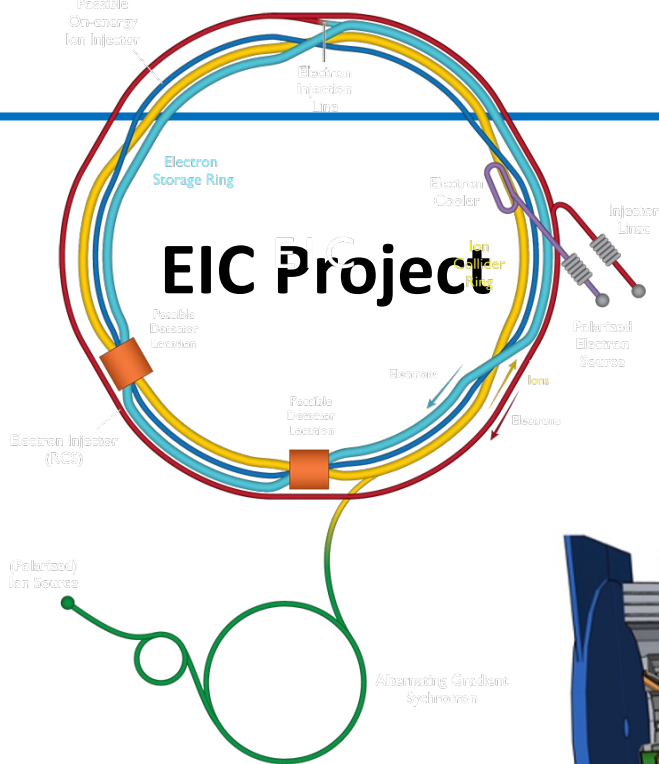
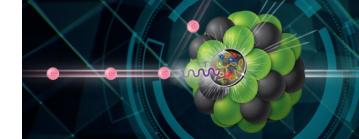


EIC_NET status

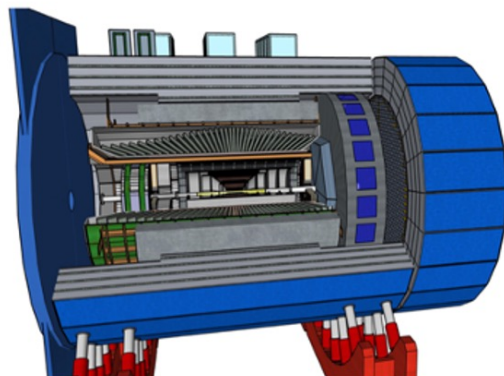
P. Antonioli
INFN-Bologna



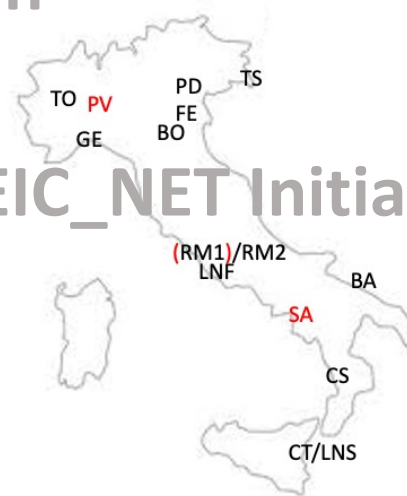
EIC Project

Yellow boxes are takehome messages for 2023

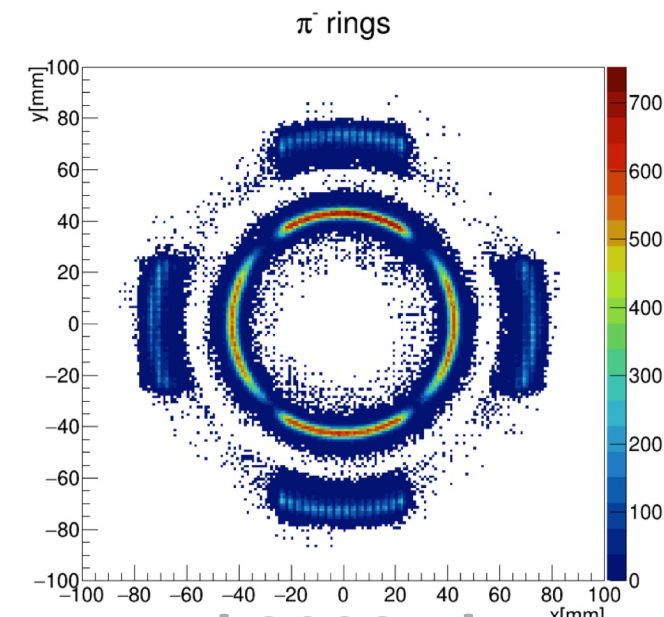
EPIC Collaboration



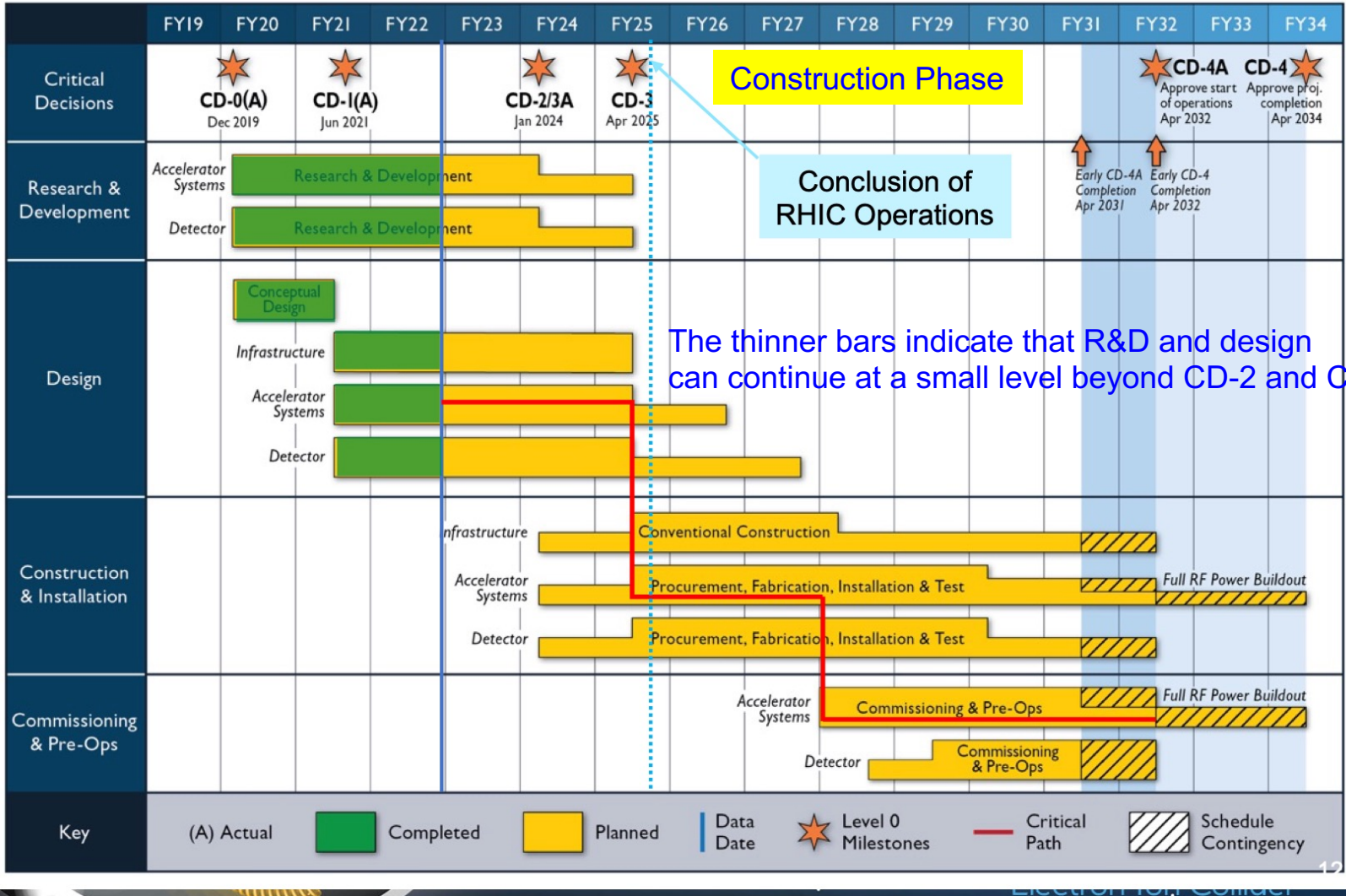
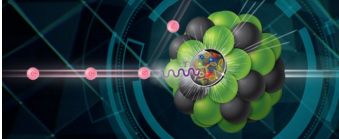
EIC_NET Initiative



Last General Meeting (online 5/12)
<https://agenda.infn.it/event/32832/>



Status EIC project: timeline



CD-2/3A moved to Jan 2024
October 2023 pre-TDR

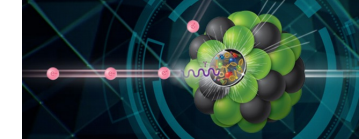
CD-3 moved to April 2025
TDR end of 2024/Jan 2025

As detector we need to be ready by Jun 2031, rumors of possible CD-2/3A "optimization", given available resources via IRA, but anyway CD-3 will not change.

2023 is the year where we define O(60%) of final detector/sub-systems.

"step-up" in the level of details for dRICH and silicon vertex

EIC and high-level governance



12-13 October: pre-RRB (Resource Review Board) meeting between EIC project management, DoE, funding agencies reps. (INFN: Bettoni, Nania), EPIC interim-SC, EPIC funding agencies PI
positive, no "stop" with respect to a RRB for the detector side 'à la CERN"

- ✓ first RRB: 2-3 April 2023
- ✓ a multi-lateral agreement (MoU) foreseen for EPIC (legal instrument between funding agencies)

17 November in-camera meeting between DoE (Washington) and other funding agencies (UK, France, Canada, Japan) (INFN: Bettoni) re: EIC

- ✓ INFN reiterated in-kind resources ("not-binding") we indicated in the EoI call (Nov 2020)
- ✓ Bettoni in RRB Chartered drafting committee
- ✓ INFN and STFC very much aligned in terms of commitment/internal deadline

pre-meeting (Antonioli, Bettoni, Campana, Dalla Torre, Nania + Gallo, Cimino (INFN LNF/accelerators) on 8th November:
INFN in-kind contribution ("accelerator-side") is taking shape:

- ✓ Cimino's group (LNF): analysis for materials to curb SEY → MoU
- ✓ INFN PD (mechanical workshop): interested but not for rings for hadron beam line → in contact

Very high-level MoUs between Italy/US governments and INFN DoE already in place. **Next steps:**

- RRB Charter
- multilateral agreement behind EPIC
- ad-hoc MoUs between INFN and BNL for accelerator contributions in-kind



To be matched
with CSN3
"sigla" request
July 2023 for
preventivi 2024

Status EIC project: eRD "targeted" funding + FY23



Project	Topic
eRD101	Modular RICH / aerogel RICH
eRD102	Dual-radiator RICH
eRD103	High-performance DIRC
eRD104	Silicon service reduction
eRD105	SciGlass
eRD106	Forward EMCAL
eRD107	Forward HCAL
eRD108	Cylindrical / planar MPGD
eRD109	ASICs / electronics
eRD110	Photosensors
eRD111	Silicon tracked (excluding electronics)
eRD112	AC-LGAD (including ASIC)
eRD113	Sensors for silicon trackers

BA-BO-CS-CT-FE-LNF-LNS-RM1-SA-TO-TS

GE-RM2 (streaming readout)

TO

BO-FE-CS (**SiPM**) + TS-GE (**LAPPD**) (TO in FY22)

BA-TS-PD

BA-TS-PD

Focus on detector R&D common to
protocollaboration proposals

Resources finally allocated by EIC
project in April 2022 for FY22 (7
months delay due to US delayed
approval of Federal Budget): 265 k\$

- Resources mainly for post-doc and/or PhD positions
- eRD projects as a space to build alliances/consortia for detectors

For FY23 eRD resources might
equal CSN3 resources! A win/win
operation. Careful planning of
PhD and "CdR" (former assegni)!

- requests presented [at DAC \(Detector Advisory Committee\) 19-21 October](#) "positive feedback"
- "expect letters this week or anyway by Christmas" (cit E.A.)

Other news



[EICUG Fall Quarterly meeting](#): 17 November → see Marco's presentation

[community input for the NuPECC Long Range Plan 2024](#)

from EIC:

- a contribution from EIC project ([arXiv:2211.02785](#))
- a contribution from EICUG SC (Radici, Dalla Torre)
- a contribution from INFN (EIC_NET and NINPHA) (Antonioli, Radici)

<https://indico.ph.tum.de/event/7050/contributions/6419/>

Input of the INFN community involved in the EIC to the NuPECC Long Range Plan 2024

Not scheduled
20m

Description

This document has been prepared by the representatives of the two major INFN initiatives related to the Electron Ion Collider, as input to the discussion on the next NuPECC Long Range Plan 2024. The activities and interests of this large community (more than 100 researchers) are described, including the foreseen contribution to the EIC science and R&D program. The synergies between these activities and Nuclear Physics in Europe are discussed, followed by a small set of suggested specific recommendations.

Primary authors

Marco Radici (INFN - Sezione di Pa...)
Pietro Antonioli (INFN - Bologna)

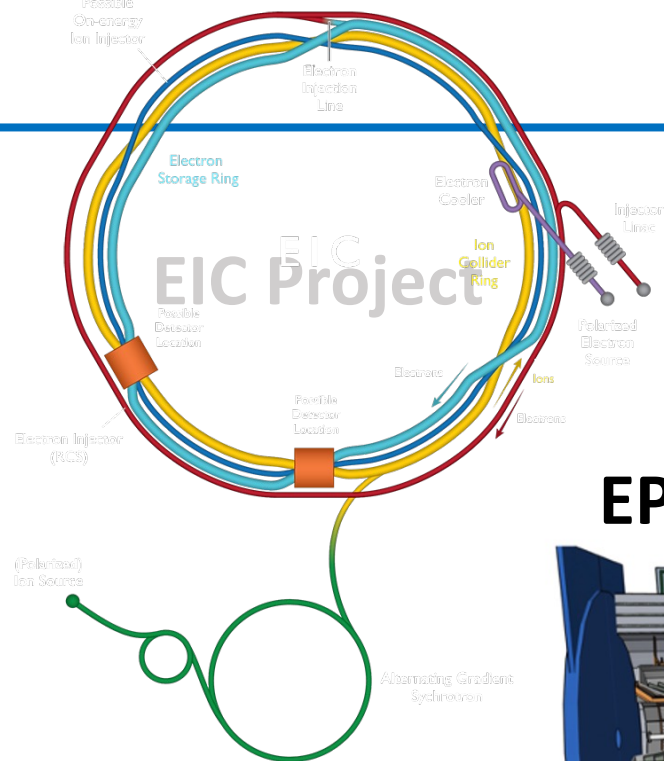
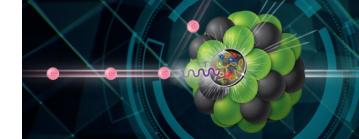
Presentation materials

INFN_EICcommunity-NuPECC-LRP.pdf

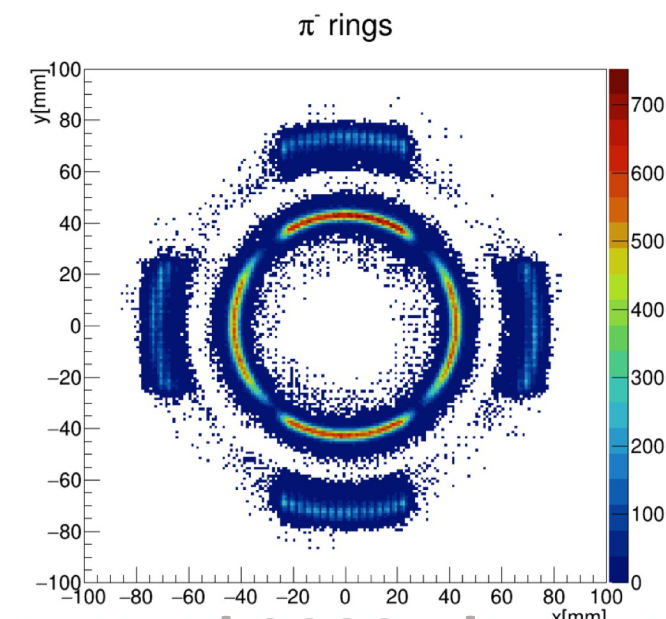
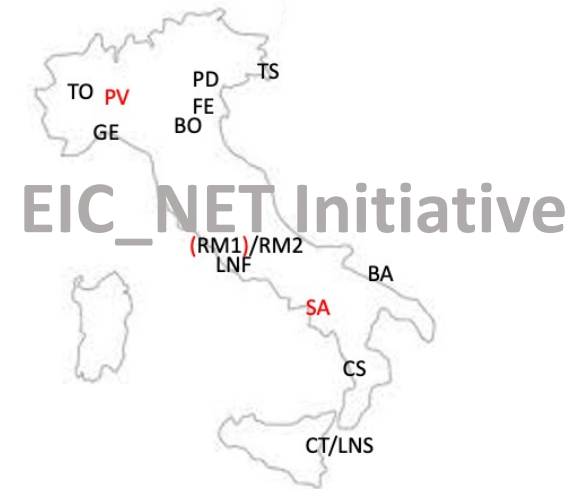
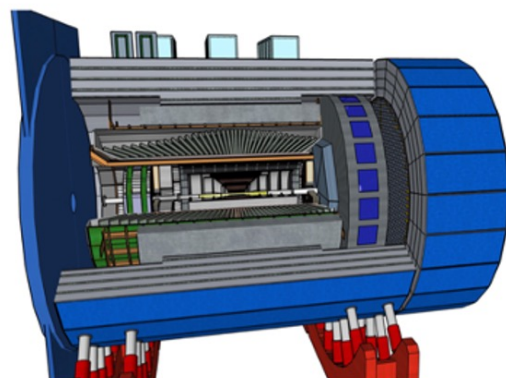
10:00	Welcome and News from the Steering Committee	Marco Radici et al.
	News from the Project	Rolf Ent
	BNL	10:20 - 10:50
11:00	News from ePIC	Bernd Surrow
	News from the 2nd Detector Working Group	Pawel Nadel-Turonski
	Break	
12:00	Update from the Software Working Group	Andrea Bressan et al.
	News from the ED&I Committee	Dr Paul Gueye
	Update from AI4EIC	Cristiano Fanelli et al.
13:00	EICUG Charter Discussion	Richard Milner

Note US "parallel" process and
in particular outcomes of QCD Town Hall meeting
<https://indico.mit.edu/event/538/>

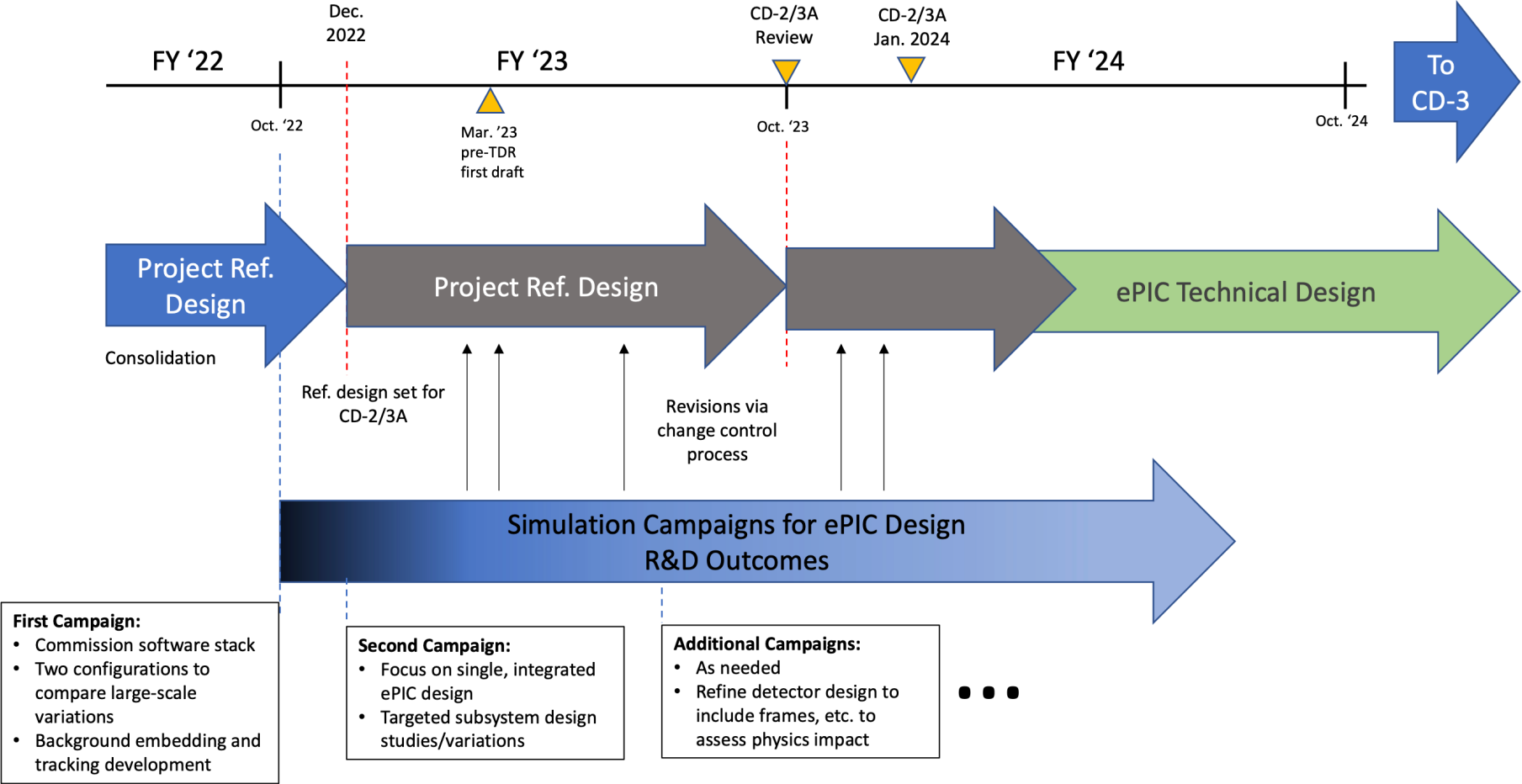
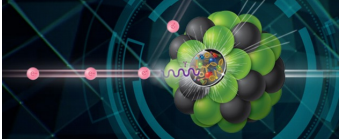
+ EIC White Paper under preparation to NSAC



EPIC Collaboration



2023 in details (from EPIC SC)



Status of EPIC/ePIC: last quarter updates

- Since our last general meeting 5 EPIC general meetings so far, 1 before Xmas
- governance: drafted EPIC Collaboration Charter (circulated for comments 6 October, amend taking into account comments 10 November, open to vote 1st December)
- difficult start of first simulation campaign (not easy!). See updates through general meetings + Annalisa/Salvatore talk
- critical discussions/decisions on:
 1. backward TOF layer
 2. barrel ECAL calorimeter technology: SciGlass vs imaging
 3. mRICH vs pfRICH

decision taken

} not expected decision before end of the year, but full analysis in progress

December 2022

20 Dec [EPIC General Meeting](#)

08 Dec [EPIC General Meeting](#)

November 2022

22 Nov [EPIC General Meeting](#)

10 Nov [EPIC General Meeting](#)

October 2022

28 Oct [EPIC General Meeting](#)

06 Oct [EPIC General Meeting](#)

Charter to be approved by 14th December
Next: leadership elections! → CEI meeting

In 2023 toward sub-systems oriented structure of Collaboration

Logo 1



10/6/2022

Logo 11



Logo 16



Logo 3



Review meetings on-going also for us...



Calendar – recent highlights and upcoming events

- ✓ ☐ October 2022: First simulation campaign started, detector subsystem review etc.
 - ✓ ○ October 18/19: 60% Design Review Magnet
 - ✓ ○ October 12-13: Resource Review Board kick-off meeting
 - ✓ ○ October 19-21: Detector Advisory Committee meeting
 - ✓ ○ Start of the first phase of the simulation campaign – a lot of effort here!
- ➡ ☐ November 2022++: Validation first simulation campaign, detector subsystem reviews,
 - November 15-16: EIC Generic Detector R&D Meeting
 - December (first two weeks): Calorimeter Review
 - December (before end of CY): Polarimetry Review
 - Incremental Integration/Installation Review
 - more subsystem reviews (Tracking, PID, Infrastructure, Magnet Incremental Design and Safety)
- ☐ January 31 – February 2023: DOE OPA Status Review
- ☐ May 2023: first version of pre-TDR October 2023: final version of pre-TDR

Backward TOF decision



Conclusion: Backward ToF

Email announcement to the EPIC collaboration 4 November 2022

Dear ePIC:

As you are probably aware, over the past several weeks the collaboration has been engaged in discussions regarding the configuration and integration of the backwards TOF. Recent discussions in the Global Detector and Integration working group include:

<https://indico.bnl.gov/event/17081/>
<https://indico.bnl.gov/event/17534/>

and the topic was also discussed in the Oct 28th General Meeting:

<https://indico.bnl.gov/event/17602/>

Following our procedures in ePIC, the GDI group has made recommendations to the SC and collaboration based on input from both the Project and Detector Working Groups:

A fast RICH photo-sensor, specifically the LAPPD, provides a better-integrated detector solution for the backward t0 measurement than an AC-LGAD layer. In addition, LAPPDs offer also other advantages: a reduced material budget with respect to SiPM sensors and a reduced temperature gradient in the proximity of the backward ECal. There is strong indication that this measurement can also be realized and augmented using 3D_VerTEX-time correlation

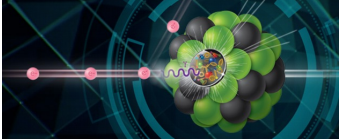
In consultation with the Project, the SC has accepted the GDI recommendations. Moving forward, the reference design will not reserve space for a backwards AC-LGAD layer and we will assume LAPPD readout for the backwards RICH.

The SC would like to thank both GDI, the TOF-PID WG and the whole collaboration for their tireless efforts to make ePIC the best EIC detector we can build!

Regards,
Silvia, Or, Tanja, John and Bernd

Addition: for pfRICH now revamped efforts from BNL/SBU potential for collaboration/synergies with dRICH (even if likely photosensor technology might be different at the end)

How to get involved (ePIC)



EPIC

Enter your search term

Create event

Navigate

Parent category

Project-Collaboration Management	25 events
Tracking	18 events
Calorimetry	34 events
Far Forward	12 events
Far Backward	19 events
DAQ / Electronics / Readout	23 events
Software and Computing	62 events
General Meetings	12 events
CerenkovPID	24 events
ToF-PID	15 events
Global Detector & Integration	18 events
Simulation, Production & QA	149 events
Inclusive Physics	9 events
Semi-Inclusive Physics	10 events
Exclusive, Diffraction, & Tagging Physics	6 events
Jets & Heavy Flavor	22 events
BSM & Precision EW	17 events
WG Convener Meetings	13 events
IB	1 event
Steering Committee	1 event
ePIC Charter Committee	5 events

Managers

Bernd Surrow

E. C. Aschenauer

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.

E. C. Aschenauer

John Lajoie

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

05/12/2022

EIC_NET - General Meeting

12

How to get involved (ePIC)



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

Eic-projdet-bsmew-l	[EPIC-BSM-EW-WG]	
Eic-projdet-calor-l	[EPIC-Calo-WG]	
Eic-projdet-collab-l	[EPIC-Collaboration]	←
Eic-projdet-compsw-l	[EPIC-CompSw-WG]	←
Eic-projdet-conveners-l	[EPIC-Conveners]	
Eic-projdet-cpid-l	[EPIC-CerPID-WG]	←
Eic-projdet-daq-l	[EPIC-DAQ-WG]	←
Eic-projdet-excldiff-l	[EPIC-ExclDiff-WG]	←
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Eic-projdet-globalint-l	[EPIC-GlobalInt-WG]	
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Eic-projdet-jethf-l	[EPIC-JetHF-WG]	←
Eic-projdet-sc-l	[EPIC-SteeringGroup]	
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Eic-projdet-simqa-l	[EPIC SimQA WG]	←
Eic-projdet-tofpid-l	[EPIC-ToFPID-WG]	
Eic-projdet-tracking-l	[EPIC-Tracking-WG]	←
Eic-projdet-trk-recon-l	[EPIC-TrkRecon]	←

EPIC highlighted meetings (CET times)



General meetings: Friday 3:30 AM or Friday 4:30 PM

Global integration: Monday at 3:00 PM

dRICH Simulation meeting: Wednesday at 6:30 PM

Computing & Software: Wednesday at 7:00 PM

DAQ meeting: Thursday at 2:00 PM

Tracking: Thursday at 5:00 PM

Cerenkov PID: Friday at 2:30 PM

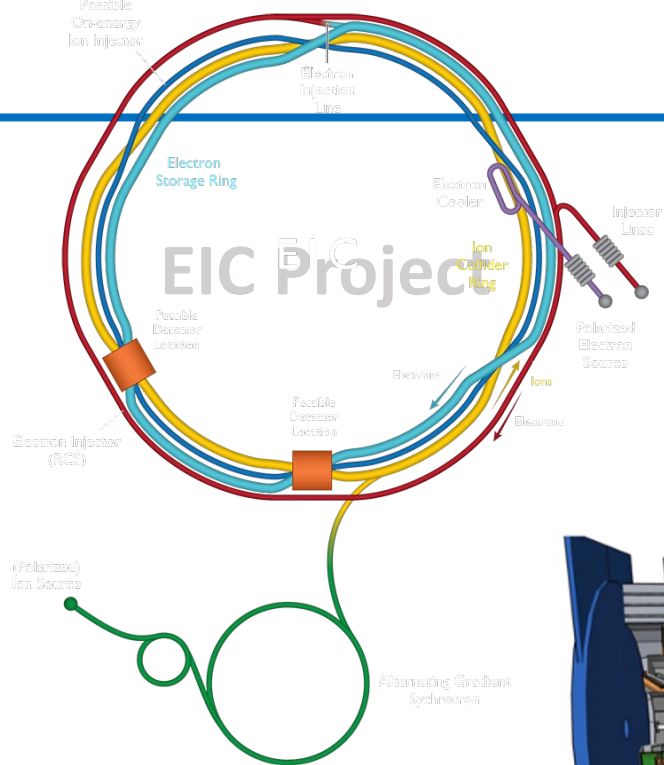
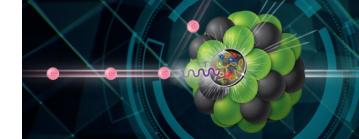
Exclusive/diffractive: Monday at 6:00 PM

SIDIS: Tuesday at 2:30 PM

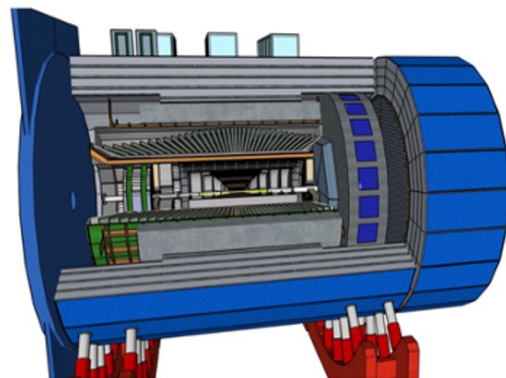
Jets and HF: Thursday 7:00 PM (not meeting since Oct)

WG Conveners: Friday at 4:30 PM (or 3:30 PM)

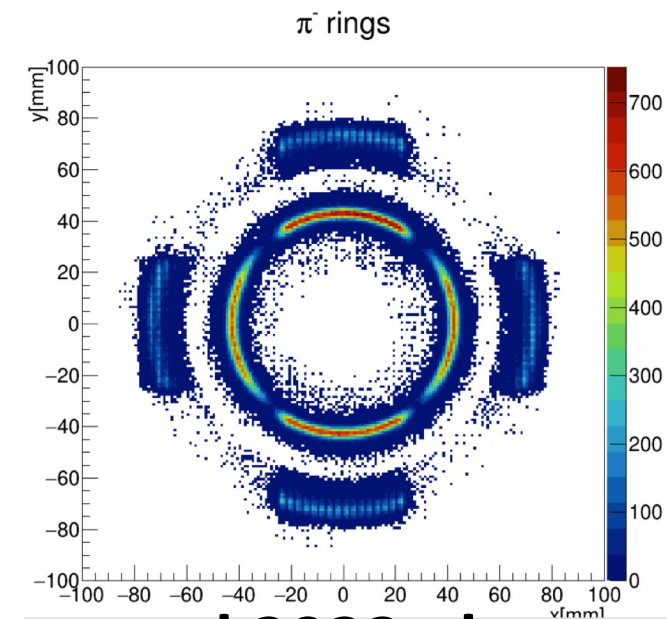
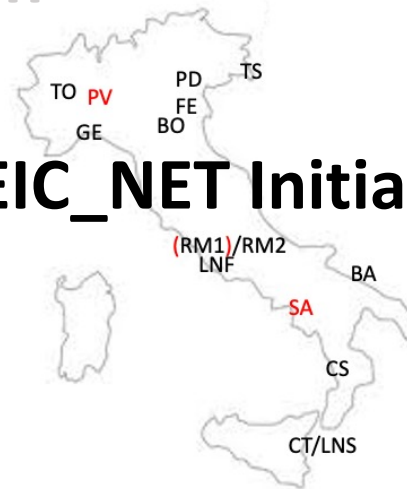
+ many other "parallel/out of normal schedule" meetings (ex. aerogel, mechanics, EIC Silicon Consortium SC,...)



EPIC Collaboration



EIC_NET Initiative



CNS3 budget session + plans



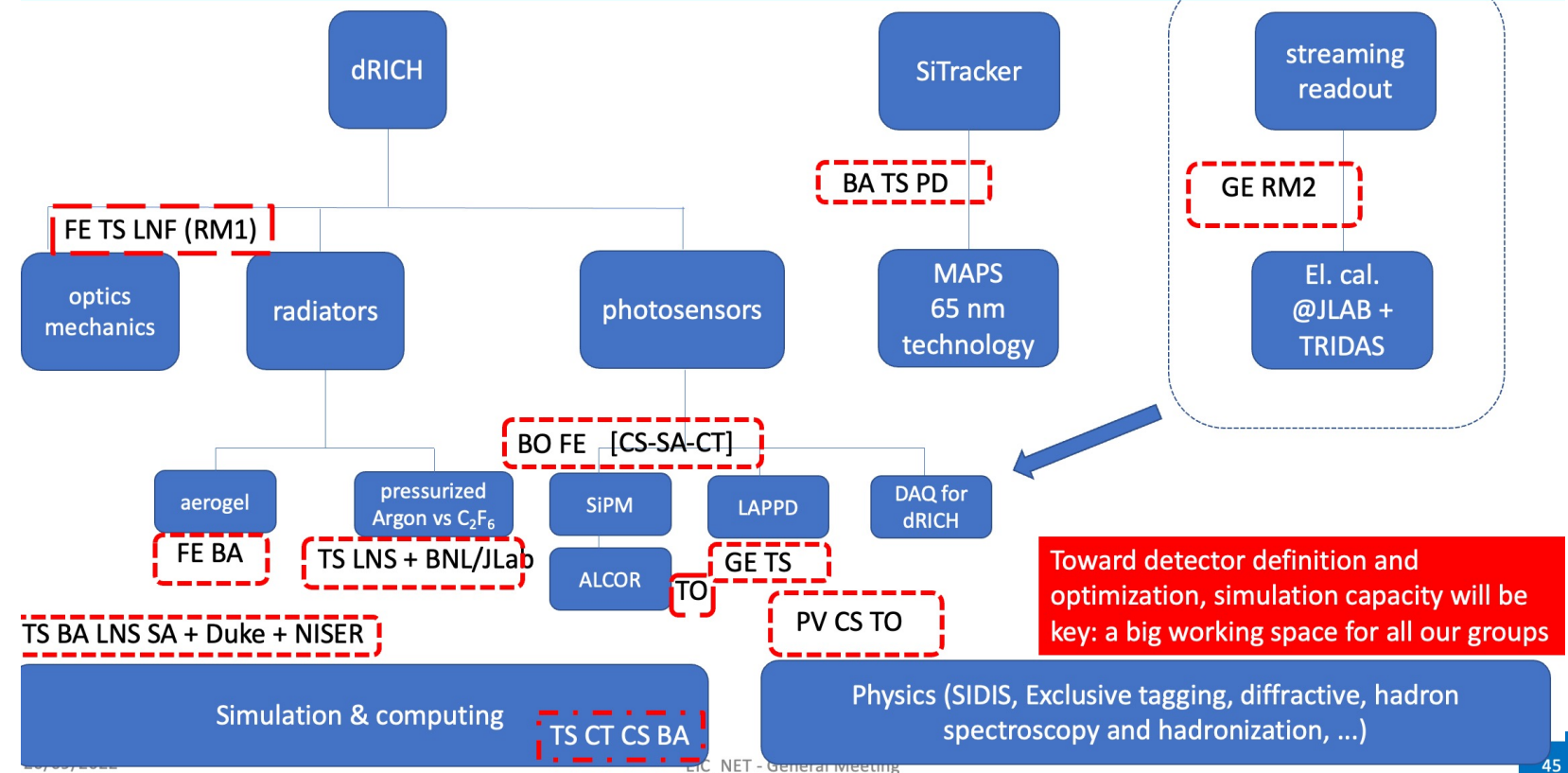
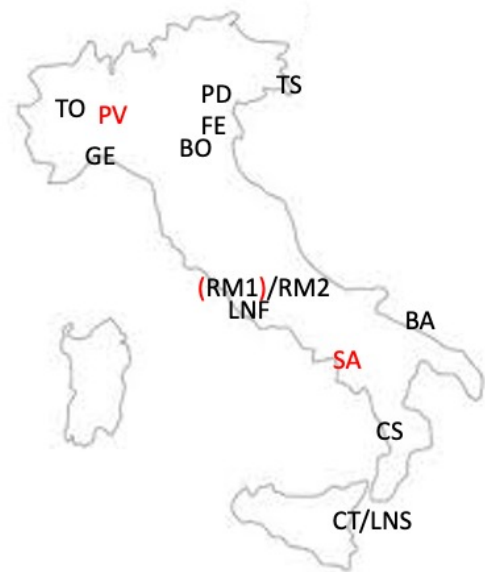
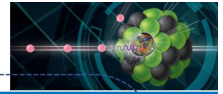
Positive evaluation by referee/CSN3:

Requests: 487 kEU (missioni 185 kEU)

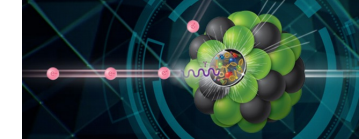
Funded: 325 kEU (missioni 117.5 kEU)

- Indication to grow FTE but general positive attitude!
- Understanding in 2024 we will move to sigla (EPIC)

2023: from networking to experiment mode



(since October 3rd) and today's agenda



- dRICH (dRICH prototype with PMT and SiPM + LAPPD) test at CERN/PS
- two irradiation sessions at TIFPA (5th November, 3rd December)
- Alcor V2 finally submitted
- vessel pre-prototype ordered + several orders on the way (including SiPM for prototype, using DoE funding)
- simulation progresses
- finalization of long-standing work on gaseous photodetectors
- EIC School preparation (establishment of organizing committee, venue, ...)

10:30	→ 10:50	Status EIC project - end of the year news Speaker: Pietro Antonioli (Istituto Nazionale di Fisica Nucleare)	🕒 20m	📎
10:50	→ 11:00	News from EICUG Speaker: Marco Radici (Istituto Nazionale di Fisica Nucleare) radici.pdf	🕒 10m	📎
11:00	→ 11:20	Simulation and Physis Performance WG update Speakers: Annalisa Mastroserio (Istituto Nazionale di Fisica Nucleare) , Salvatore Fazio (Universita' della Calabria ed INFN-Cosenza)	🕒 20m	📎
11:20	→ 11:35	Quick update from dRICH test beam Speaker: Simone Vallarino (Istituto Nazionale di Fisica Nucleare)	🕒 15m	📎
11:35	→ 11:50	Gaseous photodetectors: development of ND photocathodes Speaker: Chandradoy Chatterjee (Istituto Nazionale di Fisica Nucleare)	🕒 15m	📎
11:50	→ 12:05	Gaseous photodetectors: MPGD photodetector read-out with VMM3 FE ASIC Speaker: Daniele D'Ago (Istituto Nazionale di Fisica Nucleare)	🕒 15m	📎
12:05	→ 12:20	EIC School 2023 Speaker: Enrico Tassi (Istituto Nazionale di Fisica Nucleare)	🕒 15m	📎
12:20	→ 12:30	AOB	🕒 10m	📎

2023 challenges and schedule



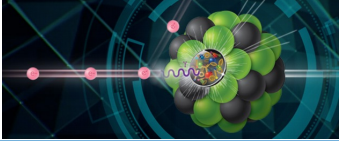
Challenges

- follow EPIC process closely because decisions next 6 months will have long-term impact on our work and responsibilities
- deliver key R&D: MAPS stichting, aerogel, SiPM/LAPPD and simulation/reconstruction → assess performance → pre-TDR
- build "detector" alliances (forward & backward RICHes, Silicon)
- define INFN responsibilities in new EPIC structure
- define INFN groups responsibilities in detector sub-systems (dRICH, tracking)
- find EIC_NET "way of working"

Schedule

- ePIC Collaboration meeting: 9-12 January (Jlab + online): <https://indico.bnl.gov/event/17621/> **REGISTER!**
- R&D (note difficult CERN plans: no SPS since October 3rd)
- INFN "preventivi" + request for sigla: June-July
- EIC School: 18-22 June Rossano Calabro
- EIC Giornate Nazionali: 22-23 June Rossano Calabro (arrival on 22 by 2 PM, departure early morning 24)
- EICUG + EPIC Collaboration meeting: 24-31 July Warsaw (+ online) (format under discussion)

How to get involved (EIC_NET)



<https://agenda.infn.it/category/1147/>

EIC_NET

Enter your search term

Simulation and Physics Performance	38 en
Miscellanea	1 event
Giornata Nazionale	4 events
Incontri con i referee	4 events
Comitato EIC Italia	3 events
dRICH	12 events
EIC_NET meetings	3 events

EIC_NET meetings

Enter your search term

General meetings (online) for EIC_NET community These meetings are at large for the whole EIC_NET INFN community as an update channel on the various activities. They are held every 2-3 months, depending on developments on EIC project and critical achievements in R&D carried out by INFN groups.

Zoom links in each event page.
General mailing list: eic_net_all@lists.infn.it

March 2022

28 Mar [riunione EIC_NET](#)

January 2022

31 Jan [riunione EIC_NET](#)

Wednesday at 11:30-13:00 bi-monthly
today and previous editions (since 1919)
Monday at 11:30-13:00 bi-monthly

Quarterly general meetings (online)
Monday 10:00 – 13:00

next: **October 3rd**
December 5th



- SiPM electronics is meeting on Tuesday at 9:00 AM (weekly)
- dRICH test beam data analysis Monday at 9:00 AM (weekly)
- EIC Silicon consortium is meeting on Monday at 7:00 PM (bi-weekly)

lists.infn.it/sympa

Cerca nelle liste

eic

Cerca nelle liste:

7 risultato/i trovato/i

E

eic-montecarlo@lists.infn.it
Mailing list per discussione Monte Carlo EIC

eic_net_pid@lists.infn.it
PID group of EIC_NET

eic_net_all@lists.infn.it
Tutti i partecipanti alla collaborazione EIC_NET

eic_net_executive_board@lists.infn.it
EIC_NET, componenti executive board

eic_net_referee@lists.infn.it
EIC_NET, referee di CSN 3

eic_net_resp@lists.infn.it
Tutti i responsabili locali di EIC_NET

S

sipm4eic-elettronica@lists.infn.it
Mailing list per discussione elettronica SiPM EIC_NET

Monte Carlo (detector) & physics
dRICH
our community

+ eic_net-tracking

sub-system: think about other

05/12/2022

EIC_NET - General Meeting

19

How to adapt our meetings?



Currently:

- CEI meetings ("random" + INFN standard planning [consuntivi/preventivi/referees])
 - bi-weekly meetings on three streams (dRICH, silicon (not EIC_NET), simulation/physics)
 - quarterly general meetings
 - giornata nazionale
 - + many others ("doing things")
-
- risk of duplication of EPIC meetings
 - risk of key information being discussed only by small (random) groups of people
 - involve new comers properly

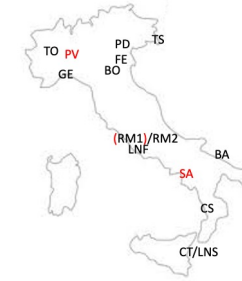
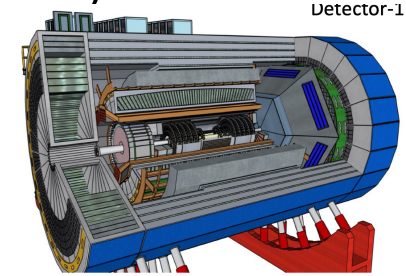
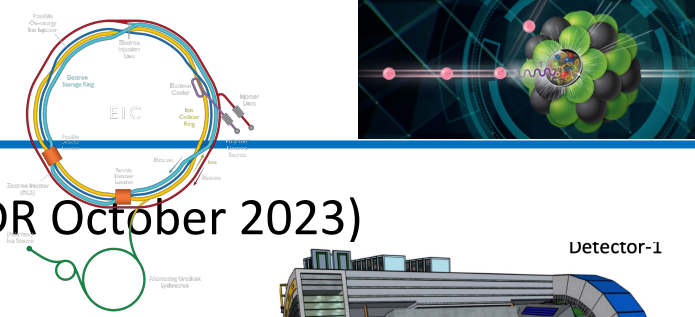
ideas about how to improve?

dRICH general "monthly" + others more specialized?
more general EIC_NET meetings? or less?
tracking? DAQ?
periodic news?

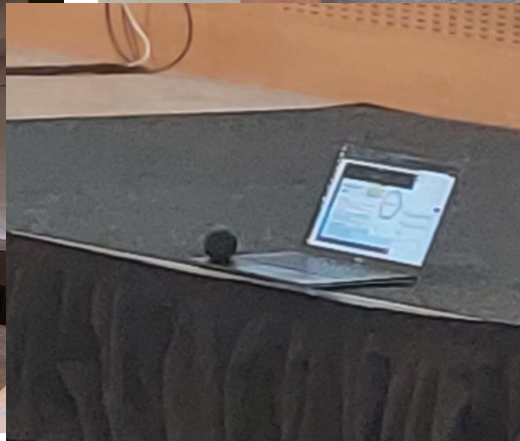
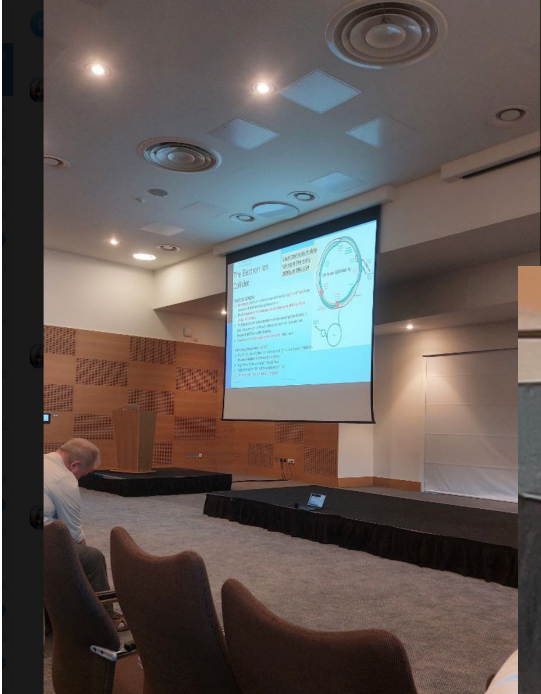
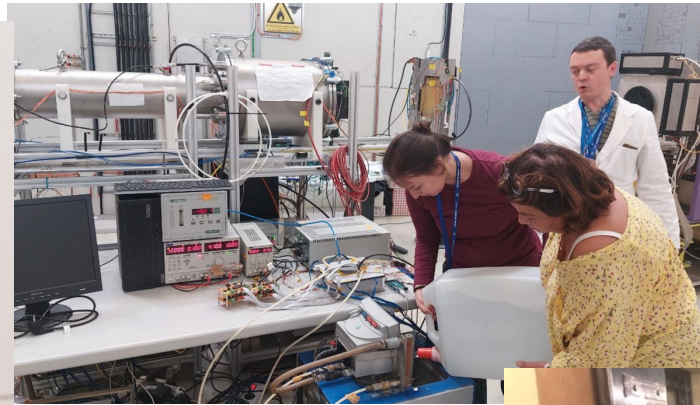
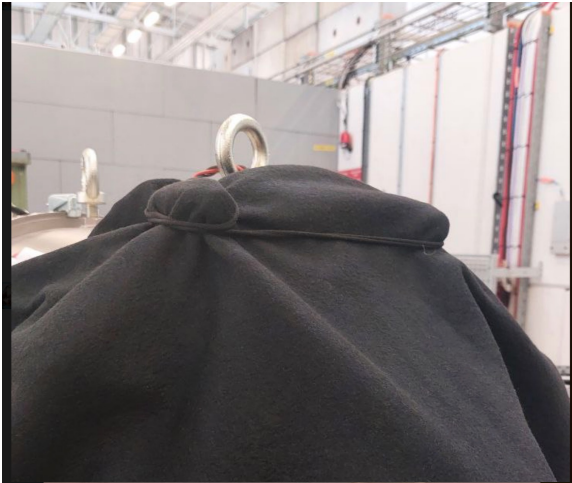
EIC meeting next week also to plan... but let's collect ideas!

Summary and outlook

- **EIC project well on track** : CD-2/3A next big milestone (approval Jan 2024, pre-TDR October 2023)
- **EPIC Collaboration for "Detector 1" formed**, INFN contribution clearly delineated adapt to new structure
- INFN participation taking shape, **moving from networking to experiment-mode**,
→ prepare all needed steps to become "sigla" in 2024 + MoU signing
→ re-organize consistently
- **Critical R&D for INFN** under way:
 - dRICH prototype tests: general performance, aerogel, pressurized Argon option
 - selection of technology for photosensors (SiPM as baseline, LAPPD as plan "B")
 - ASIC and FEE (and DAQ) R&D made accordingly
 - simulation effort toward pre-TDR
- take a seat on EIC physics and **grow an EIC generation**



2022.... Building EIC_NET community....





Dissemination work/ EIC_NET is improving its footprint



- SIF 2021 S. Dalla Torre, [Stato del progetto EIC](#)
- F. Ameli et al., [Streaming readout for next generation electron scattering experiments](#) , Eur. Phys. J. Plus 137 (2022) 8, 958
- INN2022, S. Vallarino, [The dual Ring Imaging Cherenkov detector for the Electron-Ion Collider](#)
- INFN2022, C. Chatterjee, [Particle Identification by the forward and backward RICHes of ATHENA proto-collaboration at EIC](#)
- INFN2022, N. Rubini, [SiPM response to radiation damage and annealing treatment for the EIC dual-radiator RICH](#)
- INFN2022, S. Kumar, [Performance simulation studies for the tracking detector at the Electron-Ion Collider](#)
- “From RHIC to EIC”, M. Contalbrigo, [eRD102 - Forward RICH \(dRICH\)](#)
- “From RHIC to EIC”, P. Antonioli, [eRD110 - Photosensors](#)
- 15th Pisa Meeting on AD, S. Dalla Torre, [ATHENA at EIC](#)
- Otranto School, S. Fazio, [Physics at the future Electron-Ion Collider](#)
- QCD@Work D. Elia, [EIC as the next QCD collider](#)
- ICHEP, L. Rignanes, [A SiPM-based optical readout system for the EIC dual-radiator RICH](#) (poster)
- NDIP R. Preghenella, A SiPM-based optical readout system for the EIC dual-radiator RICH
- HF-WINC, P. Antonioli, [Quarkonia and heavy flavour at EIC](#)
- RICH2022, S. Vallarino, “The dual Ring Imaging Cherenkov detector for the Electron-Ion Collider” (poster)
- RICH2022, R. Preghenella, [A SiPM-based optical readout system for the EIC dual-radiator RICH](#)
- RICH2022, C. Chatterjee, [Simulation studies related to the particle identification by the forward and backward RICH detectors at Electron Ion Collider](#)
- SIF2021, N. Rubini, SiPM response to radiation damage and annealing treatment for the EIC dual-radiator RICH
- NSTAR2022, P. Antonioli, [Physics at the EIC](#)
- CPAD2022, P. Antonioli, [R&D studies forward a SiPM based readout for the forward RICH at EPIC experiment](#)



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