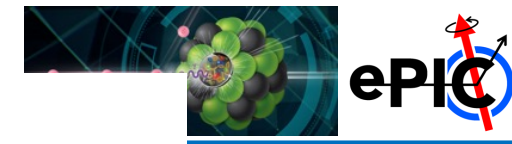
$$r_{0.25\%} = 270 \text{ mm}; L = 540 \text{ mm}$$

$$r_{0.55\%} = 420 \text{ mm}; L = 840 \text{ mm}$$

Extended disk arrays, as space permits, with $X_0 \sim 0.24\%$ per disk

The three inner barrel layers will be constructed from ITS3 wafer-size sensors, while the outer layers and disks will make use of smaller area stitched sensors and more conventional supports.

ePIC SVT DSC (continued)



20

This is a large-scale and challenging effort, requiring multiple areas of R&D

eRD113 – sensor development and characterization

eRD104 – services reduction

eRD111 – modules, mechanics, cooling, and integration

Several institutions are taking part:



and more are joining. SVT DSC is open to and welcoming new collaborators.

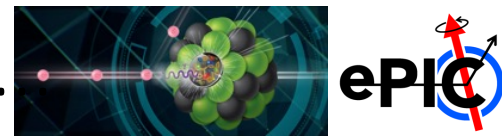
Contacts: Laura Gonnella (Birmingham, DSTC) – laura.gonnella@cern.ch

Ermst Sichtermann (LBNL, DSL) – epsichtermann@lbl.gov

DSC Reps

04/28/2023

A general note about ePIC / responsabile nazionale / DSCs.

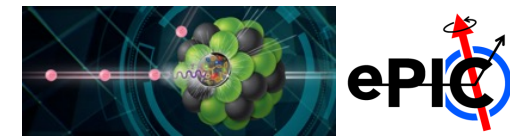


- with DSC being implemented, responsabile nazionale role is step-by-step morphing toward more "normal INFN coordinating role" (at least as I see it!)
- main areas: community building, "support" toward DSC where INFN is involved, liaison with INFN management, "planning officer (preventivi etc)", coordination of DoE funding, RBB, help "physics effort" but no longer coordinating R&D
- (this could be also part of our tomorrow open-mic discussion)

ePIC with DSCs and WG are now our **main** forum for discussion and **space** for actual work (they are not "a plus" in addition to EIC_NET)



Intermezzo: some ePIC big decisions



Recommendation

- The SciGlass EMCal implementation carries substantial risk based on the need for continued R&D to determine the SciGlass characteristics
 - This risk is fundamental to the technology choice and difficult to mitigate if realized.
- The Imaging EMCal with four imaging layers meets or exceeds the performance requirements
 - The detector can be built to accommodate additional AstroPix layers as a potential upgrade
- **Recommendation:** ePIC should initiate the EIC change control process to make the Imaging Barrel EMCal with four imaging layers the baseline technology selection. The design should be upgradeable to six layers as a future (off-project) upgrade.
- This recommendation was unanimously endorsed by the Executive Board.

Italian groups (GE-TS) involved in the pfRICH effort at the design level

See <https://indico.bnl.gov/event/18688/>
14th April ePIC general meeting for barrel EMCal and backward RICH key recommendations

A traditional "hook" for streaming readout (eRD105) effort is going to disappear

Recommendation

- The mRICH design carries a larger unknown, given that it is the **first use of a design with Fresnel lenses** in a large experiment (a substantial risk underlined in the report of the review panel).
- The backward RICH design is envisioned to be compatible with LAPPD photosensor readout to fulfill the desired double particle identification and timing purpose.
- The **peak QE value** assumed by the mRICH is at variance with respect to the response of LAPPD's/HRPPD's manufactured by Incom. This would imply additional R&D that may be lengthy.
- The **uncertainty associated with the photodetector HRPPD** is the most critical issue in both designs. The risk mitigation in both cases involves the use of MCP-PMT's, which are substantially more expensive. The use of Si-PM's is not an option as it will not fulfill the requirement to provide timing information.
 - For the mRICH, the instrumented area is fixed. If risk mitigation for the HRPPD's is required the only option to reduce the cost associated with the MCP-PMT's cost will be to reduce acceptance.
 - The pfRICH has the capability to reduce the instrumented area without reducing acceptance by changing the inclination of the mirrors. This offers substantial additional flexibility if the risk associated with HRPPD's is realized.
- The **estimated cost** for the two design **is the same** within the present resolution and fully compatible with the Project P6 envelope (mRICH with SiPMs).

Recommendation: mRICH and pfRICH costs are nearly the same, but pfRICH carries a lower risk, thus ePIC should initiate the change control process to make the pfRICH the baseline technology selection for the backward RICH.

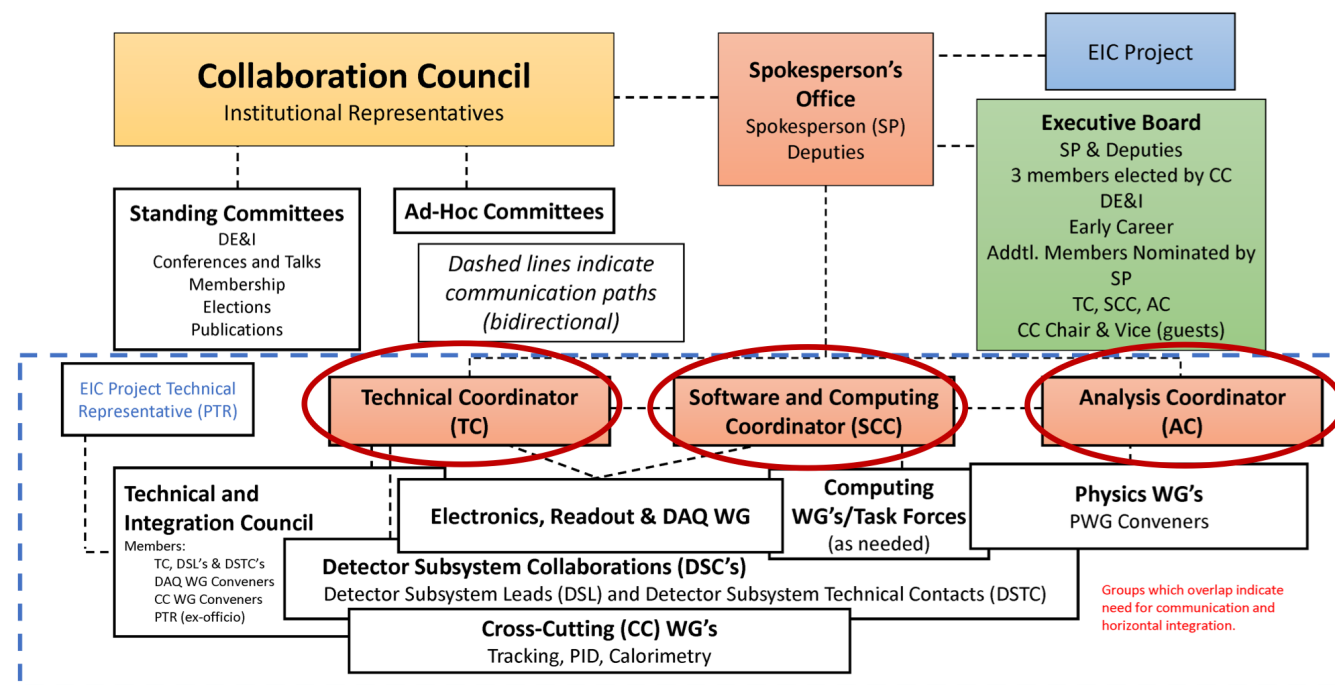
The recommendation of the pfRICH design for the ePIC backwards PID detector has the unanimous support of the Executive Board.

- ePIC Marches On...

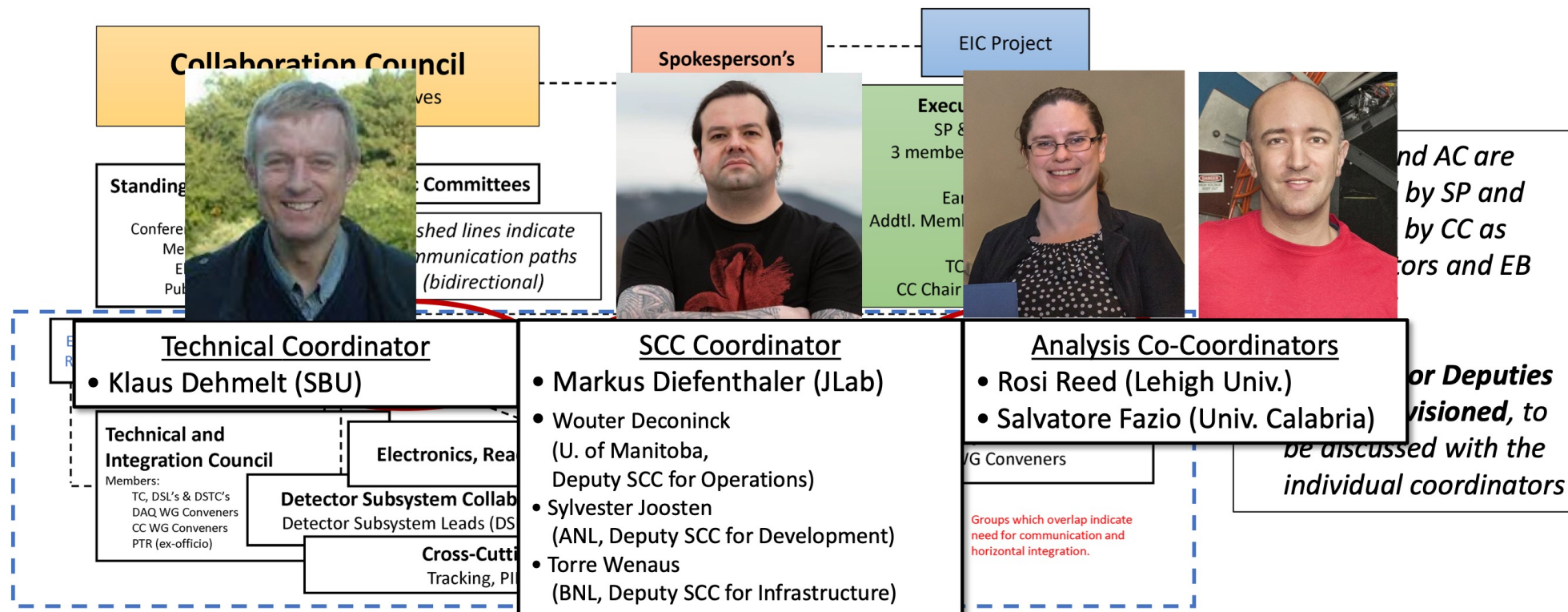
- April 21st – CC Meeting
- April 24-25th – SP + PM Meetings @ CERN

- Recognized Expt. Status
- ALICE-ITS3*
- PID R&D Meeting
- May 2nd – Results of CC vote:
 - Endorsed motion to initiate change control for pFICH, Imaging EMCal
 - Working group structure endorsed
 - Convenor nominations endorsed

ePIC Collaboration Structure



ePIC Collaboration Structure



With the Deputy Spokesperson and one of the Analysis Coordinators we are in an optimal position!

- prepare the future!
- see talks from Salvatore (today) and Andrea (tomorrow)
- Klaus is unfortunately leaving already

Software and Computing

Operations WGs:

Production

- Responsible for the coordination and production of simulation campaigns based on priorities from the TC and AC's. Develop automated production workflows that scale with the needs of the collaboration.
- [Sakib Rahman \(Manitoba\)](#)
- [Thomas Britton \(JLab\)](#)

User Learning

- Responsible for support via documentation, help desk, and training. Ensure that software is discoverable (easy to use with only minimal instructions) and simulated data and metadata is findable.
- [Holly Szumila-Vance \(JLab\)](#)
- [Kolja Kauder* \(BNL\)](#)

Validation

- Responsible for the validation of the simulations via a suite of detector and physics performance plots. Develop autonomous checks and verification of the validation plots.
- [Torri Jeske \(JLab\)](#)
- [Dmitry Kalinkin \(Kentucky\)](#)

Development WGs:

Physics and Detector Simulation

- Development of accurate MC simulations using a suite of physics and background generators and detector simulation based on Geant4 and DD4hep.
- [Kolja Kauder* \(BNL\)](#)
- [Chao Peng \(ANL\)](#)

Reconstruction

- Development of a holistic and modular reconstruction for the integrated ePIC detector.
- [Shujie Li \(LBNL\)](#)
- [Derek Anderson \(ISU\)](#)

Analysis Tools

- Integration of analysis methods and tools in central software and computing workflows.
- [Zhoudunming \(Kong\) Tu \(BNL\)](#)
- TBD

Infrastructure WGs:

Streaming Computing Model

- Development of the computing model for the compute-detector integration using streaming readout, AI/ML, and multi-architecture computing (CPU, GPU, ...) with a specific focus on the data flows after the FEE layer.
- [Marco Battaglieri \(INFN Genova\)](#)
- [Jin Huang \(BNL\)](#)



Cross-Cutting Working Groups

*Kolja Kauder is 10x

ePIC CC Meeting

Physics WG → see Salvatore's talk

Electronics, Readout and DAQ

- Oversee development of readout and DAQ from front end to storage.
- [Fernando Barbosa \(JLab\)](#), [Jeff Landgraf \(BNL\)](#), [Jin Huang \(BNL\)*](#)
 - One each with analog electronics, digital electronics, and streaming readout emphasis
 - *Streaming Readout convenor shared with Streaming Computing Model WG under SCC

Tracking WG

- Design and performance of an integrated tracking system for ePIC
- [Ernst Sichtermann \(LBNL\)](#), [Matt Posik \(Temple\)](#)

Calorimetry WG

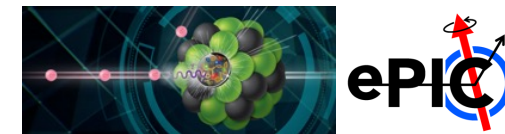
- Address common concerns of calorimetry in ePIC
- [Oleg Tsai \(UCLA\)](#)

PID WG (TOF and Cerenkov)

- Development of an integrated PID system for ePIC
- [Oskar Hartbrich \(ORNL\)](#), [Thomas Ullrich \(BNL\)](#)

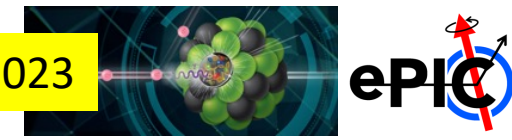
FFWD/FBKWD

- Development of integrated FFWD/FBKWD systems for ePIC
- [Simon Gardner \(Glasgow\)](#)
- [Nathaly Santiesteban \(UNH\)](#)



First EIC Resource Review Board

3-4 April 2023



<https://indico.bnl.gov/event/18452/>

For INFN attended by Diego Bettoni (vice-president) + Rosario Nania (CSN3 chair) + Pietro Antonioli

Silvia also attending (as ePIC DS)

Next RRB in December

MONDAY, 3 APRIL

08:00 → 08:50 **Breakfast/Registration** 50m Wang Center/ SBU

08:50 → 09:00 **Introduction (CFNS, SBU)** 10m
Speaker: Abhay Deshpande (Stony Brook University & BNL)
Welcome EIC RRB 1....

09:00 → 09:10 **Welcome**
Speakers: Jack Anderson (BNL), Stuart Henderson (JLAB)

09:10 → 09:40 **EIC Resource Review Board Mandate & Meeting Goals**
Speakers: Haiyan Gao (BNL), David Dean (JLAB)
EIC-RRB-Meeting Apr...

09:40 → 09:55 **Report from the EIC Advisory Board**
Speaker: Stuart Henderson (JLAB)
Henderson RRB Rep...

09:55 → 10:10 **EIC Science**
Speaker: Maria Zurek (ANL)
Zurek-EIC-Science-v4...

10:10 → 10:30 **EIC Project Plan**
Speaker: Jim Yeck
Project Plan RRB Apr...

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

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

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

12:10 → 12:30 **ePIC Computing Plans**
Speaker: Markus Diefenthaler (JLAB)
Diefenthaler-EICRRB-...

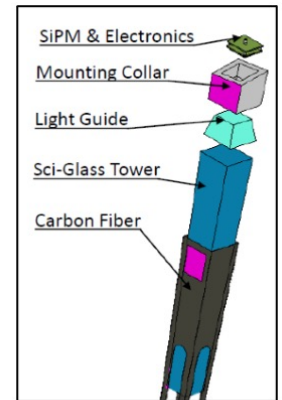
Before RRB I was requested to give an update talk to Consiglio Direttivo on Thu 29 March

<https://indico.bnl.gov/event/18452/>

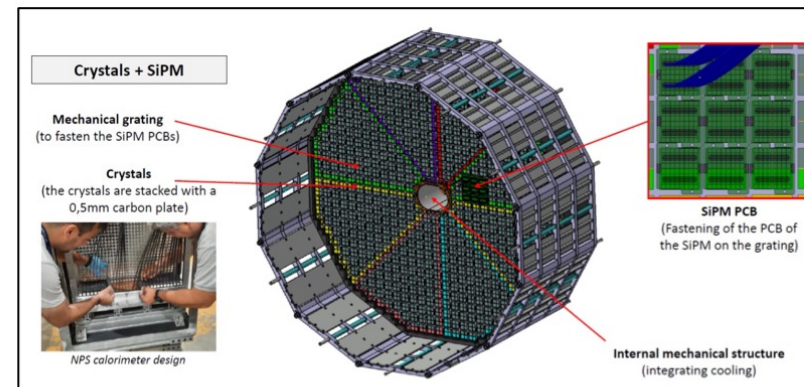
Detector E&D Progress – In-Kind User Contributions

Much engineering and design progress courtesy in-kind contributions!

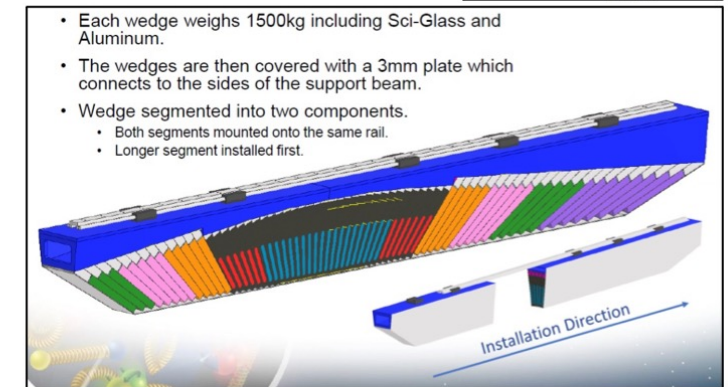
- ❑ Example I: Backward EM Calorimeter: France/IJCLab
- ❑ Example II: Barrel EM Calorimeter: US universities (CUA, MIT)
- ❑ Example III: dRICH: INFN institutions
- ❑ Example IV: Si vertex tracker design: UK/STFC
- ❑ Example V: Barrel MicroMegas MPGD: France/CEA-Saclay
- ❑ Example VI: Magnet E&D contribution: France/CEA-Saclay



Barrel (SciGlass) EM Calorimeter design



Backward EM Calorimeter design



Pre-CD-2 baseline contributions to the detector PED from in-kind are estimated to be around \$5M

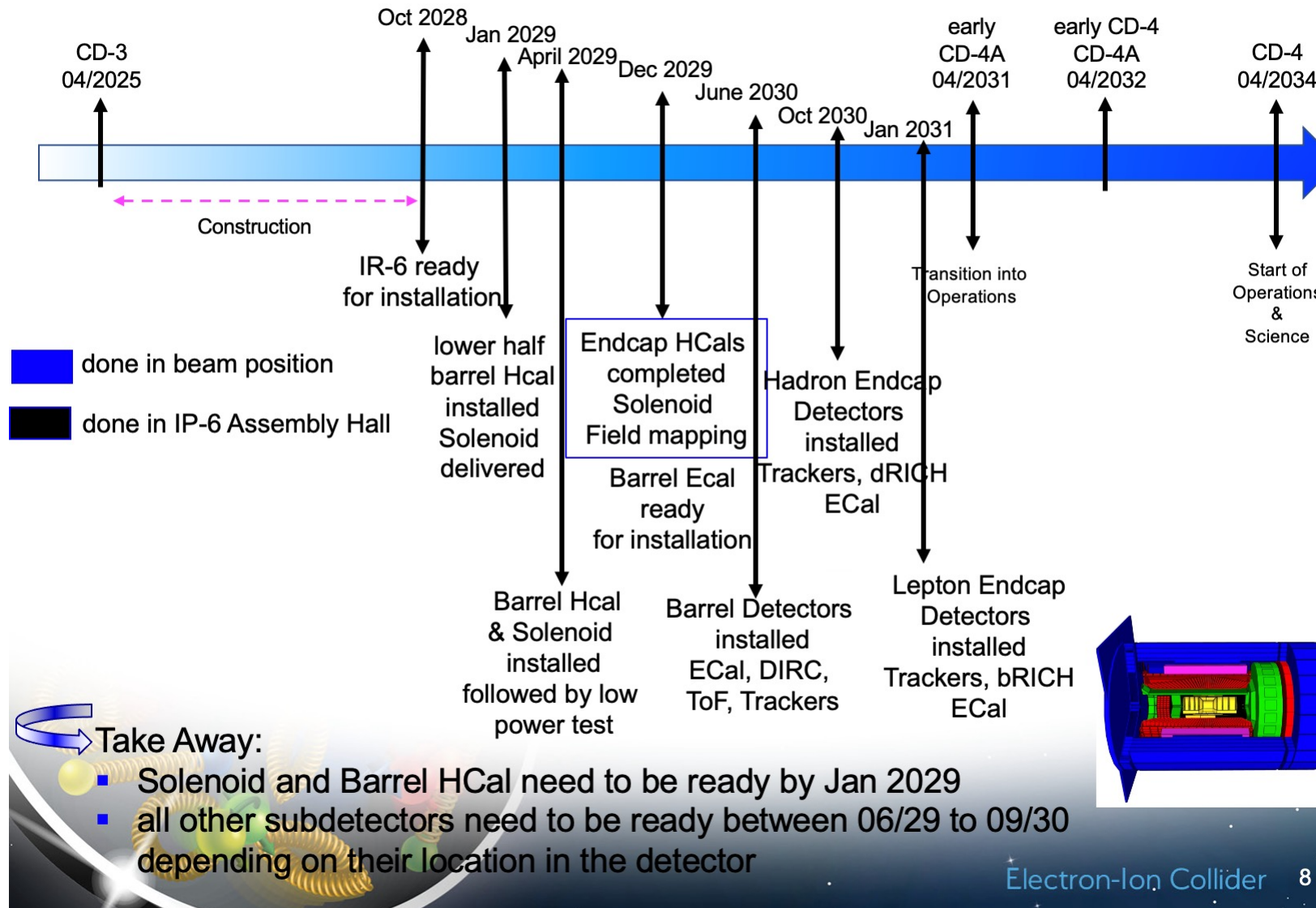
<https://indico.bnl.gov/event/18452/>

International Interest & In-Kind - Updated

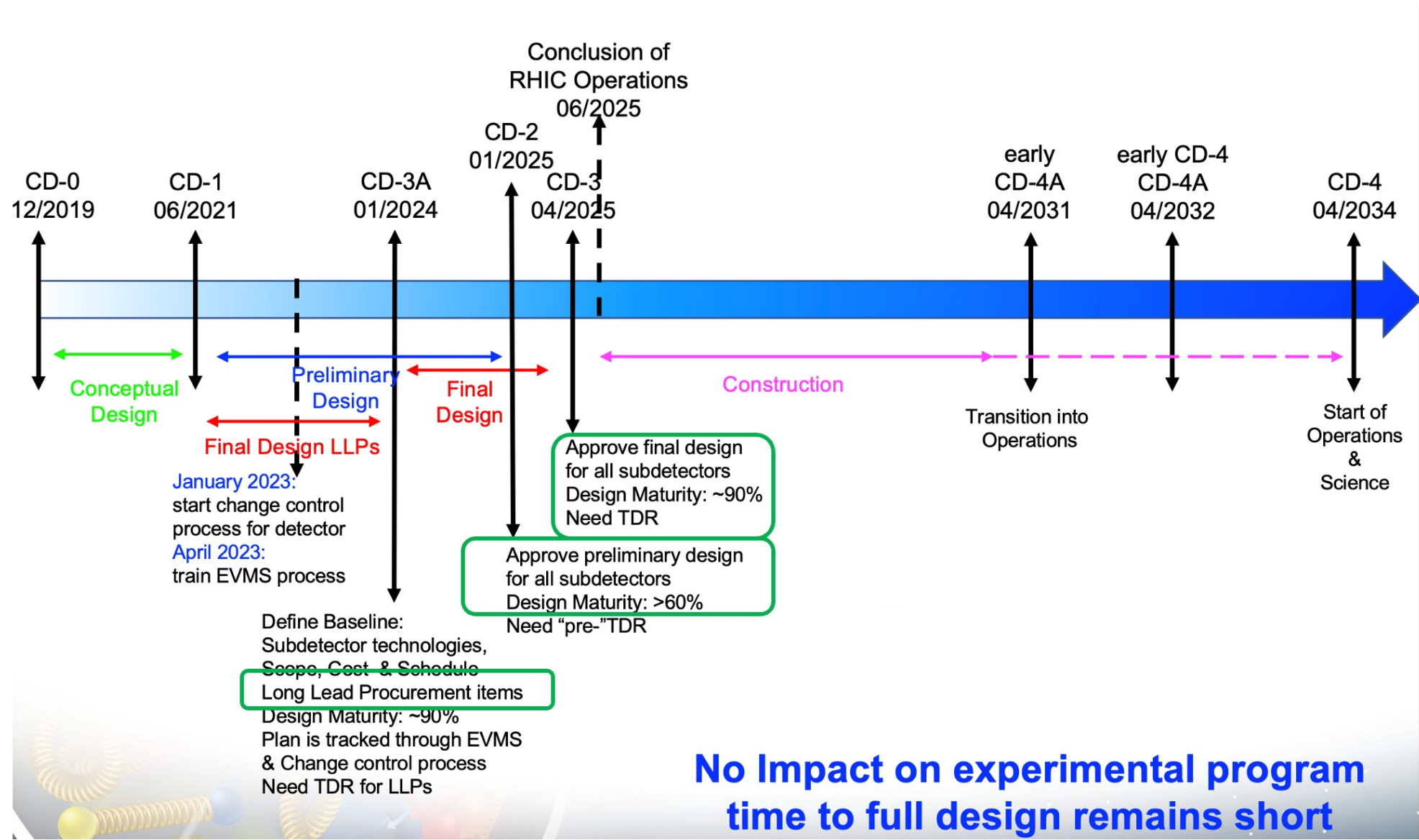
Entity	Interest and Important Facts
NSF	NSF-MSRI pre-proposal submitted by 10 US universities – aims at full scope of backward EM calorimetry (eECal). Armenia, Czech, France/IN2P3 as unfunded contributors. Invited to submit proposal.
Armenia	Contributions, mainly labor to eECal and many EM calorimetry 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).

20

High Level Installation Schedule



EIC/ePIC timeline: 7 years and 10 months from starting operations!




Also EICUG is in transition

- EICUG has changed its Charter adapting itself to the new phase (that is an experimental Collaboration exists): no longer quarterly meetings, no longer IB
- ePIC and EICUG will still need to be adaptive in the coming months/years
- delicate balance between theoretical/experimental communities, lobby for 2nd detector and reality of an experiment to be built (and financed: all in-kinds are not yet commitments)
- a thanks to **Silvia** serving in the SC, congrats and good work to **Marta**!
- congrats to **Marco** for serving now as SC chair

<https://indico.cern.ch/event/1238718/>

- 15 from Italy @ Warsaw (over 73!!!)

The poster for the Electron-Ion Collider User Group Meeting 2023 is set against a blue background. At the top, the title "Electron-Ion Collider User Group Meeting" is written in orange and white. Below it, a tagline reads "The world's most powerful microscope for studying the 'glue' that binds the building blocks of visible matter". The EICUG logo, featuring a stylized particle detector, is prominently displayed in the center. To the right, the year "2023" is shown in large white and orange digits. A winding white path, resembling a river, flows from the top right towards the bottom, with labels "Early Career", "EICUG", "ePIC", and "Detector-II" placed along its course. The "Visula River" is also labeled. Below the EICUG logo, the "International Advisory Committee" and "Local Organising Committee" are listed with their members and affiliations. At the bottom, the dates "JULY 23 - 31 2023" and the location "Warsaw" are displayed in large white letters. The Indico logo and the URL "https://indico.cern.ch/e/EICUG2023" are at the bottom right, next to a QR code.

Electron-Ion Collider User Group Meeting

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

EICUG 2023

Early Career

EICUG

ePIC

Detector-II

Visula River

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:

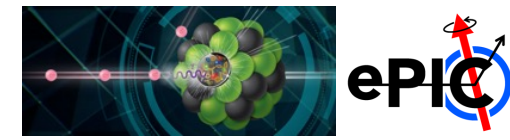
- T. Altinoluk (NCBJ)
- B. Badelek (U. Warsaw, chair)
- D. Kikola (WUT)
- M. Suster (Candela F., U. Warsaw)
- P. Sznajder (NCBJ)
- J. Wagner (NCBJ)

JULY 23 - 31 2023

Warsaw

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

Our best investment for the future



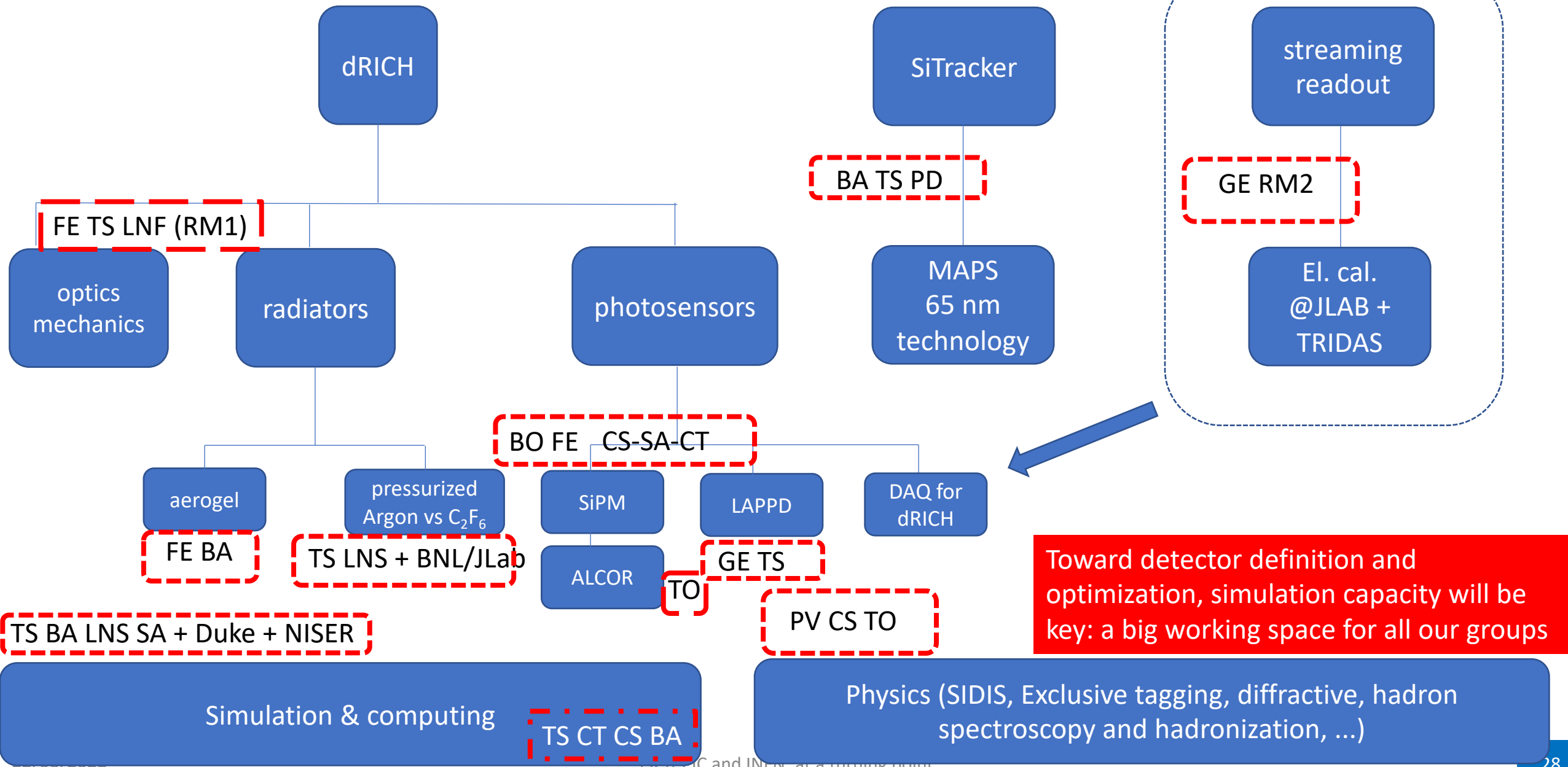
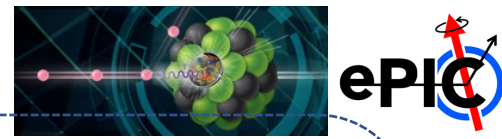
1ST EUROPEAN SCHOOL ON THE PHYSICS OF THE ELECTRON-ION COLLIDER

18–22 Jun 2023
Corigliano-Rossano, Italy

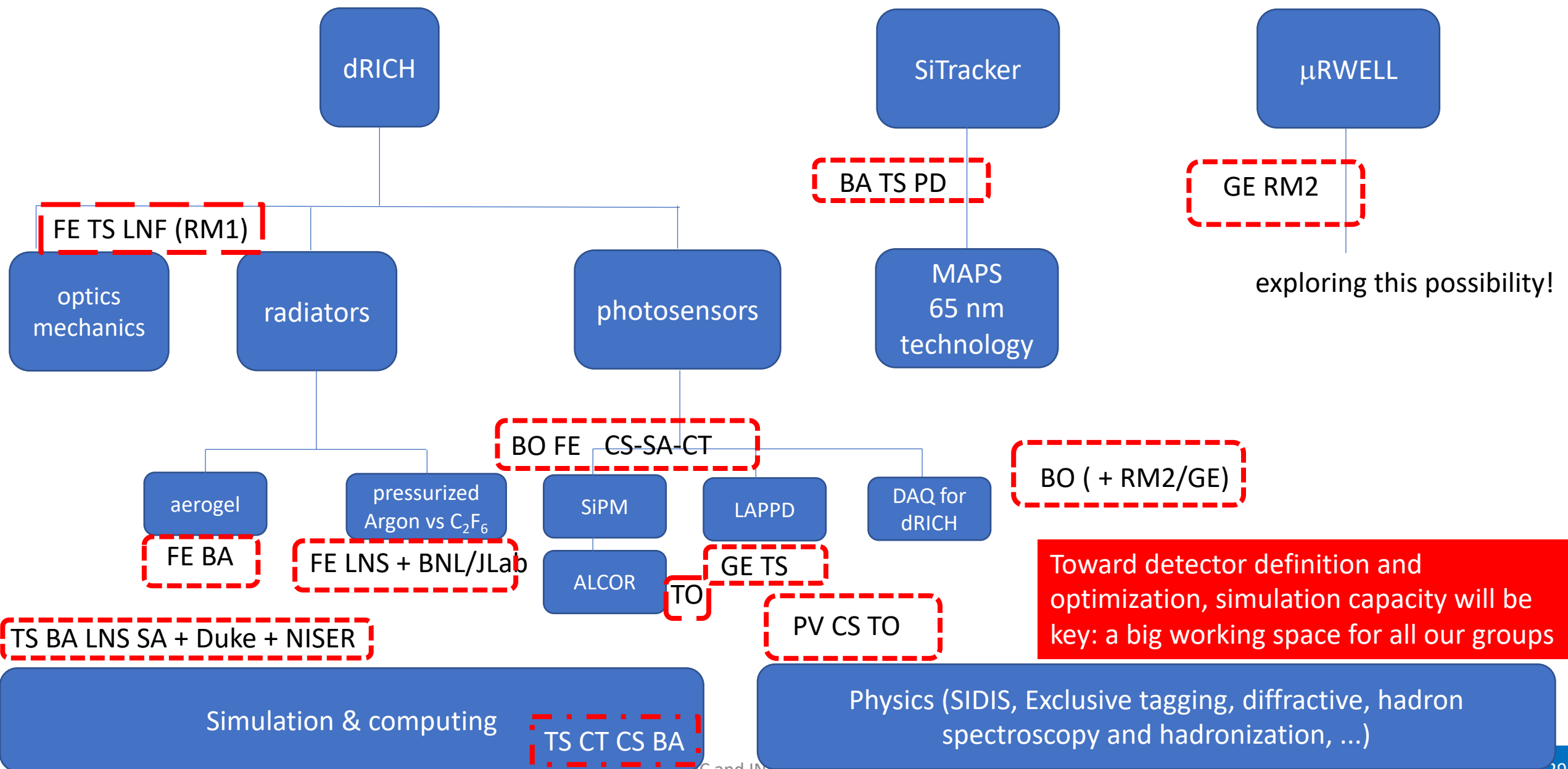


- nice mix of experimental and theoretical communities
- 28 participants: 2 from India (+1), 1 from Poland, 1 from Germany, 3 "from fisica applicata + chemistry", **the rest (22) from INFN** at large (participants: 33%F – 67%M, lecturers: 40%F – 60%M, organizers: 45%F – 55%M) – 3 undergraduates
- excellent synergies among Universities and groups, good sponsorships, a superthank to Abhay and CFNS

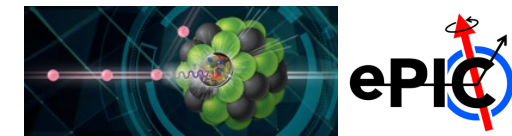
A map end of 2022



some update (not all)



Some news as RN from INFN groups



visits to several INFN groups (TO, TS, GE, PV, RM2)


seminar in Pavia (22 March)

developments:


- two post-docs (BO RM2) positions using EIC DoE funds
- upcoming: post-doc positions in BO and PhD positions in PD and BO → soon upcoming: post-doc positions in TO
- PV group will have an "experimental leg" (S. Costanzo's group) → involvement in SVT DSC
- involvement of RM2 and RM1 on using AI algorithms for dRICH reconstruction (see [APEIRON talk](#) at CHEP)
- RM1 (A. Lonardo, E. Cisbani, G. Urcioli, P. Vicini) will rejoin EIC_NET → involvement in dRICH DSC
- PD (S. Levorato) might possibly join dRICH DSC
- Milano Bicocca expressed an interest but then they didn't materialize
- LNF (M. Mirazita) will leave EIC_NET in 2024

Tomorrow discussion is about planning the turning point:
making expression of interests **committments**

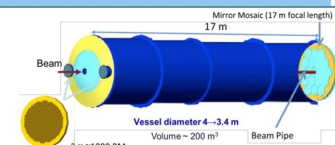




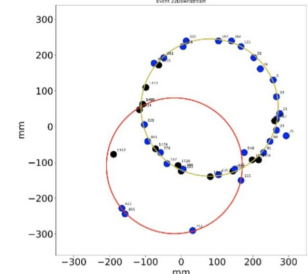
PID in NA62 RICH using NN on FPGA at L0 Trigger



- **Goal:** for any event detected by the RICH provide an estimate for the **number charged particles** and the **number of electrons**
- Streaming readout processing on FPGA using Neural Networks for classification (10 MHz).
- Produce a new primitives stream for Level 0 Trigger Processor
- **The main challenge is the processing throughput**

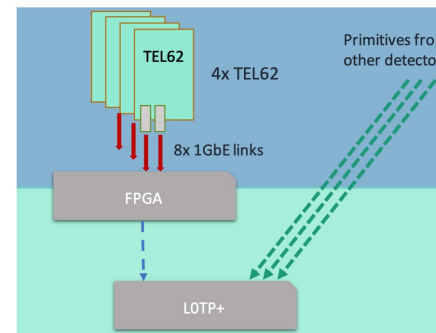


Beam
Mirror Mosaic (17 m focal length)
17 m
Vessel diameter 4-3.4 m
Volume ~ 200 m³
Beam Pipe
2 x ~1000 PM



2048 Readout channels
→ INPUT

Can we produce rings information
online for the L0TP+
level 0 trigger?



TEL62
4x TEL62
8x 1GbE links
FPGA
L0TP+
Primitives from other detectors

12/05/2023

CHEP 2023

10

Magnet

- New 1.7 T SC solenoid

Tracking

- Si Vertex Tracker MAPS/ITS3 wafer-level stitched sensors
- Si Tracker MAPS/ITS3/EIC barrel and disks
- MPGDs (μ RWELL/MMG) cylindrical and planar

PID

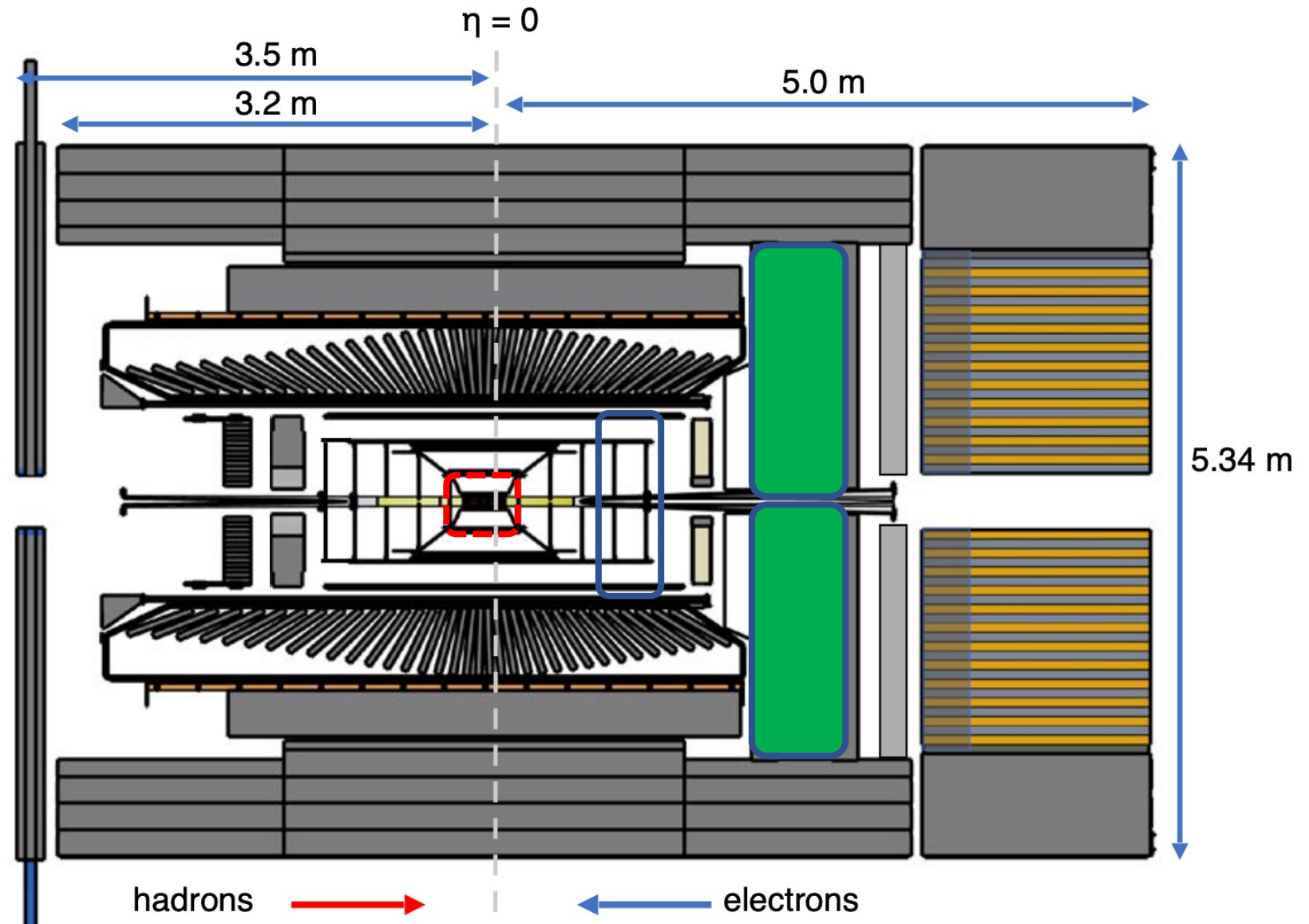
- high performance DIRC (hpDIRC)
- dual RICH (aerogel + gaseous)
- aerogel proximity focusing pFRICH
- ToF using AC-LGAD

EM Calorimetry

- imaging EMCal
- finely segmented W/SciFi EMCal
- PbWO₄ EMCal

Hadron Calorimeter

- re-used sPHENIX Fe/Sc
- long. separated Fe-W-Sc calorimeter w/ high- η insert



Our agenda

14:00	Corigliano-Rossano		13:00 - 14:30
	Welcome and introduction from INFN Cosenza	Enrico Tassi et al.	14:30 - 14:40
	Corigliano-Rossano		
15:00	EIC in 2023: from here to operations start in 2031	Abhay Deshpande	14:40 - 15:20
	Corigliano-Rossano		
	Status EIC/ePIC and INFN involvement: at a turning point	Pietro Antonioli	15:20 - 15:55
	Corigliano-Rossano		
16:00	ePIC: engage the Italian community with physics	Salvatore Fazio	15:55 - 16:35
	Corigliano-Rossano		
17:00	Coffe break (and departure of students of EIC School)		17:00 - 17:30
	Corigliano-Rossano		
	Status of ePIC tracker and overview of INFN R&D	Domenico Colella	17:30 - 18:00
	Corigliano-Rossano		
18:00	Bending, test and characterization	Rosario Turrisi et al.	18:00 - 18:30
	Corigliano-Rossano		

social dinner on the terrace

	Status of ePIC forward dual RICH and overview of INFN R&D	Marco Contalbrigo	08:30 - 09:00
	Corigliano-Rossano		
09:00	dRICH simulation: towards definition of dRICH geometry	Chandradoy Chatterjee	09:00 - 09:30
	Corigliano-Rossano		
	Towards ALCOR64	Fabio Cossio	09:30 - 09:50
	Corigliano-Rossano		
10:00	Photosensors	Roberto Pregarhella	09:50 - 10:20
	Corigliano-Rossano		
	Wrap-up discussion toward dRICH review (July 2023)		10:20 - 10:30
	Corigliano-Rossano		
	Coffee break		10:30 - 11:00
	Corigliano-Rossano		
11:00	Interest on uRWELL in ePIC	Alessia Fantini	11:00 - 11:20
	Corigliano-Rossano		
	Planning INFN contribution to computing	Andrea Bressan	11:20 - 11:40
	Corigliano-Rossano		
12:00	The big planning picture	Pietro Antonioli	12:00 - 12:30
	Corigliano-Rossano		
	Discussion		12:30 - 13:00
	Corigliano-Rossano		
13:00	Lunch		
	Corigliano-Rossano		
14:00	Discussion		13:00 - 14:15
	Corigliano-Rossano		
15:00	Time for community discussion and planning		14:15 - 16:00
	Corigliano-Rossano		
16:00	Coffee break and departure from the resort		16:00 - 17:00
	Corigliano-Rossano		
17:00			