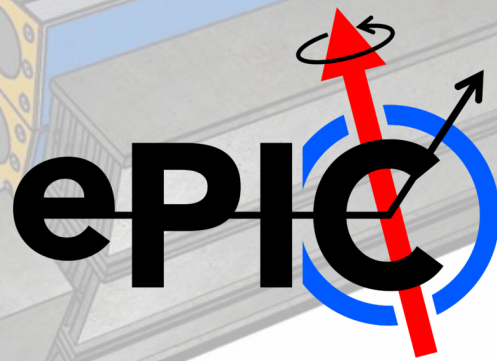


A detailed 3D cutaway diagram of the ePIC detector. The detector is cylindrical and contains several concentric layers of components. The outermost layer is a blue segmented structure. Inside, there are green and yellow layers, followed by a central region with a grid-like structure. The diagram shows the complex internal geometry and the arrangement of various detector components.

# Status of the ePIC Collaboration

*J. Lajoie, S. Dalla Torre*

July 24, 2024





# Welcome to Argonne!



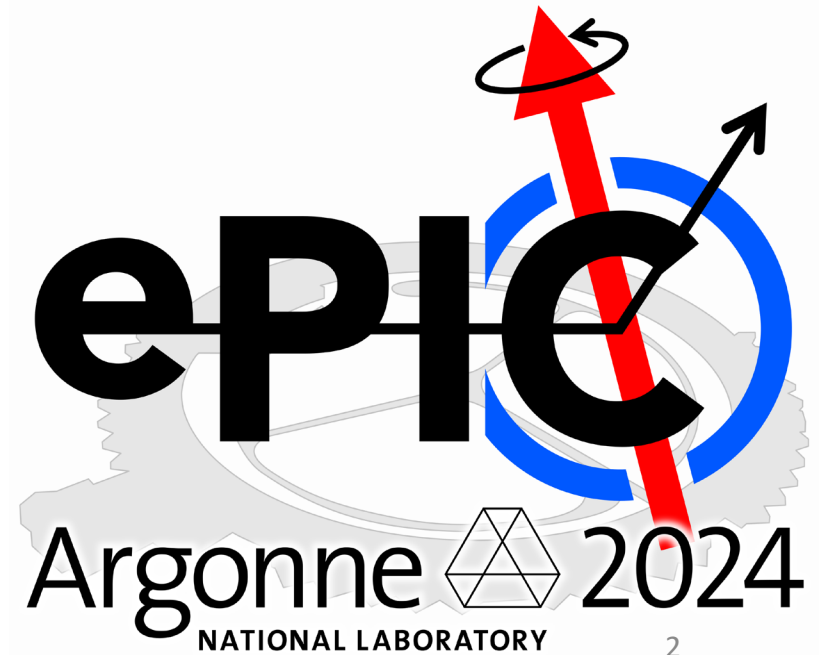
*Thanks to our hosts for this wonderful venue and support!*

7/24/2024

EICUG/ePIC Joint Session



**Argonne**  
NATIONAL  
LABORATORY





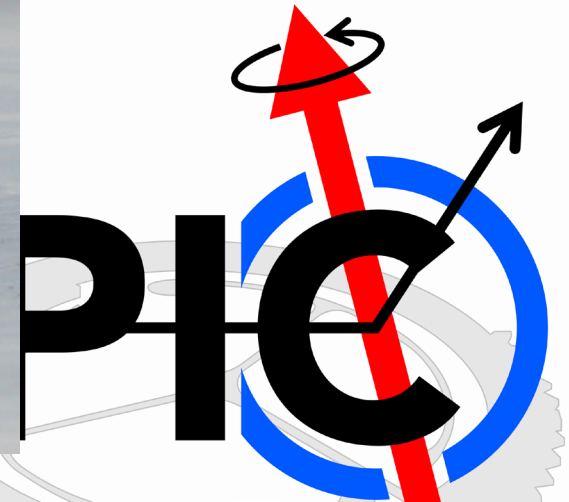
# Welcome to Argonne!



Argonne  
NATIONAL  
LABORATORY



*Wonderful venue and support!*

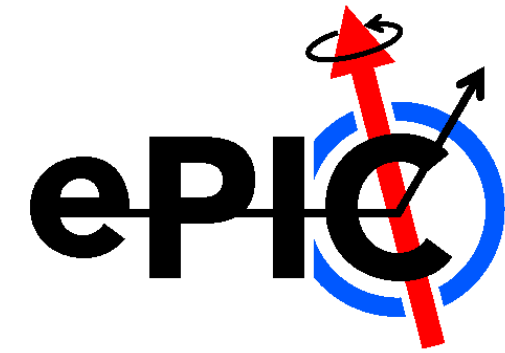


Argonne  2024  
NATIONAL LABORATORY

7/24/2024

EICUG/ePIC Joint Session

# Welcome to Lehigh!



- Lehigh University  
Bethlehem, PA
- July 22-27
- Jointly organized with  
the EICUG
- ePIC Meeting  
July 24-27<sup>th</sup>

<https://indico.bnl.gov/event/20727/>

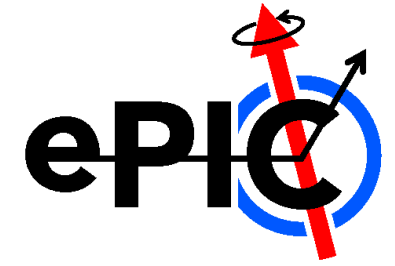


# Welcome to Lehigh!



[https://indico.bnl](https://indico.bnl.gov)

# From there to here 2024...



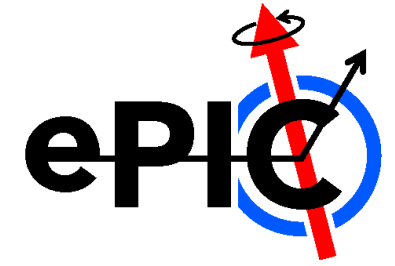
Argonne  
Collab. Mtg.  
Jan 2024

Lehigh  
Collab. Mtg.  
July 2024

2024

2025

# From there to here 2024...



Argonne  
Collab. Mtg.  
Jan 2024

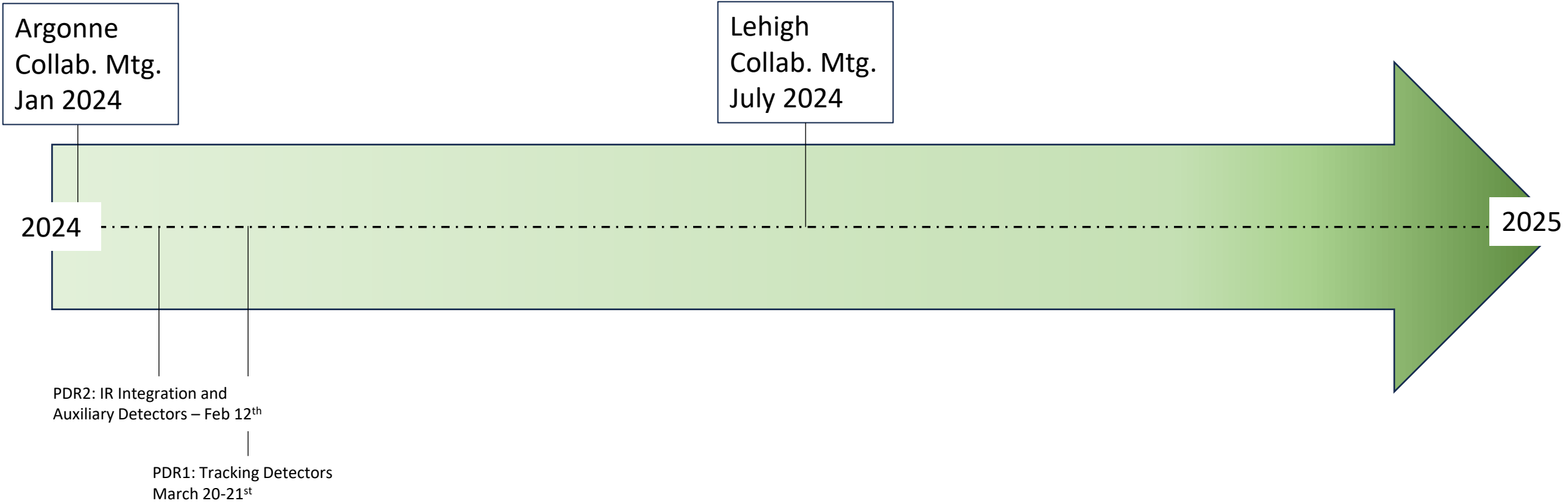
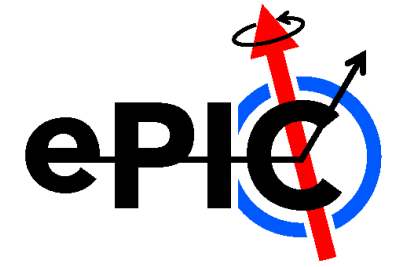
Lehigh  
Collab. Mtg.  
July 2024

2024

2025

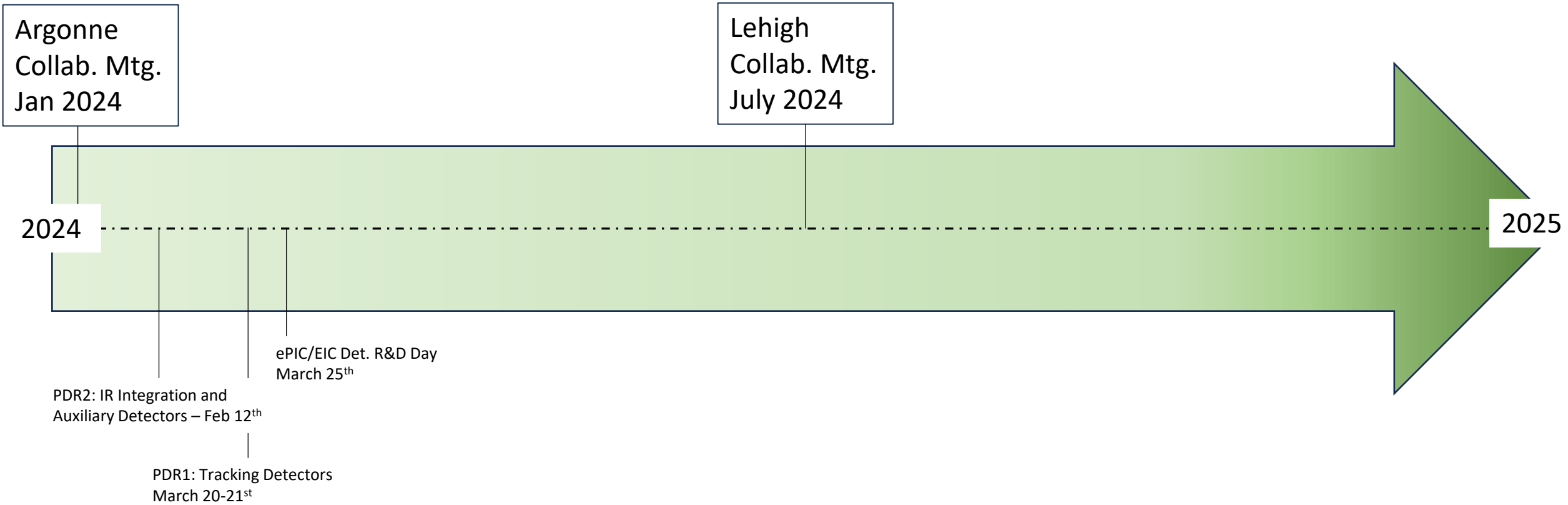
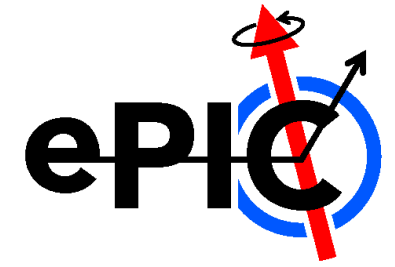
PDR2: IR Integration and  
Auxiliary Detectors – Feb 12<sup>th</sup>

# From there to here 2024...

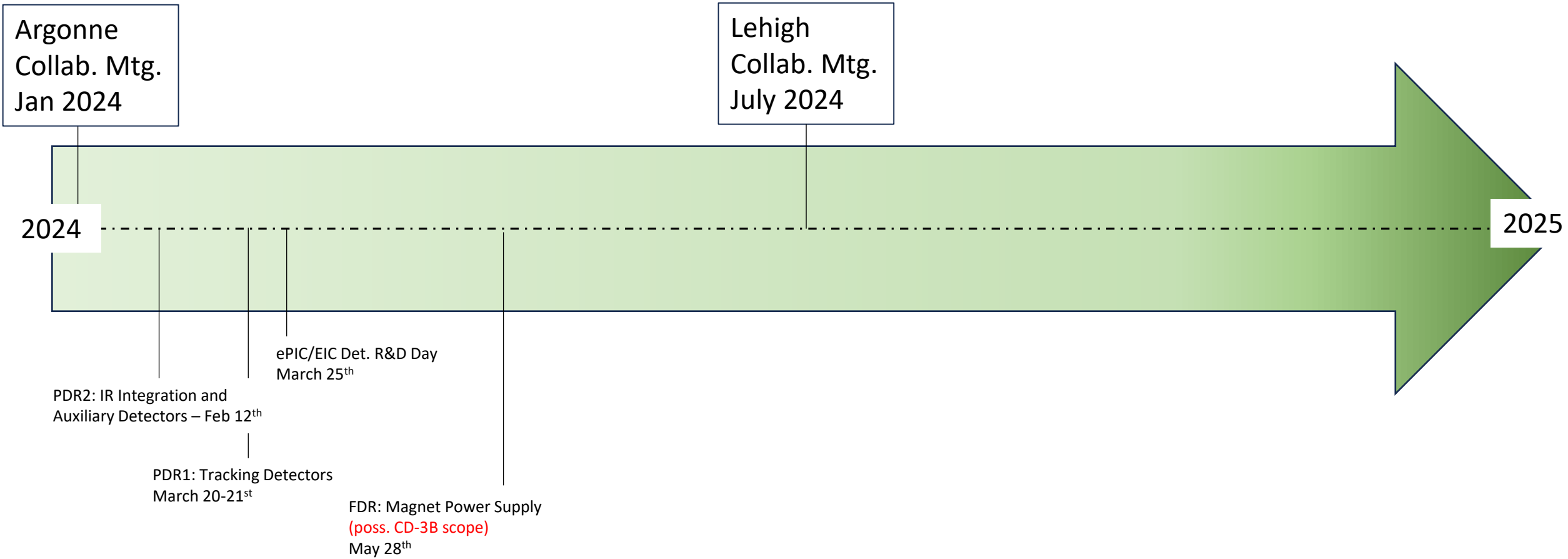
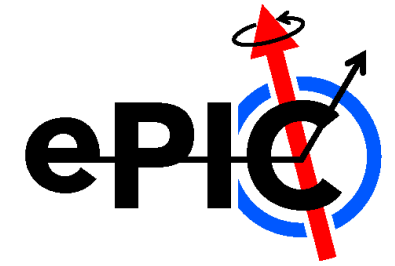




# From there to here 2024...

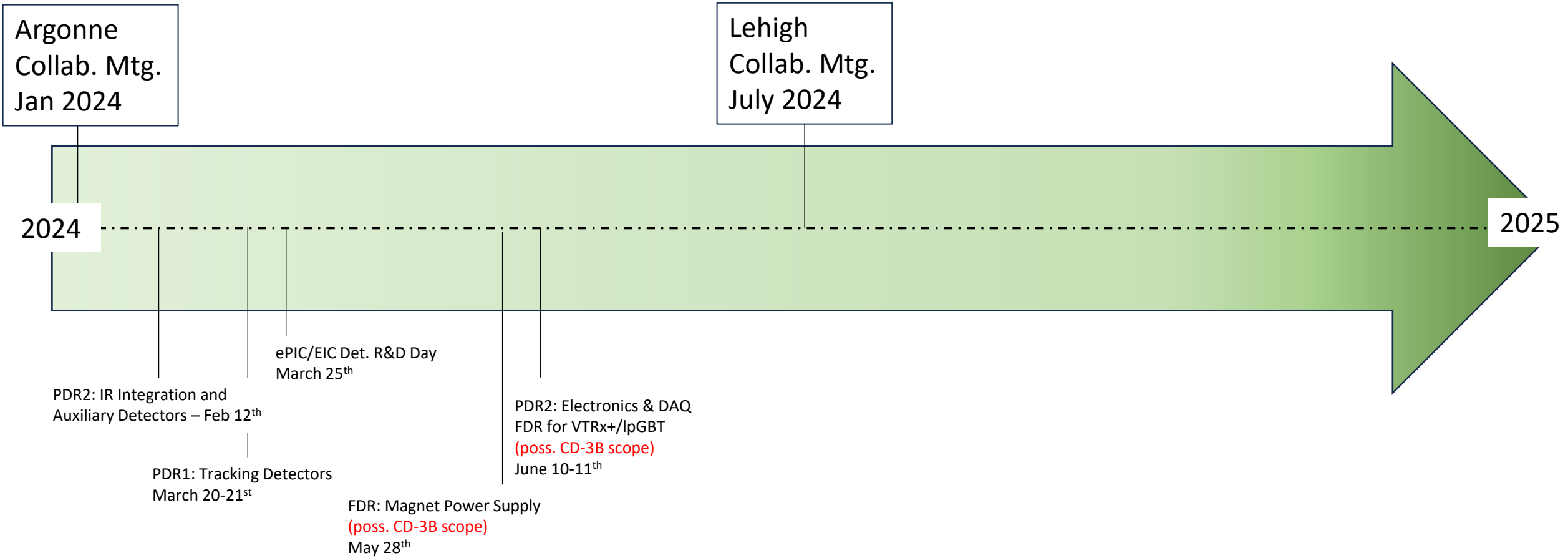
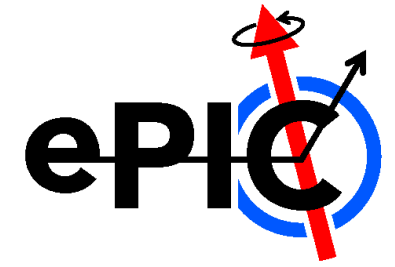


# From there to here 2024...

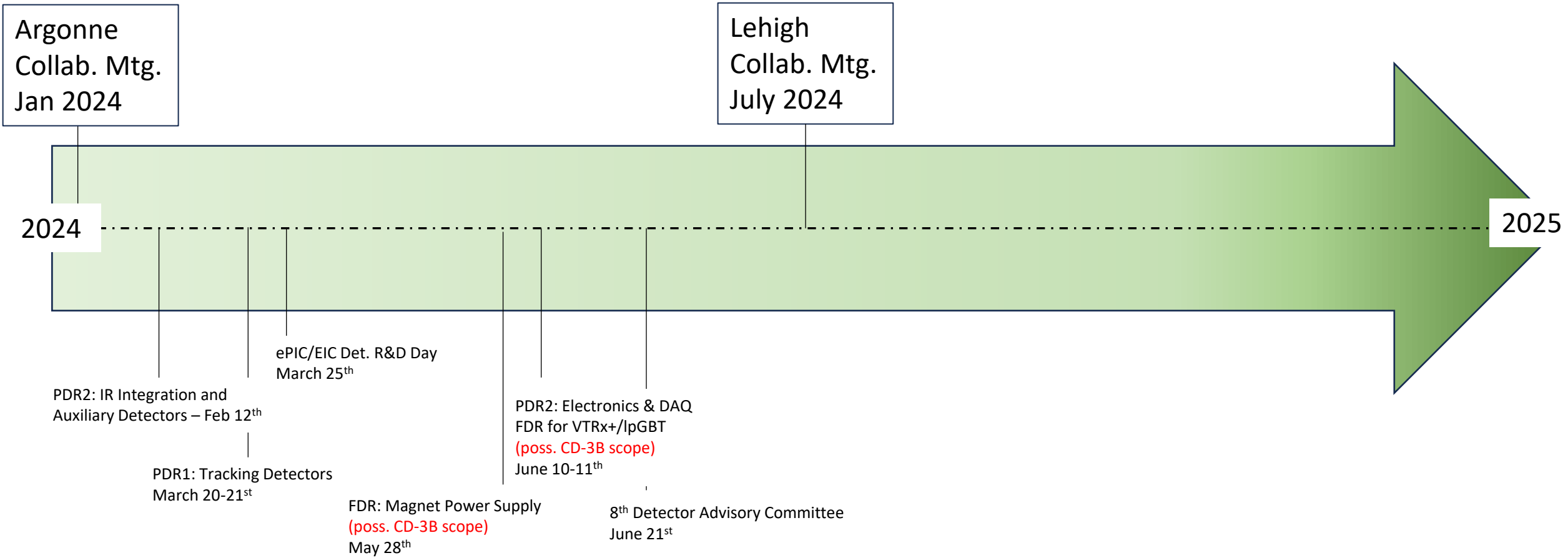
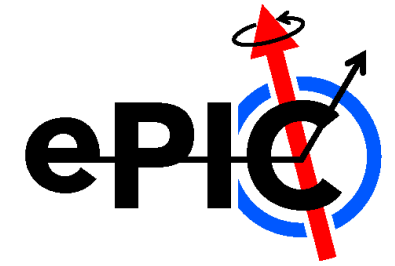




# From there to here 2024...

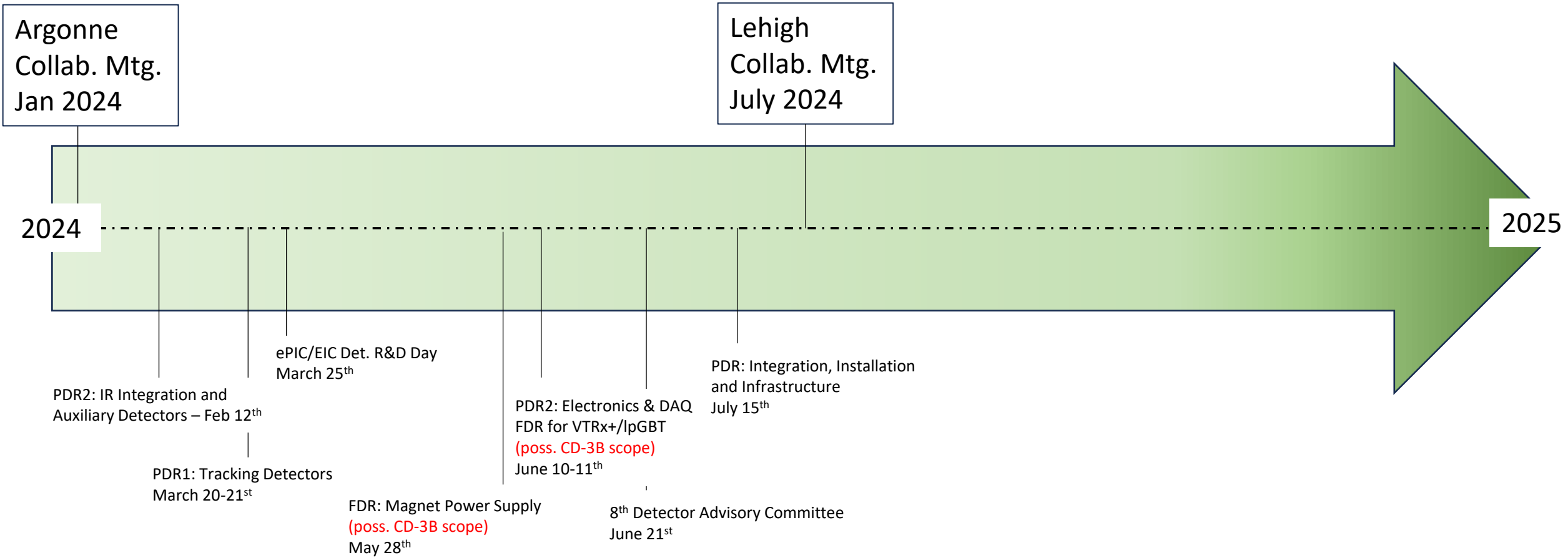
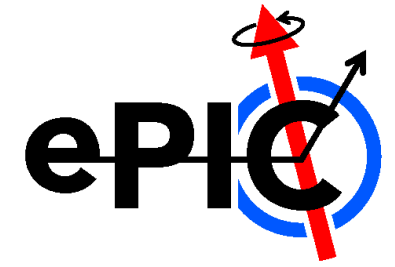


# From there to here 2024...

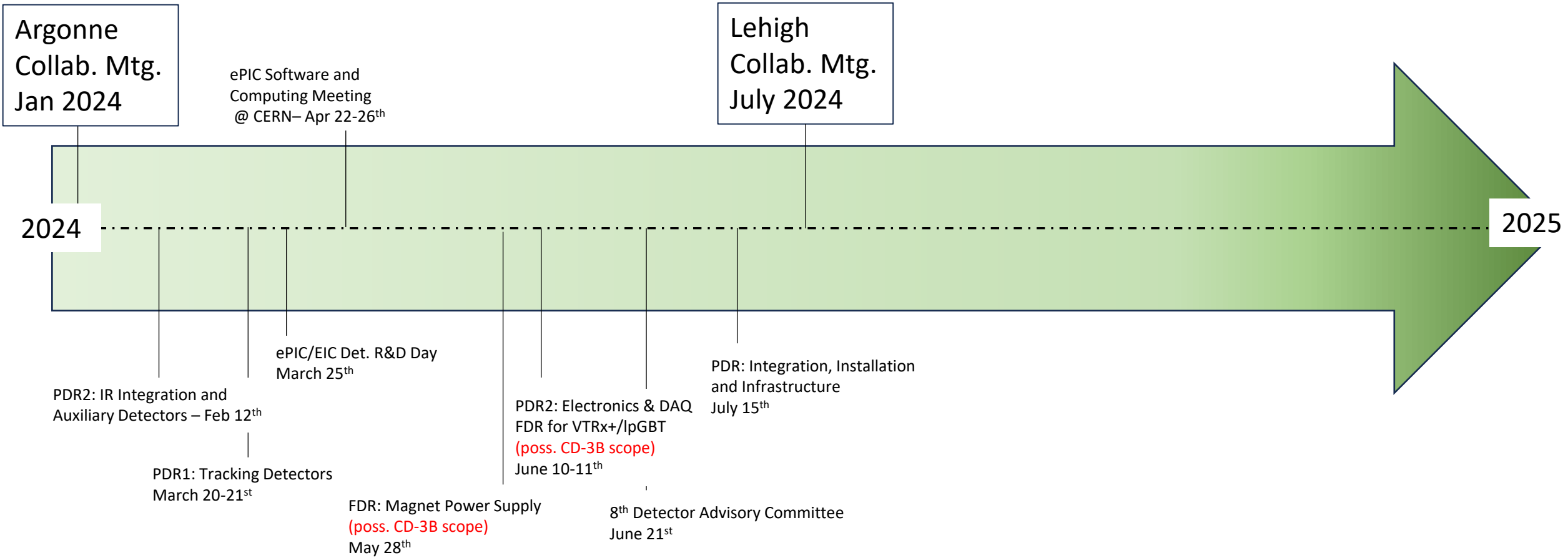
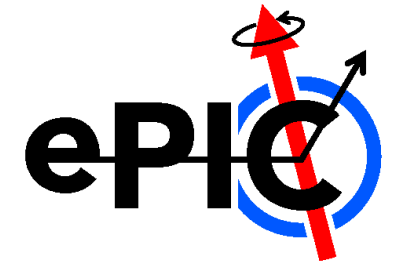




# From there to here 2024...

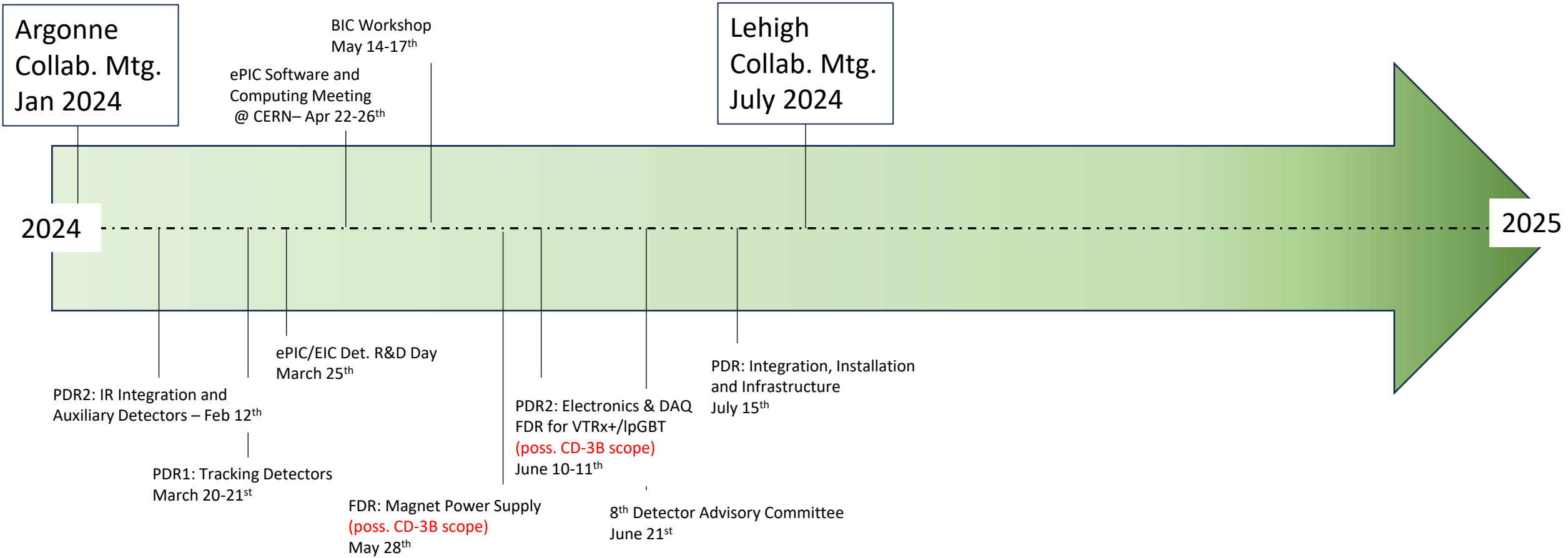
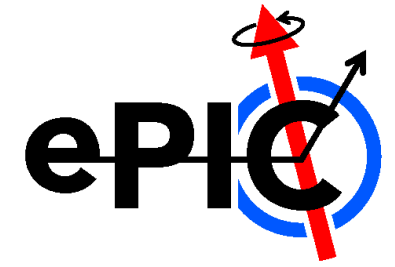


# From there to here 2024...

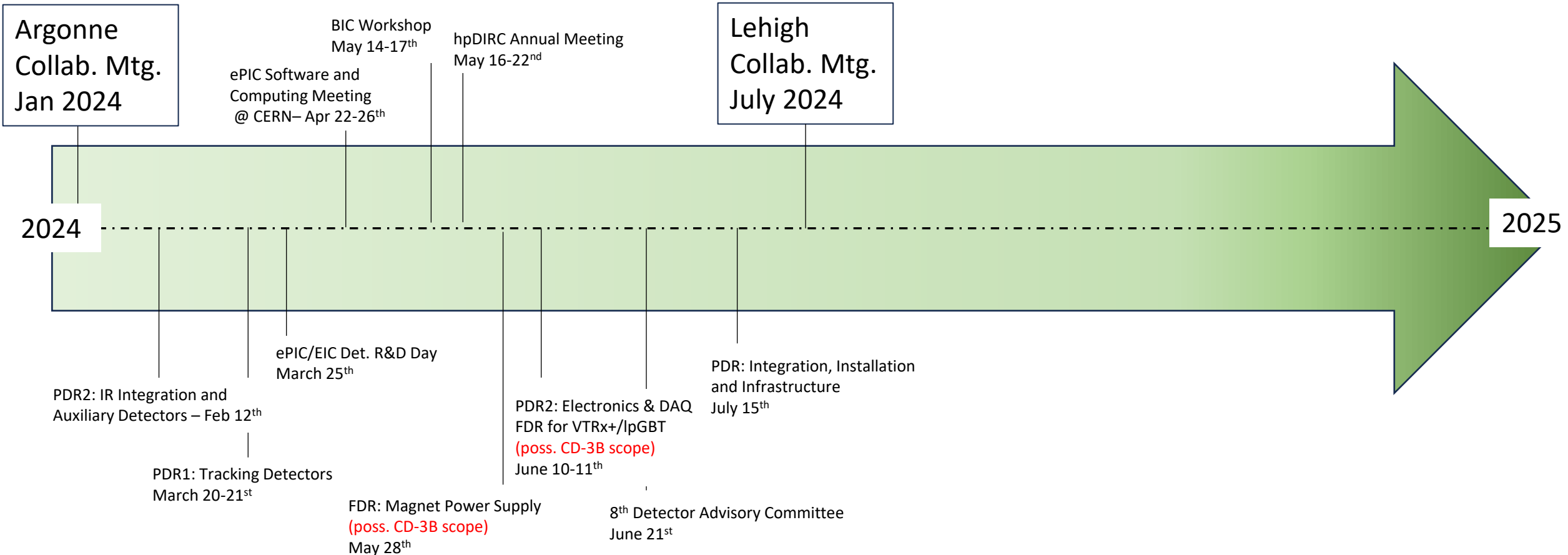
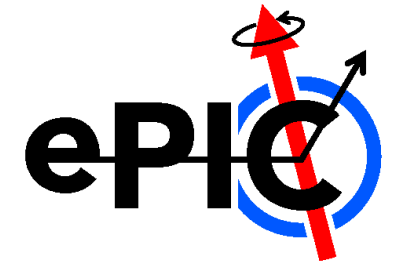




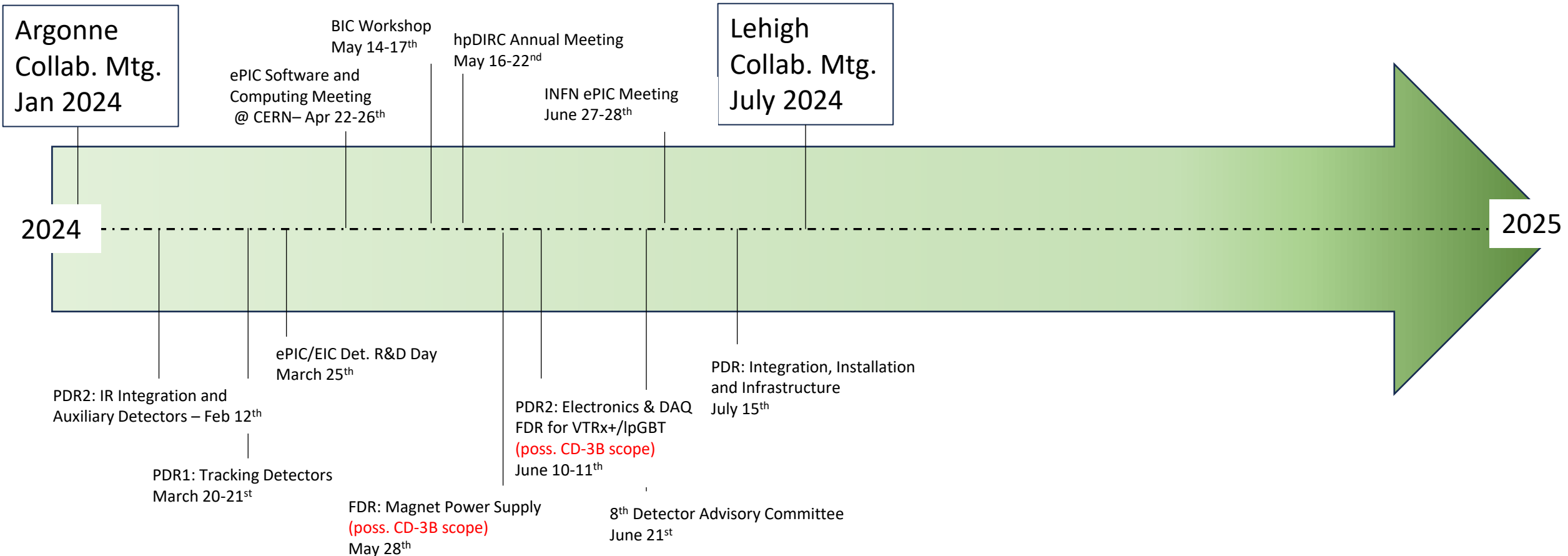
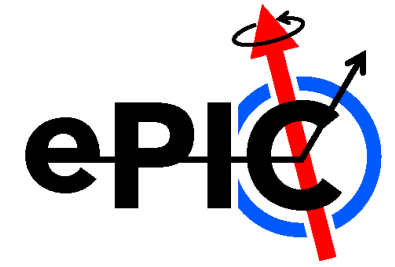
# From there to here 2024...



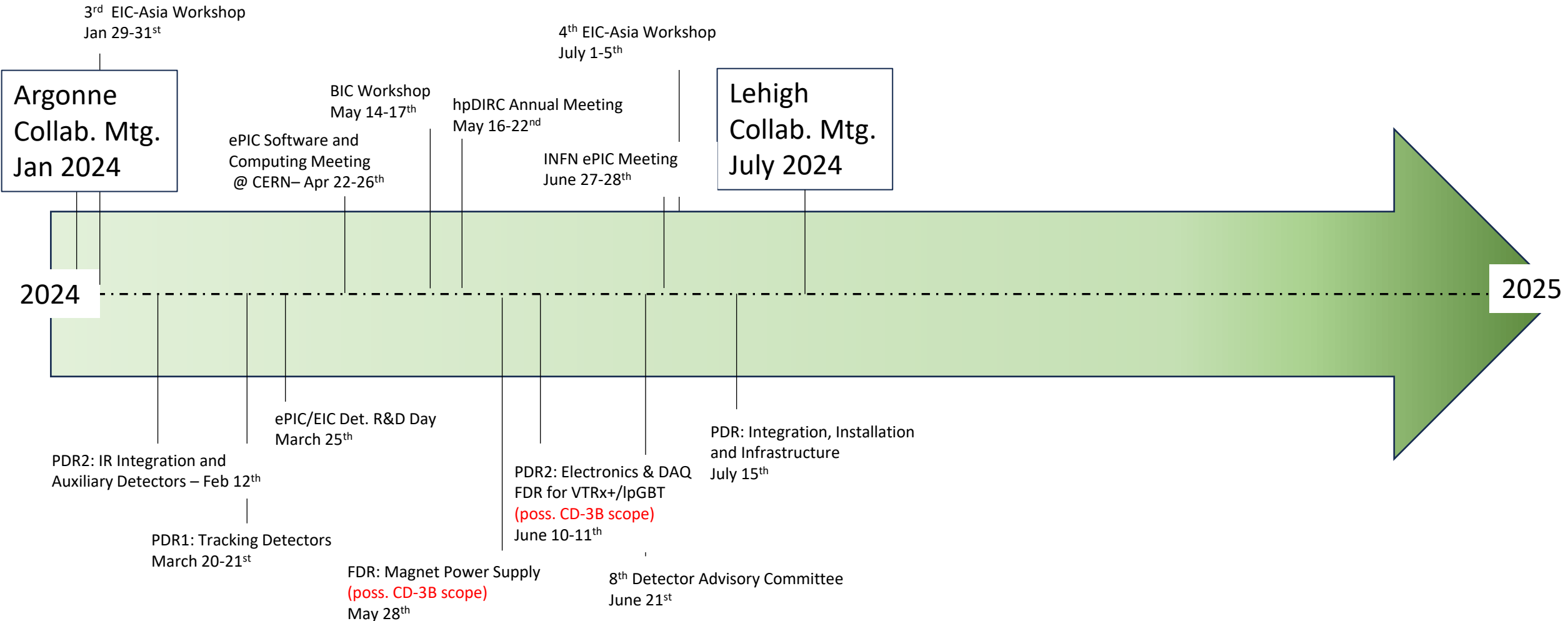
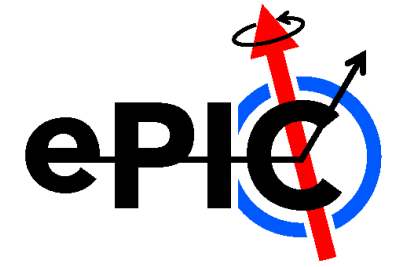
# From there to here 2024...



# From there to here 2024...

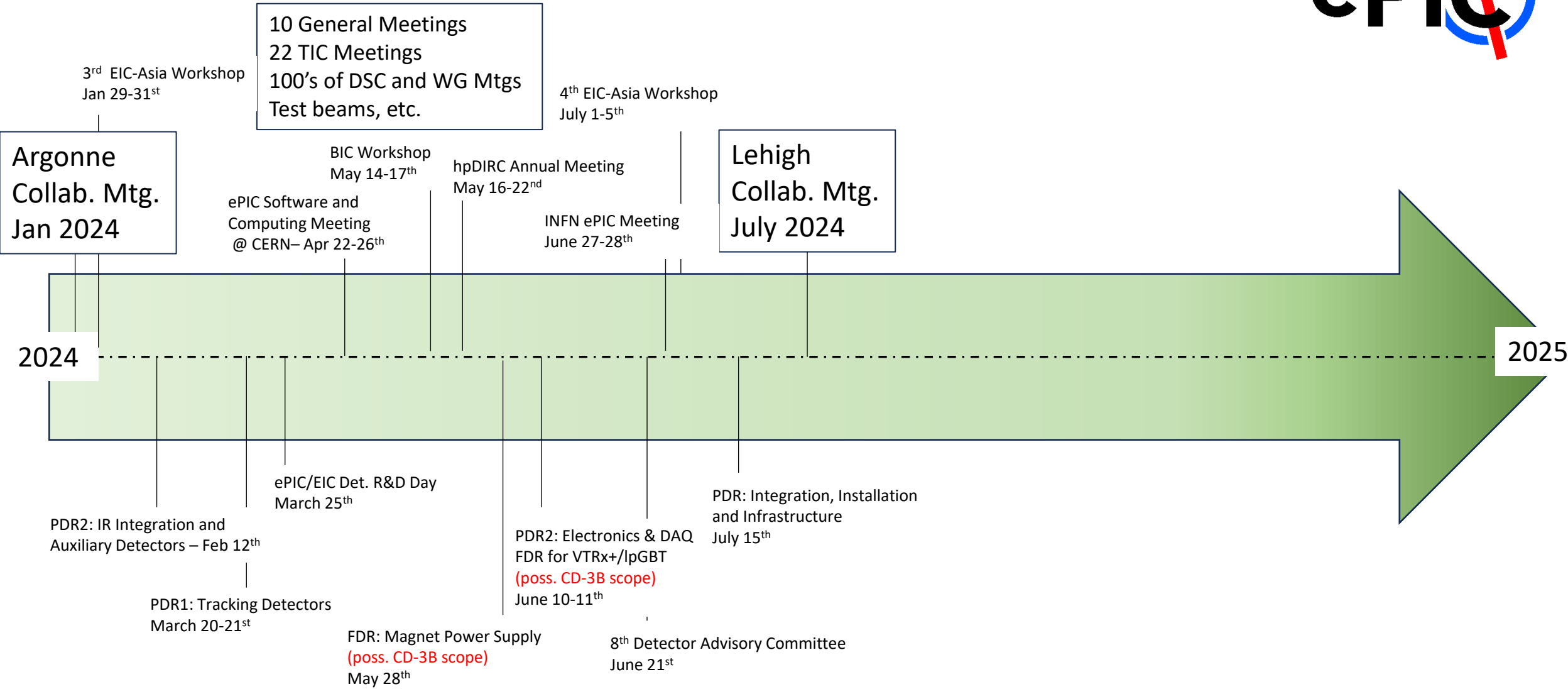
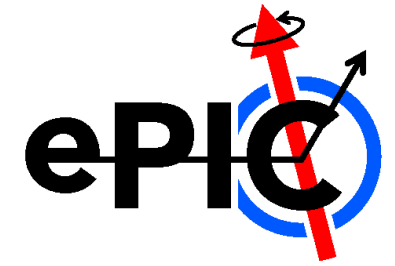


# From there to here 2024...





# From there to here 2024...



# The Collaboration

# The ePIC Collaboration

JLab, Jan. 2023



ePIC is a community of scientists dedicated to realizing the EIC science mission.

The ePIC Collaboration is as unique as the ePIC detector.



# The ePIC Collaboration

Warsaw, July 2023

JLab, Jan. 2023



ePIC is a community of scientists dedicated to realizing the EIC science mission.

The ePIC Collaboration is as unique as the ePIC detector./24/2024



# The ePIC Collaboration

Warsaw, July 2023

JLab, Jan. 2023



ANL,  
Jan. 2024



ePIC is a community of scientists dedicated to realizing the EIC science mission.

The ePIC Collaboration is as unique as the ePIC detector. /24/2024



# The ePIC Collaboration

Warsaw, July 2023

JLab, Jan. 2023



EICUG/ePIC Meeting – Lehigh, July 2024

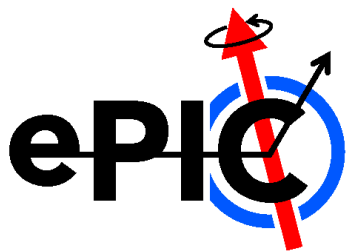
ePIC  
scie  
real  
mis.

The ePIC Collaboration is  
as unique as the ePIC  
detector./24/2024



EICUG/ePIC Joint Session





# By the numbers...

ePIC Initiated in July 2022

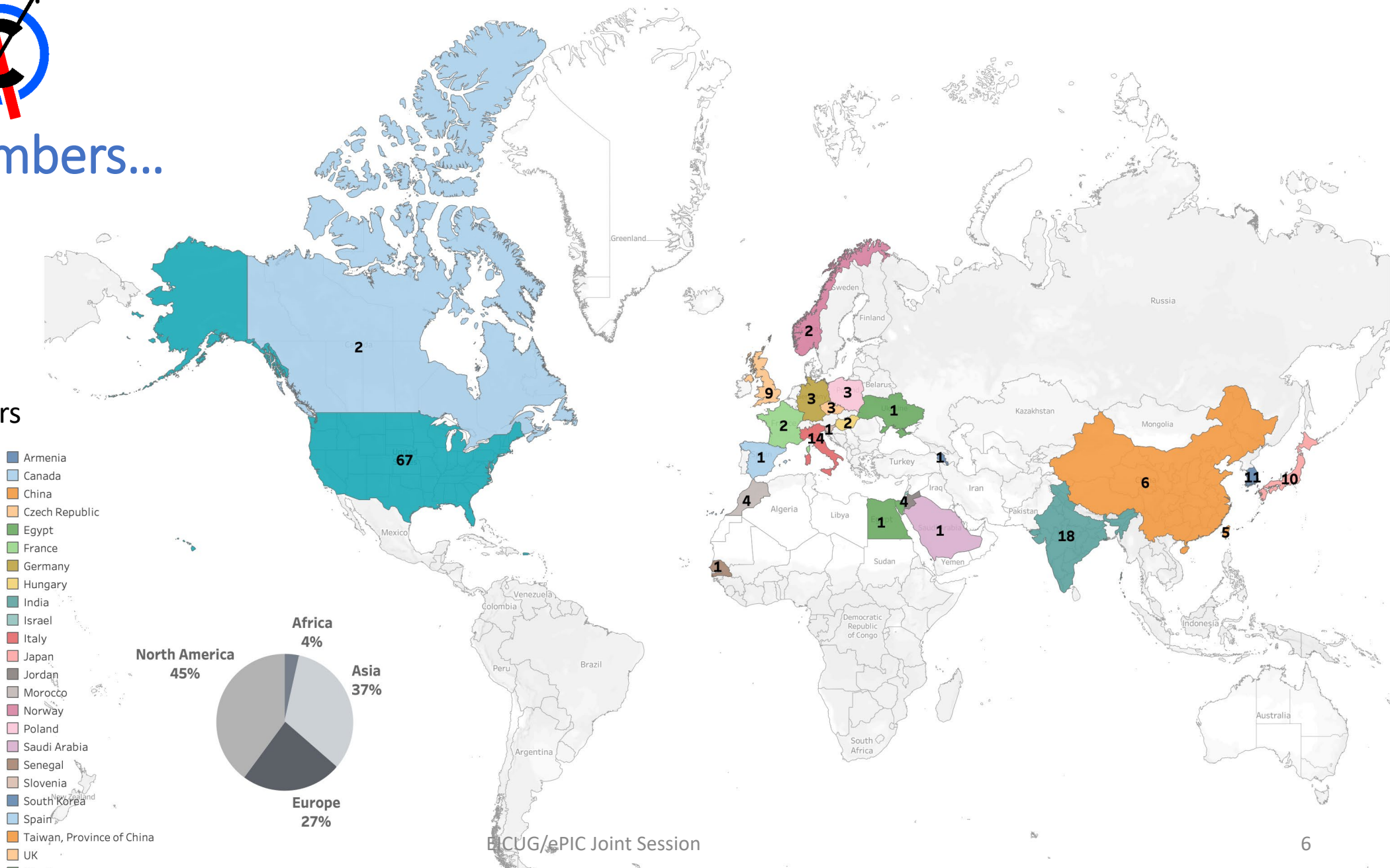
Currently:  
>850 collaborators  
(from 2024 Institutional Survey)

>650 members active in ePIC activities

ePIC Institutions  
173

ePIC Countries  
25

ePIC World Region  
4



7/24/2024

ECUG/ePIC Joint Session

6



## New Institutions Joining ePIC in 2024:

• Univ. of Texas at Austin



• Univ. Mohammed V in Rabat



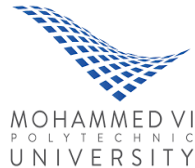
• Univ. Ibn Tofail in Kénitra



• Univ. Mohammed Premier in Oujda



• Univ. Mohammed VI in Bengurir



• Kent State Univ.



• Laboratoire Leprince-Ringuet (LLR)



• American University in Cairo



• Central University of Haryana



• Indian Institute of Technology Mandi







## New Institutions Joining ePIC in 2024:

• Univ. of Texas at Austin



• Kent State Univ.



### Two new petitions to join ePIC at Thursday's CC Meeting:

• University of Petroleum and Energy Studies (India)



• Tohoku University (Japan)



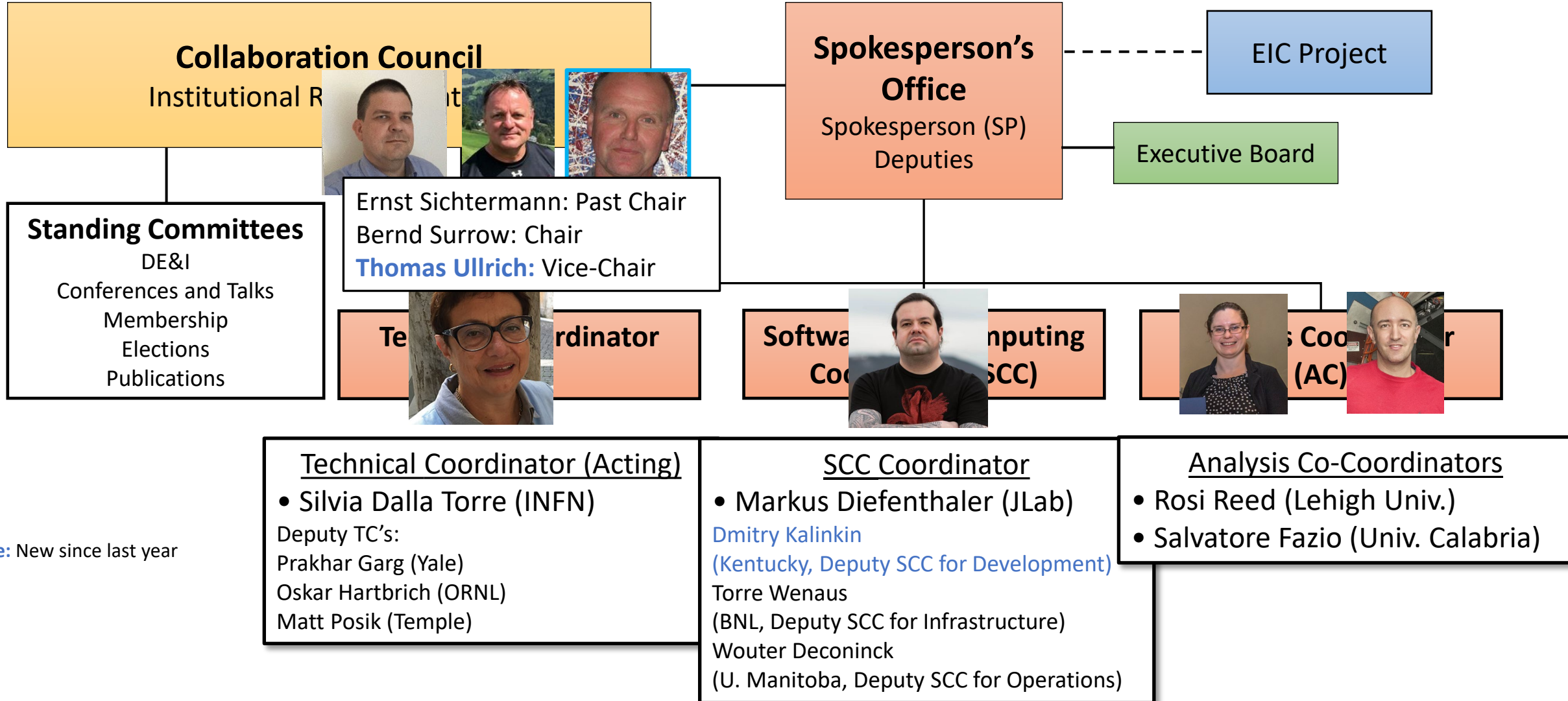
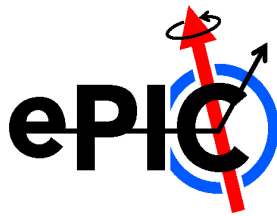
• Univ. Mohammed VI  
in Bengurir



• Indian Institute of  
Technology Mandi



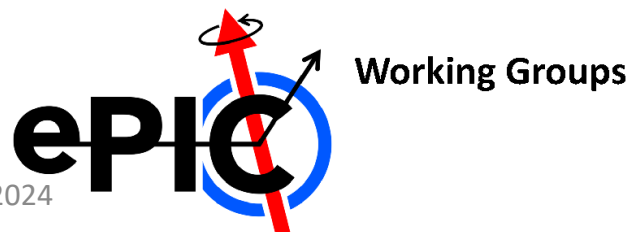
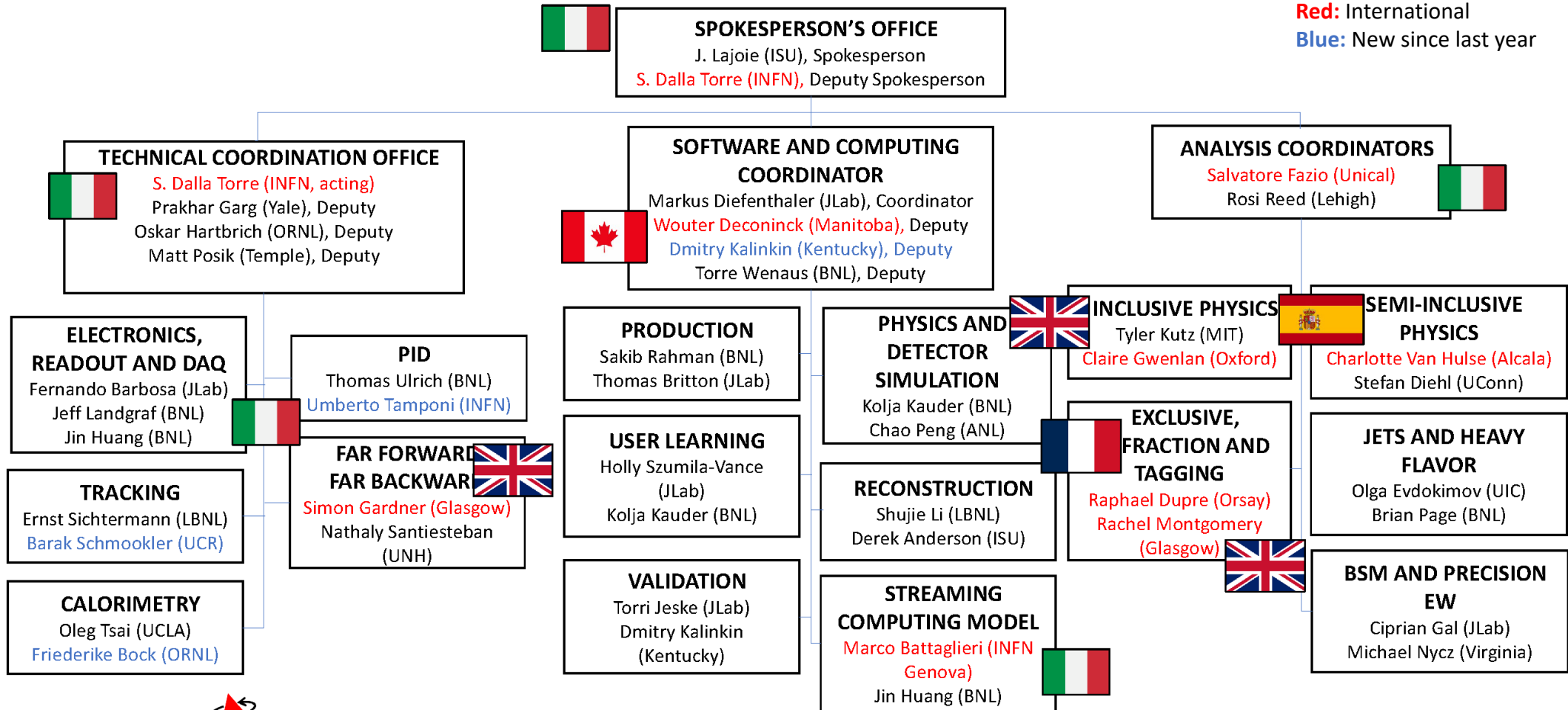
# ePIC Collaboration Structure



Blue: New since last year

# ePIC Working Group Structure

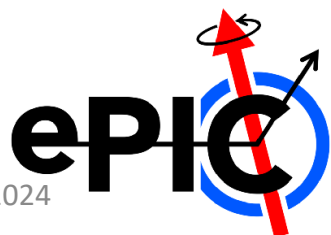
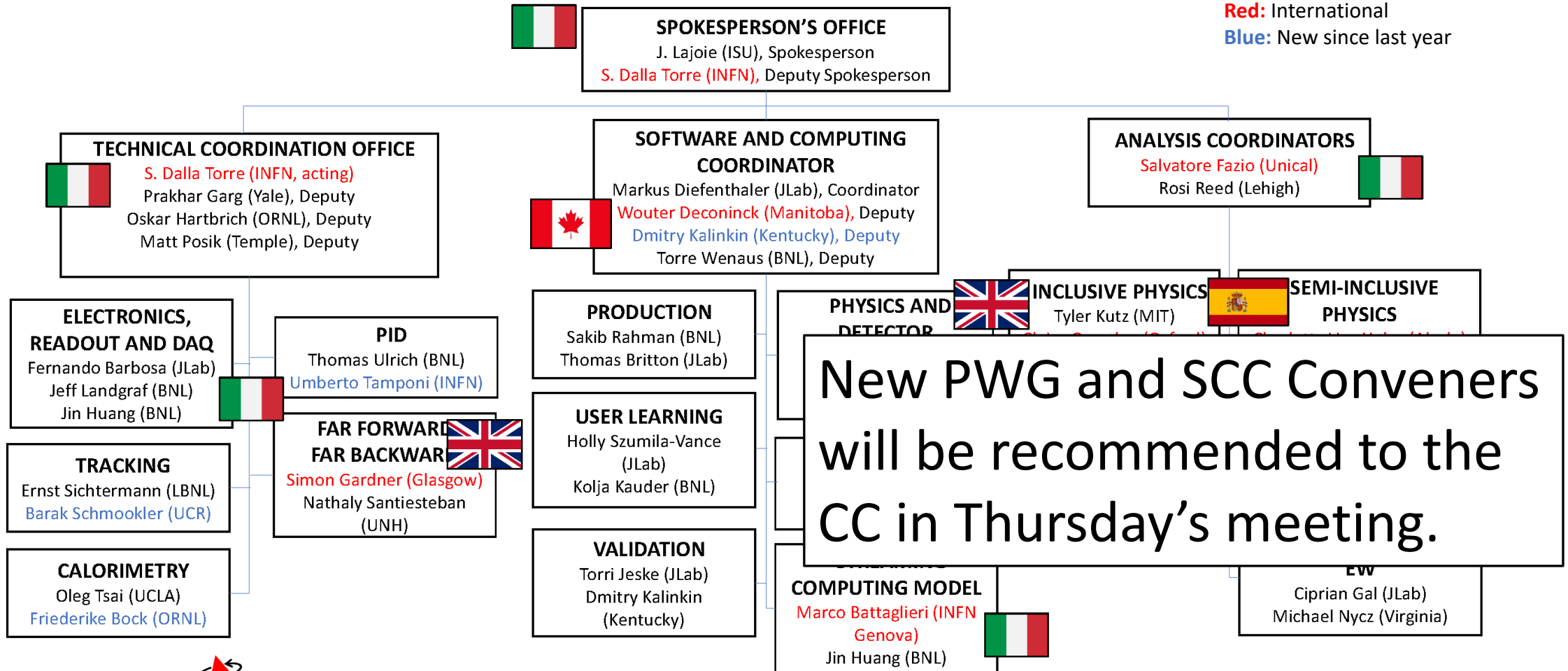
**Red:** International  
**Blue:** New since last year





# ePIC Working Group Structure

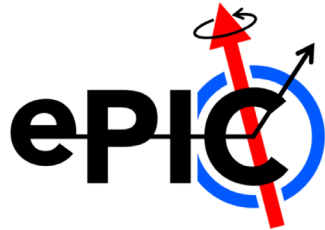
**Red:** International  
**Blue:** New since last year



Working Groups

# ePIC DSC Structure

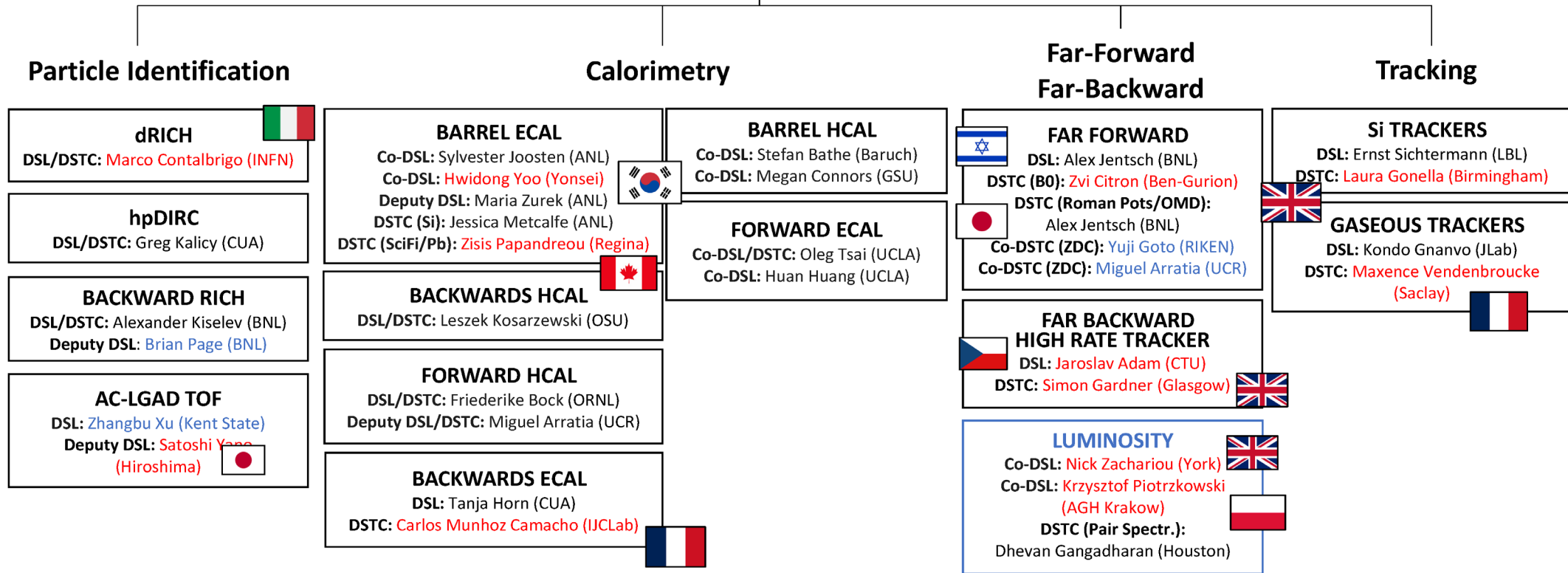
**Red:** International  
**Blue:** New since last year



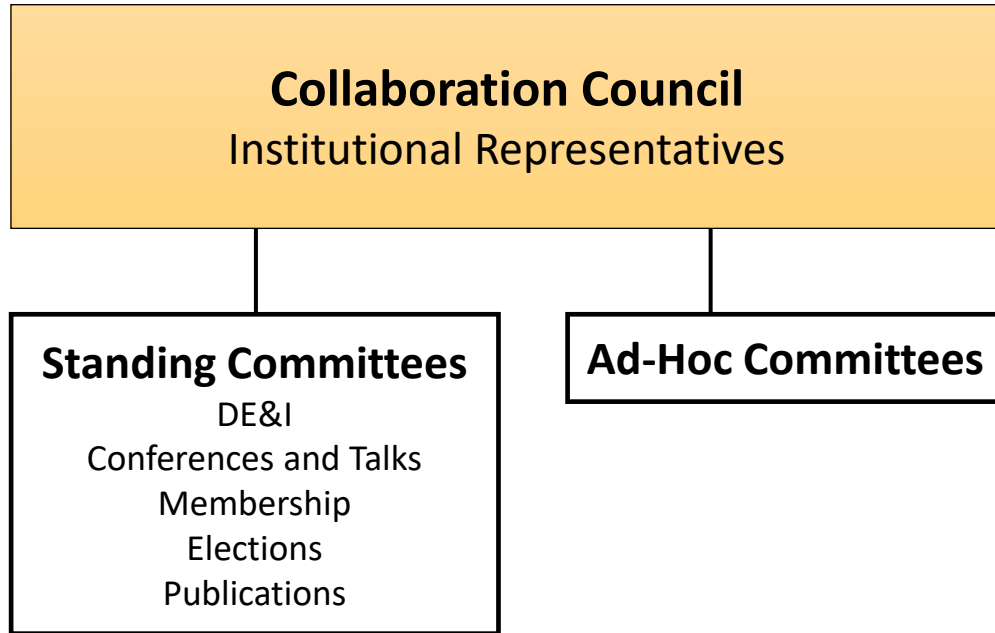
**SPOKESPERSON'S OFFICE**  
 J. Lajoie (ORNL), Spokesperson  
 S. Dalla Torre (INFN), Deputy Spokesperson

**TECHNICAL COORDINATION OFFICE**  
 Silvia Dalla Torre (INFN, acting)  
 Prakhar Garg (Yale), Deputy  
 Oskar Hartbrich (ORNL), Deputy  
 Matt Posik (Temple), Deputy

## Detector Subsystem Collaborations



# ePIC Committees





# ePIC Committees

## DE&I Committee:

Chair: Megan Connors (GSU)

Vice-Chair: Christine Nattrass (UTK)

Francesco Bossù (CEA-Saclay), Wouter Deconinck (University of Manitoba), Narbe Kalantarians (Virginia Union University), Iris Ponce Pinto (Yale University), Maya Shimomura (Nara Women's University), Allison Zec (University of New Hampshire)



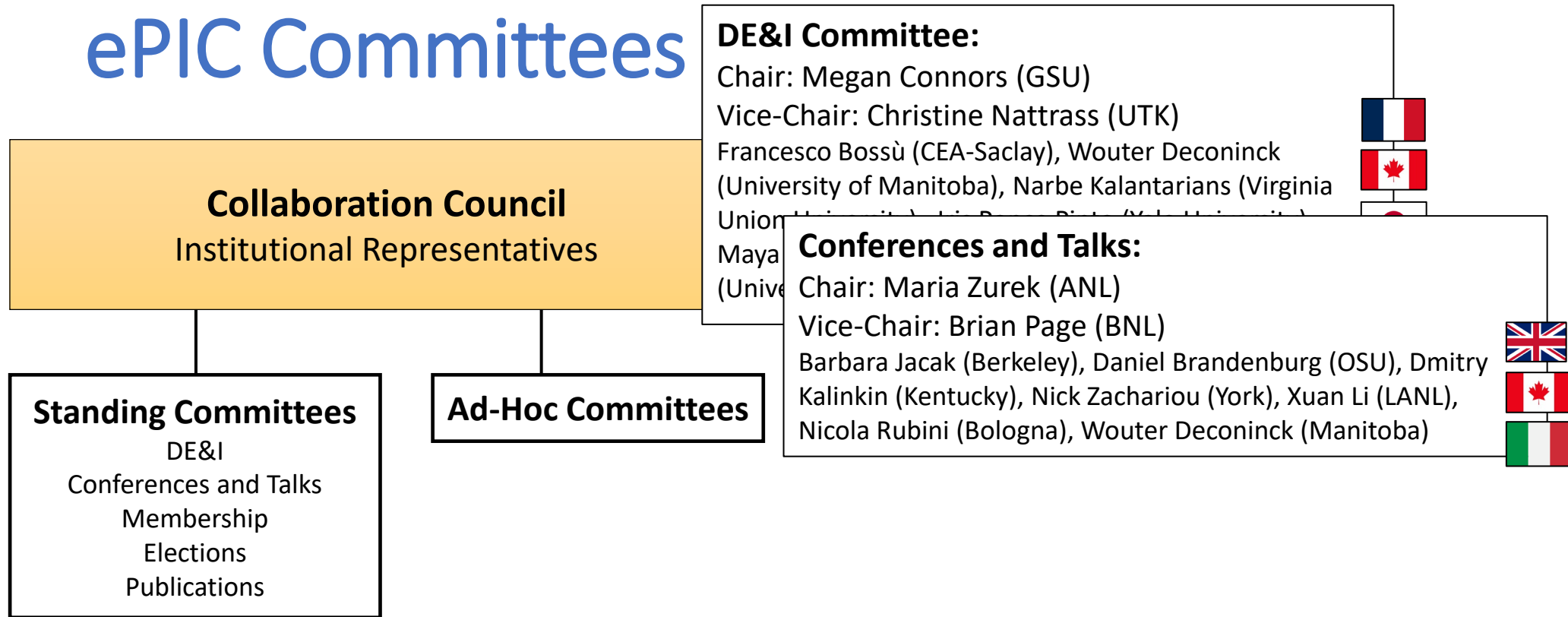
**Collaboration Council**  
Institutional Representatives

## Standing Committees

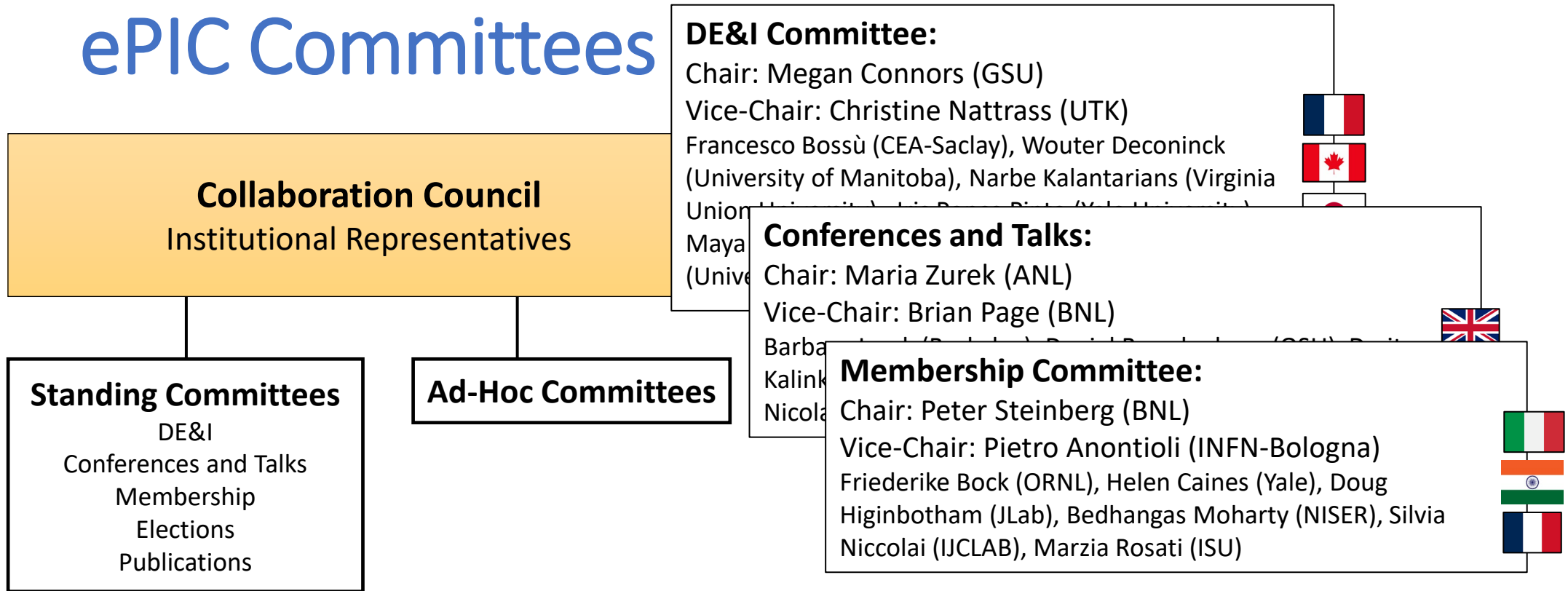
DE&I  
Conferences and Talks  
Membership  
Elections  
Publications

## Ad-Hoc Committees

# ePIC Committees

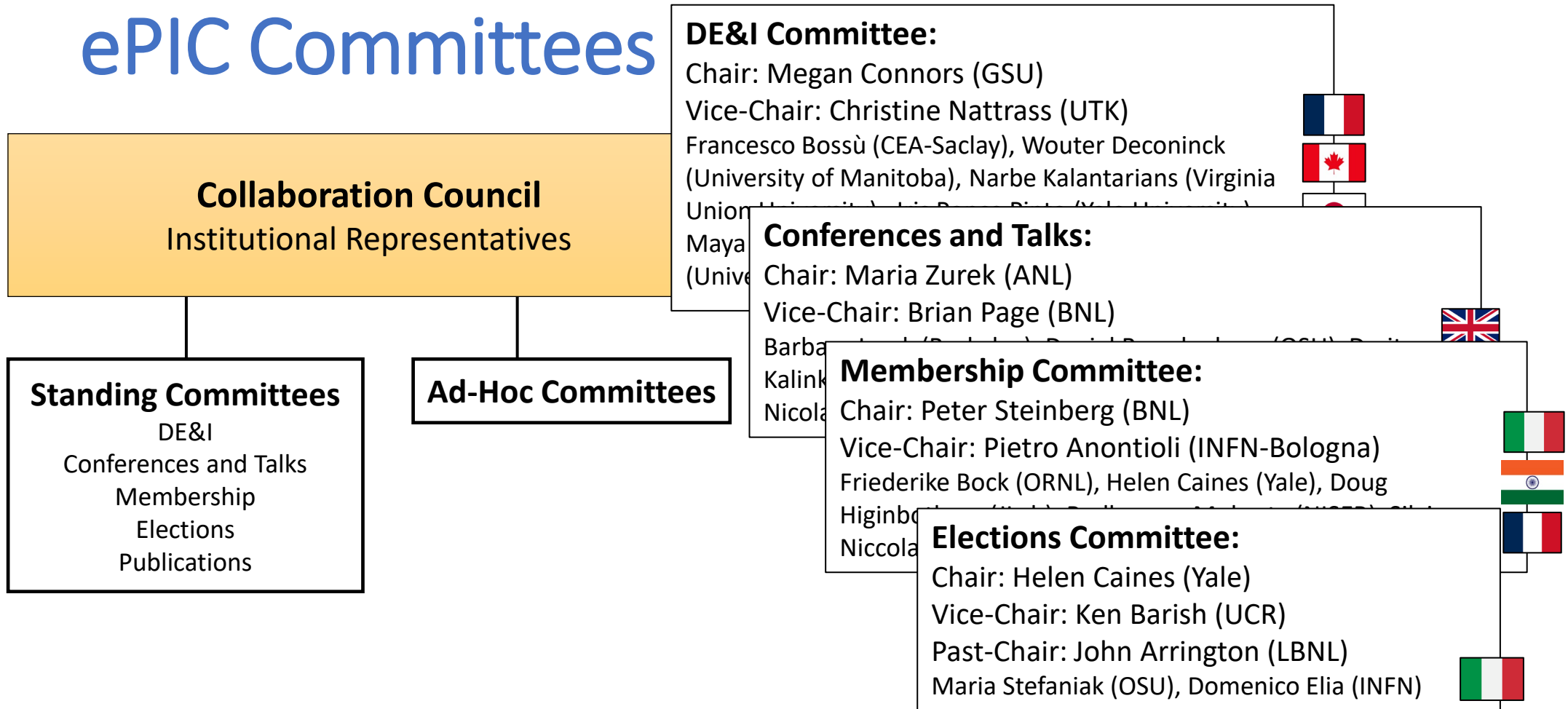


# ePIC Committees

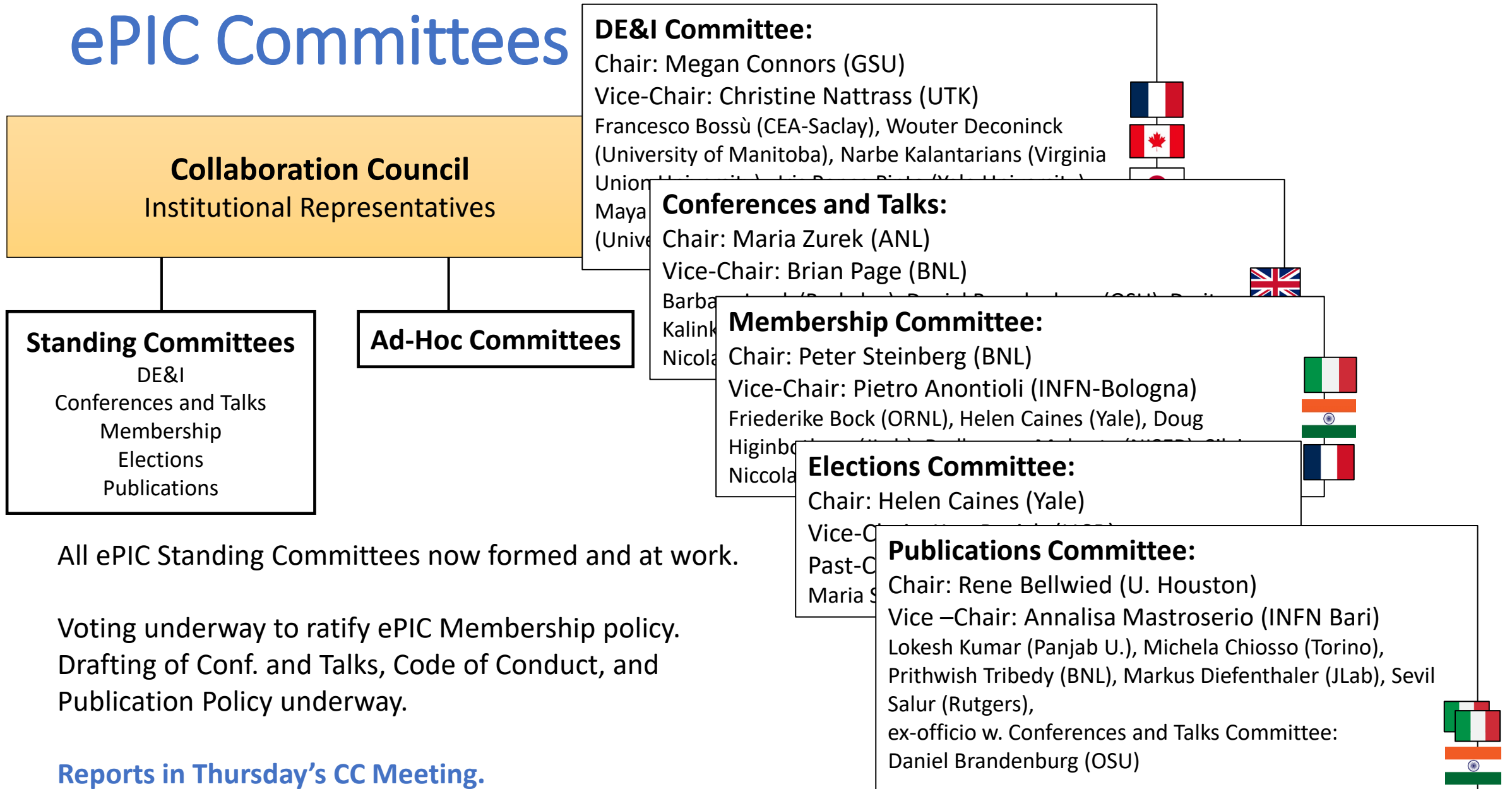




# ePIC Committees



# ePIC Committees



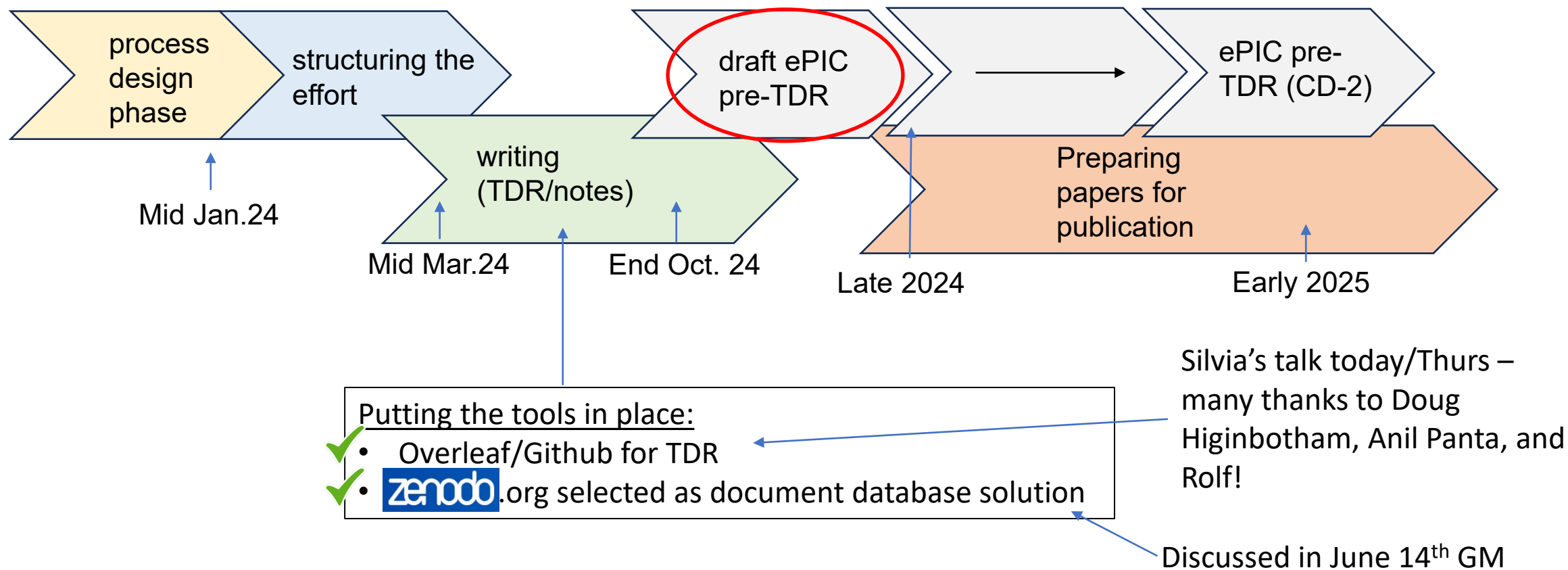
All ePIC Standing Committees now formed and at work.

Voting underway to ratify ePIC Membership policy.  
Drafting of Conf. and Talks, Code of Conduct, and  
Publication Policy underway.

**Reports in Thursday’s CC Meeting.**

# TDR/Publication Timeline

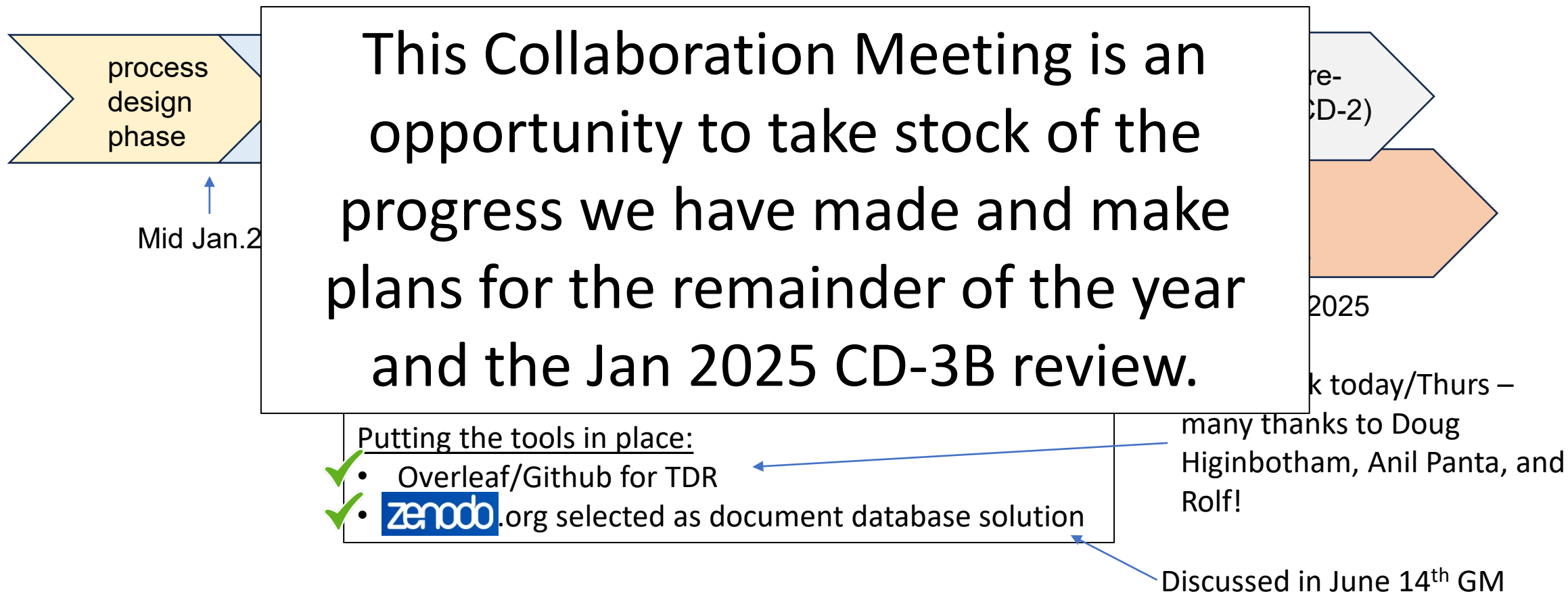
Executing the plan from the Jan. 2024 Collaboration Meeting:



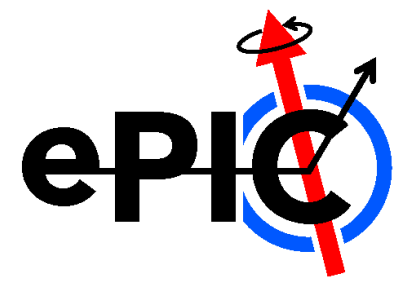


# TDR/Publication Timeline

Executing the plan from the Jan. 2024 Collaboration Meeting:



# The Three Pillars of ePIC



- **Technical Coordination**

- Develop technical design of ePIC
- Support the ePIC TDR contributions
- Facilitate technical communication with the EIC project

**Silvia Dalla Torre**

Prakhar Garg

Oskar Hartbrich

Matt Posik

- **Software & Computing Coordination**

- Software and simulation productions for TDR and beyond.
- Onboarding via landing page and targeted tutorials.
- Development of ePIC Streaming Computing Model.

**Markus Diefenthaler**

Wouter Deconinck

Dmitry Kalinkin

Torre Wenaus

- **Analysis Coordination**

- Organizing physics “benchmark” plots for the TDR
- Sets priorities for reconstruction development in conjunction with Software and Computing

**Rosi Reed**

**Salvatore Fazio**

# The Three Pillars of ePIC



- **Technical Coordination**

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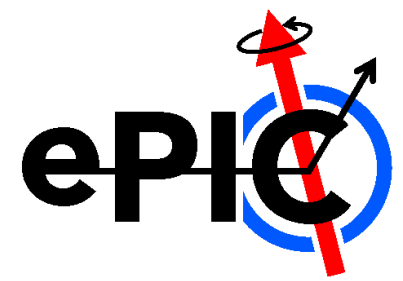
[See TC report immediately following this talk.](#)

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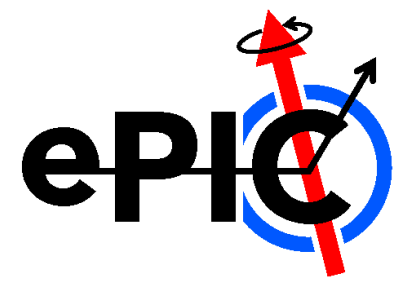


**Silvia Dalla Torre**  
Prakhar Garg  
Oskar Hartbrich  
Matt Posik

**Markus Diefenthaler**  
Wouter Deconinck  
Dmitry Kalinkin  
Torre Wenaus

**Rosi Reed**  
**Salvatore Fazio**

# The Three Pillars of ePIC



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**Silvia Dalla Torre**  
Prakhar Garg  
Oskar Hartbrich  
Matt Posik



- **Software & Computing Coordination**

- Software and simulation productions for TDR and beyond.
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- Development of ePIC Streaming Computing Model.

[See SCC report in Saturday's plenary session.](#)

**Markus Diefenthaler**  
Wouter Deconinck  
Dmitry Kalinkin  
Torre Wenaus

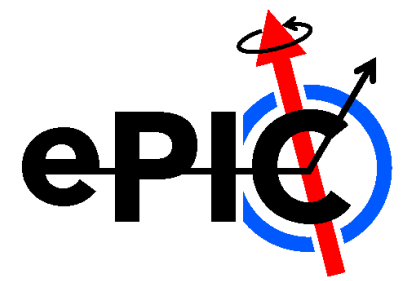
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- Organizing physics “benchmark” plots for the TDR
- Sets priorities for reconstruction development in conjunction with Software and Computing

**Rosi Reed**  
**Salvatore Fazio**



# The Three Pillars of ePIC



## • **Technical Coordination**

- Develop technical design of ePIC
- Support the ePIC TDR contributions
- Facilitate technical communication with the EIC project

[See TC report immediately following this talk.](#)

**Silvia Dalla Torre**  
Prakhar Garg  
Oskar Hartbrich  
Matt Posik



## • **Software & Computing Coordination**

- Software and simulation productions for TDR and beyond.
- Onboarding via landing page and targeted tutorials.
- Development of ePIC Streaming Computing Model.

[See SCC report in Saturday's plenary session.](#)

**Markus Diefenthaler**  
Wouter Deconinck  
Dmitry Kalinkin  
Torre Wenaus



## • **Analysis Coordination**

- Organizing physics “benchmark” plots for the TDR
- Sets priorities for reconstruction development in conjunction with Software and Computing

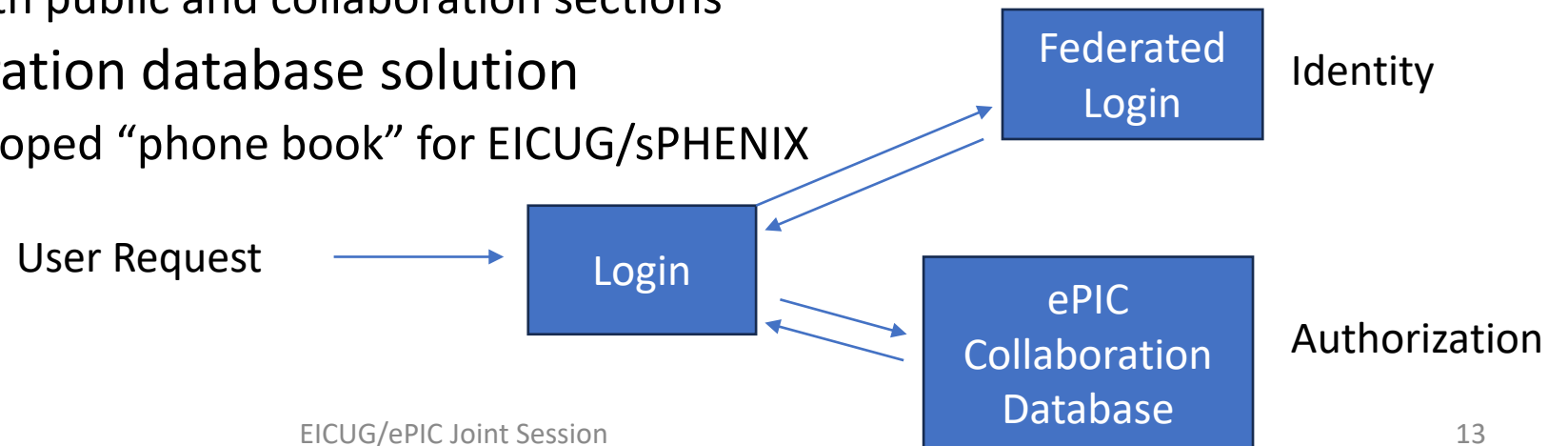
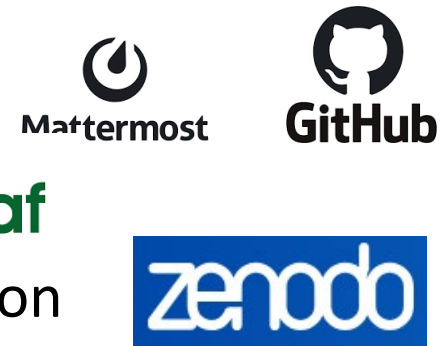
[See AC report in Saturday's plenary session.](#)

**Rosi Reed**  
**Salvatore Fazio**

# Collaborative Tools Development

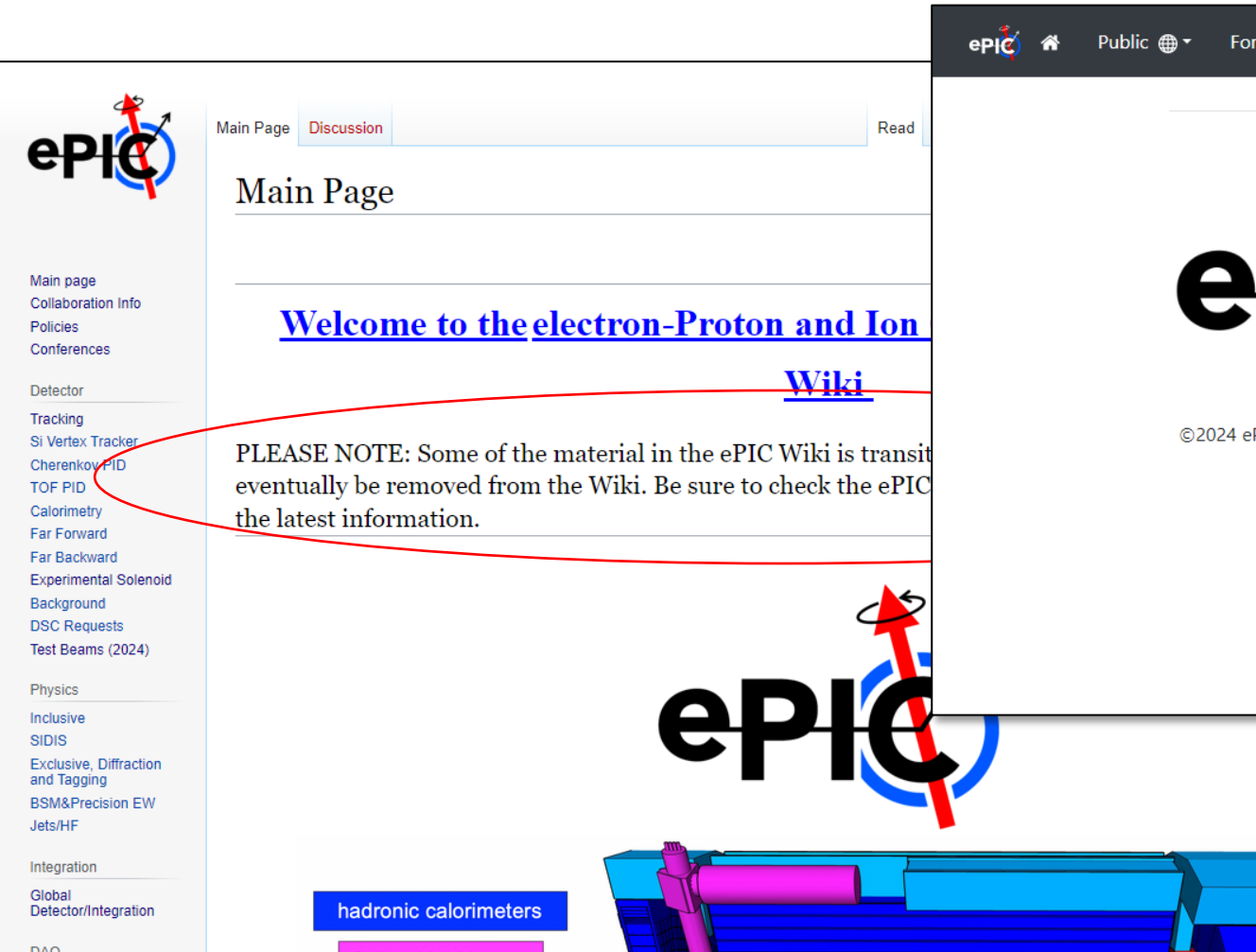
- Ad-Hoc Committee working to put together the tools we will need to support the collaboration:

- Mattermost and GitHub already in use
- Overleaf available for TDR effort
- Zenodo.org selected as document database solution
- Website under development
  - ePIC has a page under the EIC Project BNL site
  - Push to develop both public and collaboration sections
- Working on collaboration database solution
  - Based on BNL developed “phone book” for EICUG/sPHENIX

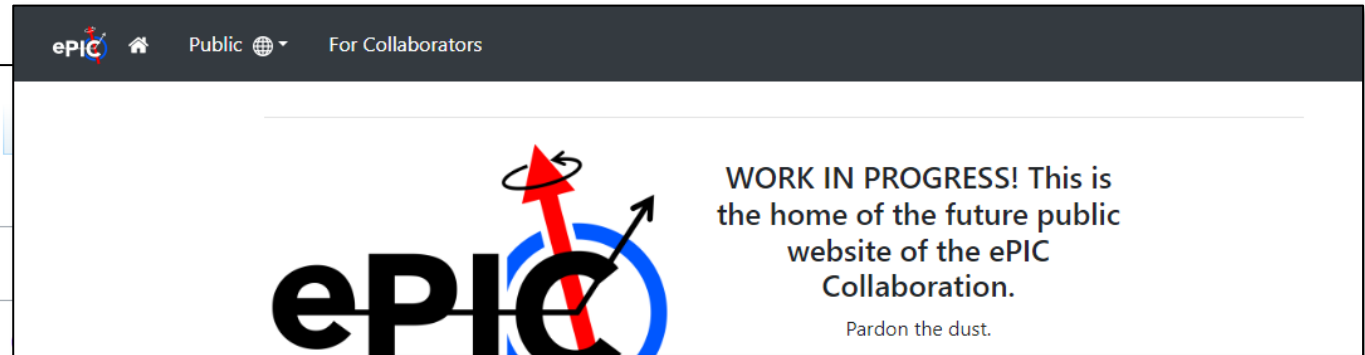


# ePIC Website Progress

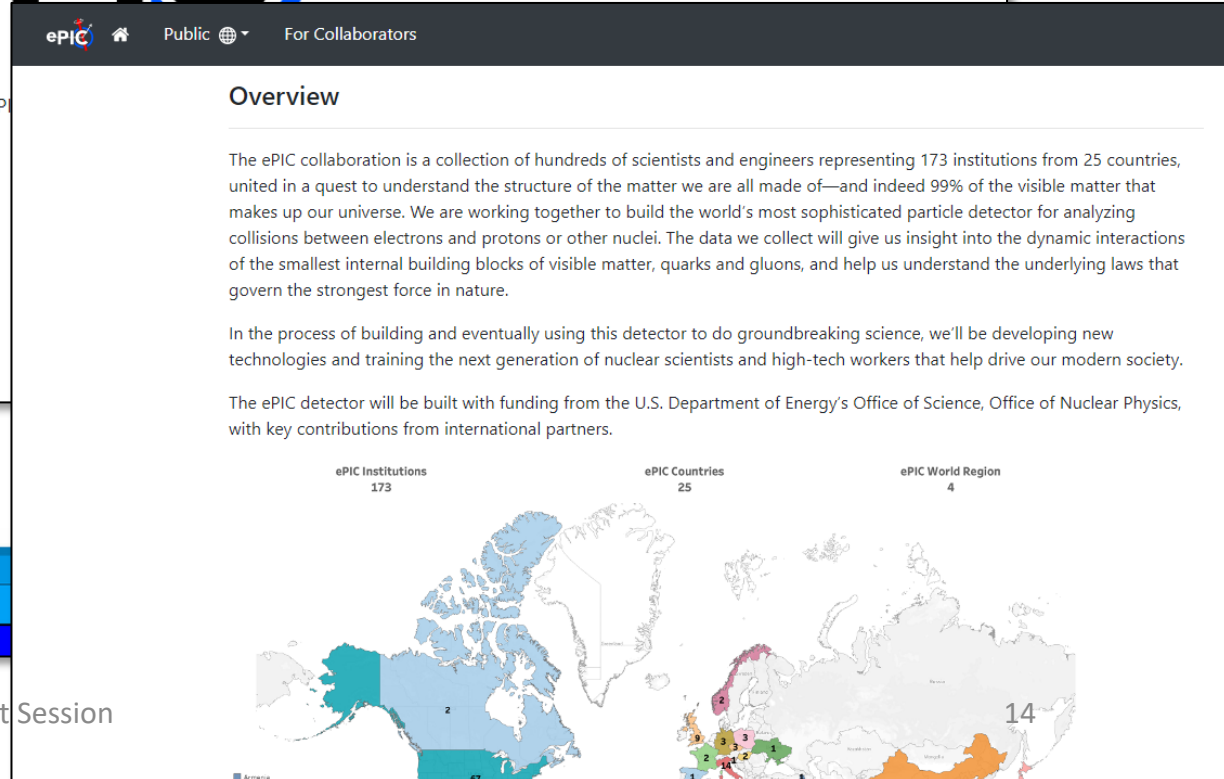
<https://www.epic-eic.org/>



The screenshot shows the ePIC website's main page. At the top left is the ePIC logo. Below it is a navigation menu with categories like 'Main page', 'Collaboration Info', 'Policies', and 'Conferences'. The main content area features a 'Main Page' heading and a large blue link that says 'Welcome to the electron-Proton and Ion Wiki'. Below this link is a red-bordered box containing the text: 'PLEASE NOTE: Some of the material in the ePIC Wiki is transit eventually be removed from the Wiki. Be sure to check the ePIC the latest information.' At the bottom of the page, there is a 3D rendering of a particle detector component labeled 'hadronic calorimeters'.



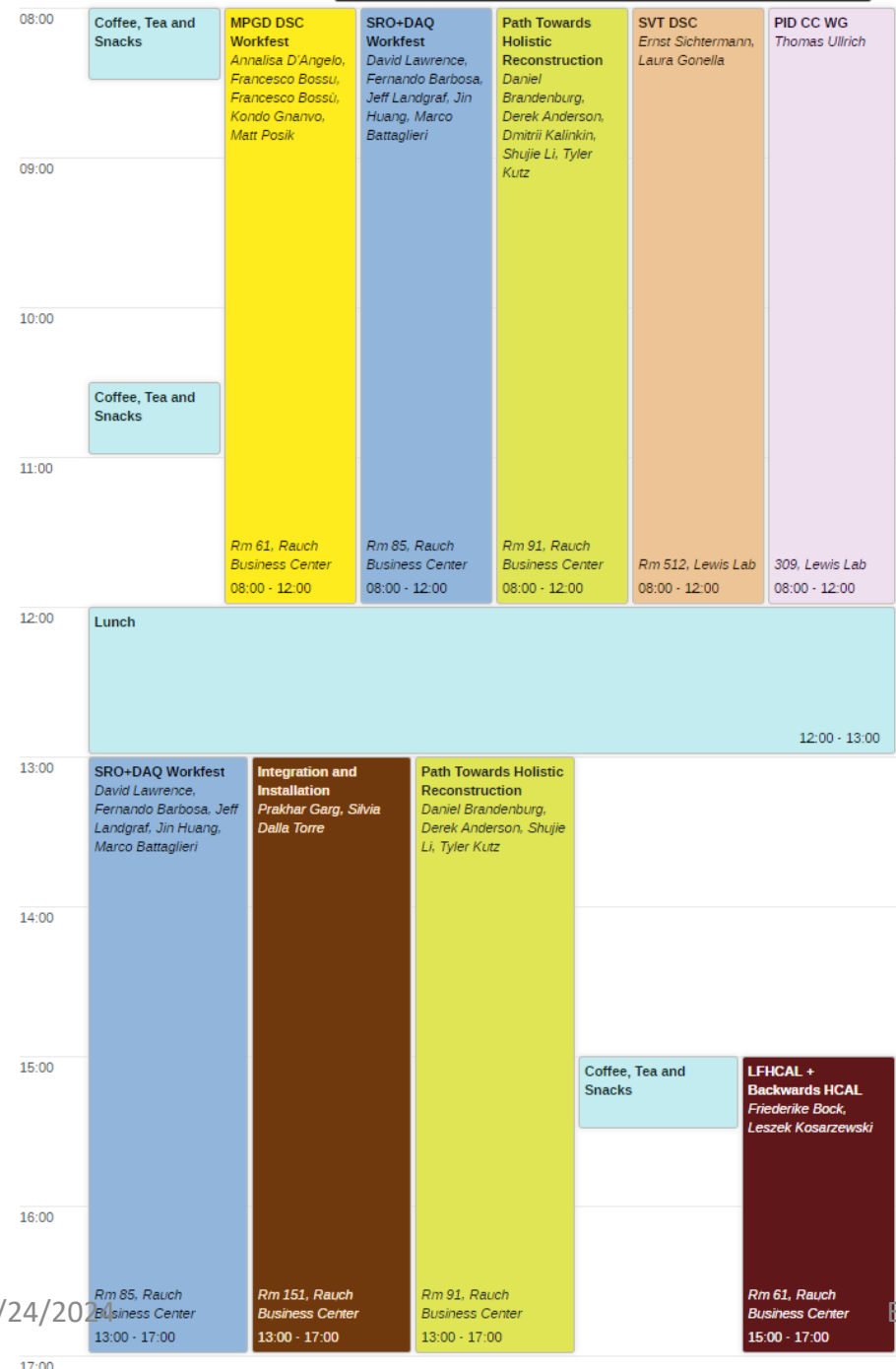
This screenshot shows a banner for the ePIC website. It features the ePIC logo on the left and the text 'WORK IN PROGRESS! This is the home of the future public website of the ePIC Collaboration.' on the right. Below the main text, it says 'Pardon the dust.' The banner has a dark header with the ePIC logo and navigation options like 'Public' and 'For Collaborators'.



This screenshot shows the 'Overview' page of the ePIC website. It features the ePIC logo and navigation options at the top. The main content area is titled 'Overview' and contains several paragraphs of text describing the collaboration. Below the text, there are three statistics: 'ePIC Institutions 173', 'ePIC Countries 25', and 'ePIC World Region 4'. At the bottom, there is a world map with colored regions and numbers indicating the distribution of institutions and countries.

Category	Count
ePIC Institutions	173
ePIC Countries	25
ePIC World Region	4

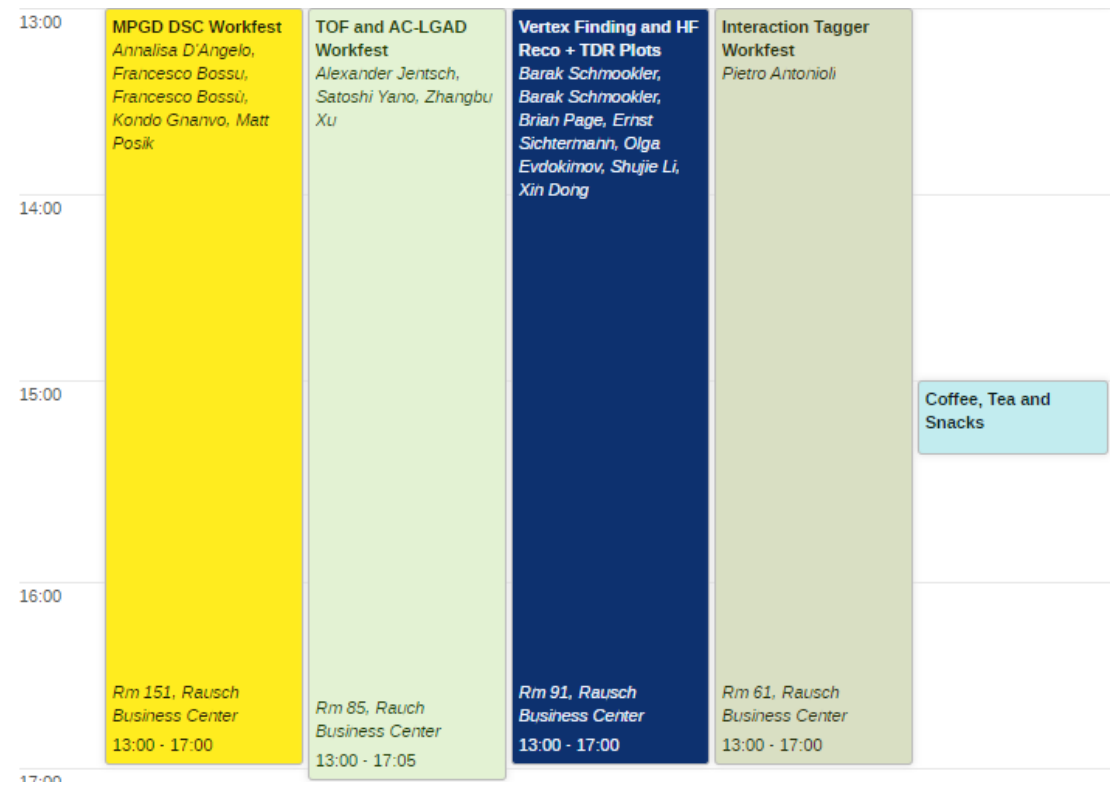
Thursday, July 25<sup>th</sup>



# This Collaboration Meeting... Workfests!

Parallel session with summaries and strategy Sat. July 27<sup>th</sup>

Friday, July 26<sup>th</sup>



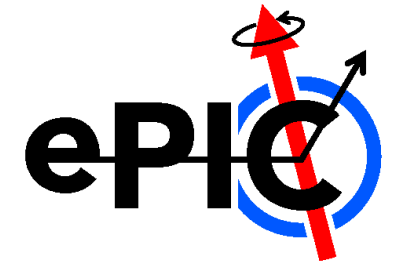


# Saturday Plenary Session

08:00	<b>Draft pre-TDR Progress Report and Technical Publication Strategy</b>	<i>Silvia Dalla Torre</i>	08:00 - 08:30
	<b>Software and Computing Coordinator Report and Publication Strategy</b>	<i>Markus Diefenthaler</i>	08:30 - 09:00
09:00	<b>Analysis Coordinators Report and Physics Publication Strategy</b>		09:00 - 09:30
	<b>Discussion - ePIC preTDR and Publication Strategy</b>		09:30 - 10:00
10:00	<b>Coffee Break</b>		10:00 - 10:20
	<b>SRO+DAQ Workfest Report + CC WG Report</b>	<i>David Lawrence et al.</i>	10:20 - 11:00
11:00	<b>Self-Proposed Contributions</b>		11:00 - 12:00

13:00	<b>Integration and Installation Workfest Report</b>	<i>Prakhar Garg</i>	13:00 - 13:20
	<b>MPGD DSC Workfest Report</b>	<i>Annalisa D'Angelo et al.</i>	13:20 - 13:40
	<b>TOF &amp; AC-LGAD Workfest Report</b>	<i>Alexander Jentsch et al.</i>	13:40 - 14:00
14:00	<b>SVT DSC Workfest Report</b>	<i>Ernst Sichtermann et al.</i>	14:00 - 14:20
	<b>LFHCAL + Backwards HCAL Workfest Report</b>	<i>Friederike Bock et al.</i>	14:20 - 14:40
	<b>Coffee Break</b>		14:40 - 15:10
15:00	<b>ePIC Early Career Activities</b>	<i>Aranya Giri et al.</i>	15:10 - 15:30
	<b>PID CC WG Workfest Report</b>	<i>Thomas Ullrich</i>	15:30 - 15:50
	<b>Electron ID &amp; Reconstruction + Path Towards Holistic Reco. Workfest Report</b>	<i>Daniel Brandenburg et al.</i>	15:50 - 16:10
16:00	<b>Interaction Tagger Workfest Report</b>	<i>Pietro Antonioli</i>	16:10 - 16:30
	<b>Vertex Finding and HF Reco. + TDR Plots for Vertex and Reco. Workfest Report</b>	<i>Barak Schmookler et al.</i>	16:30 - 16:50
17:00	<b>Closing Remarks</b>	<i>John Lajoie</i>	16:50 - 17:10

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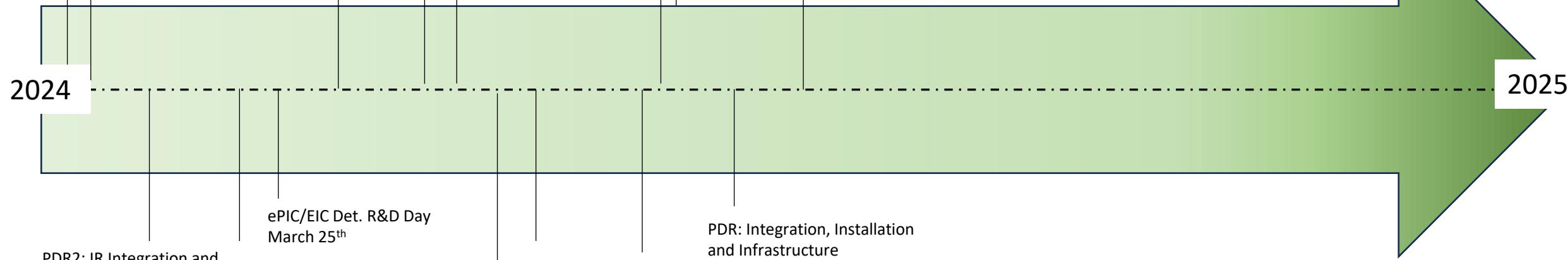
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Collab. Mtg.  
July 2024

Frascati  
Collab. Mtg.  
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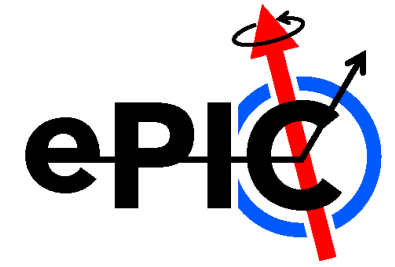
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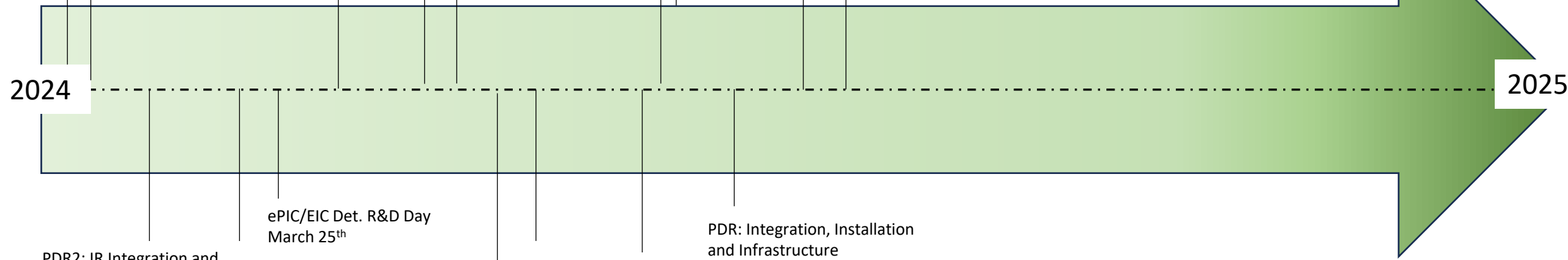
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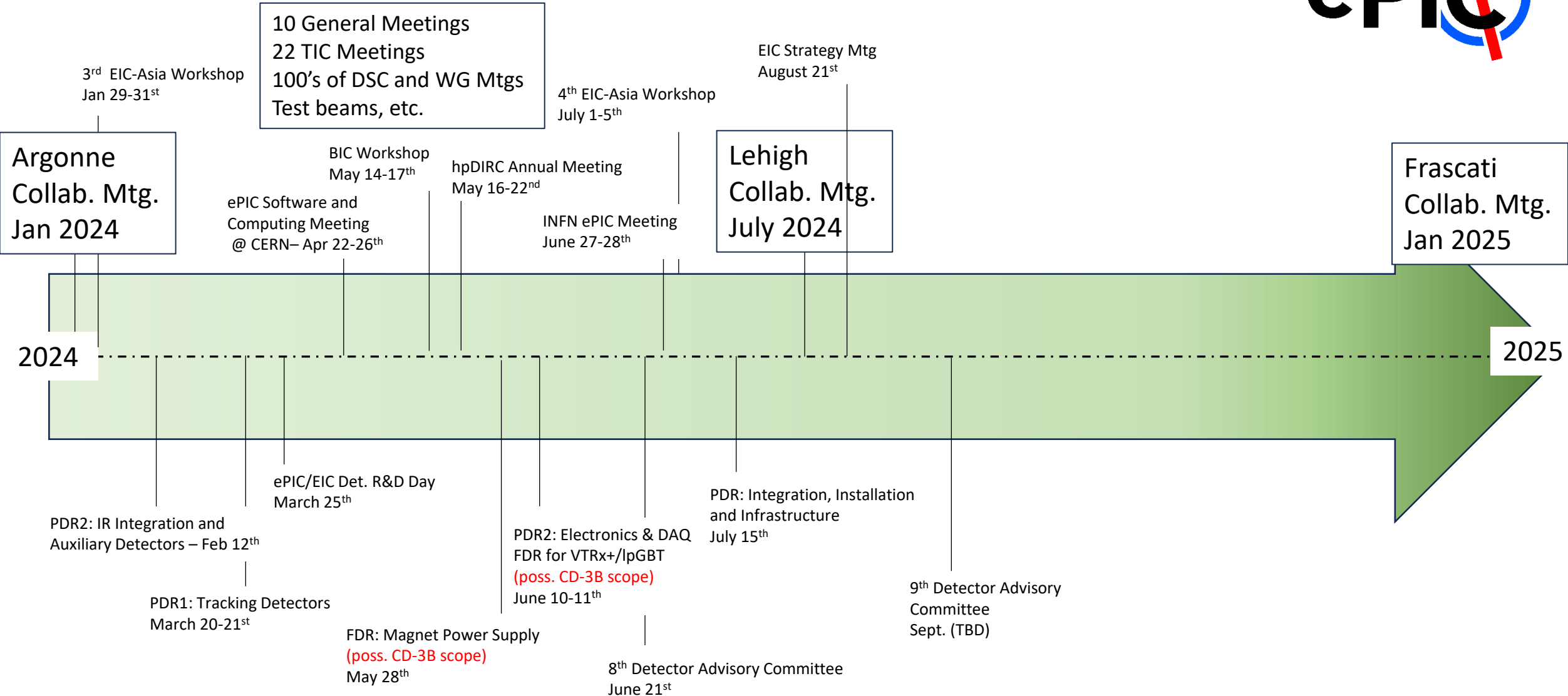
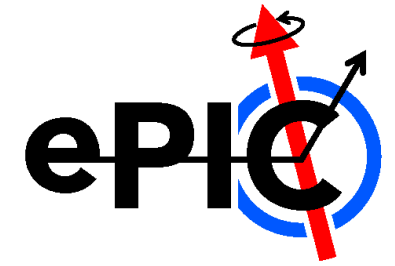
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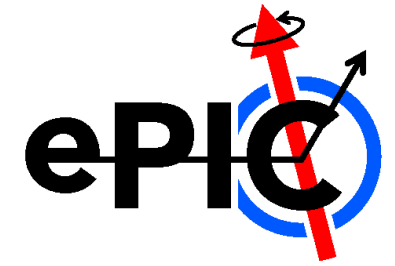
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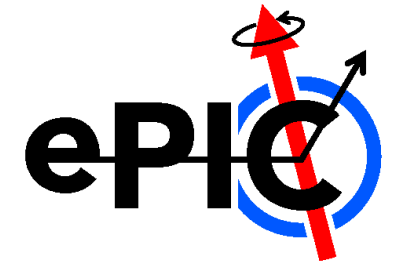
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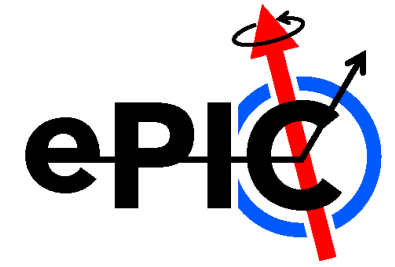
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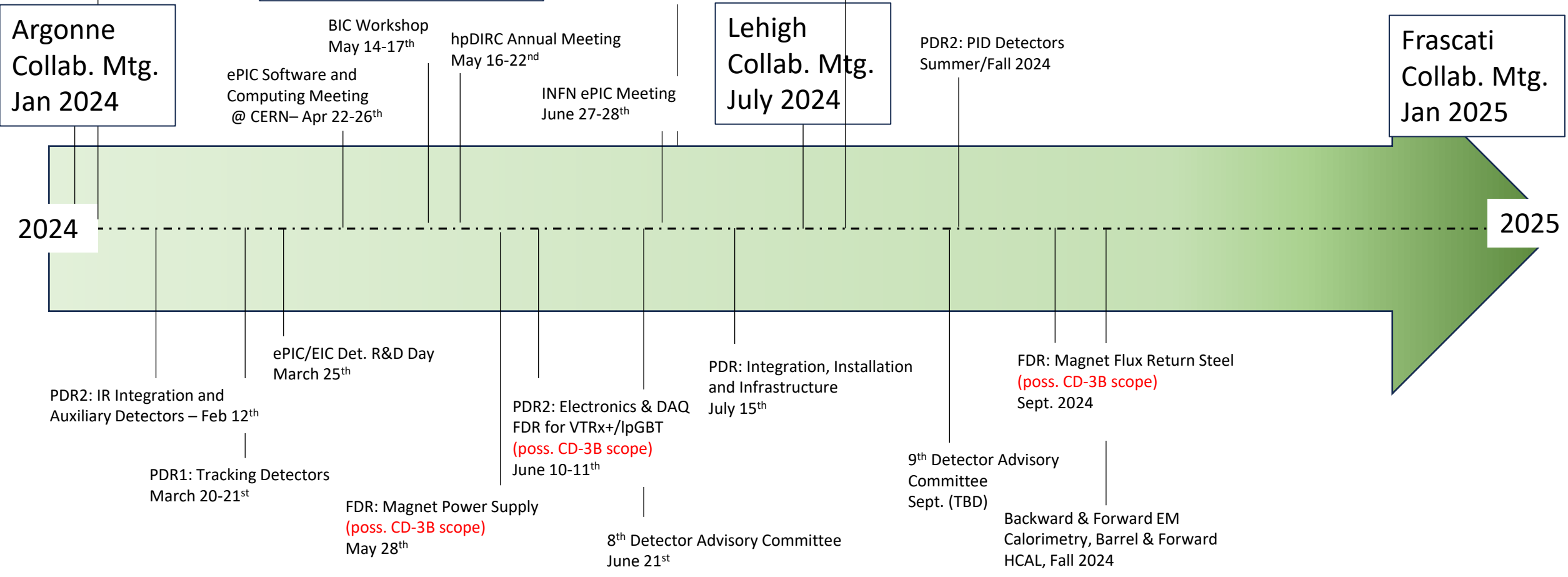
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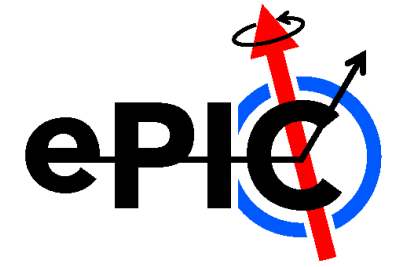
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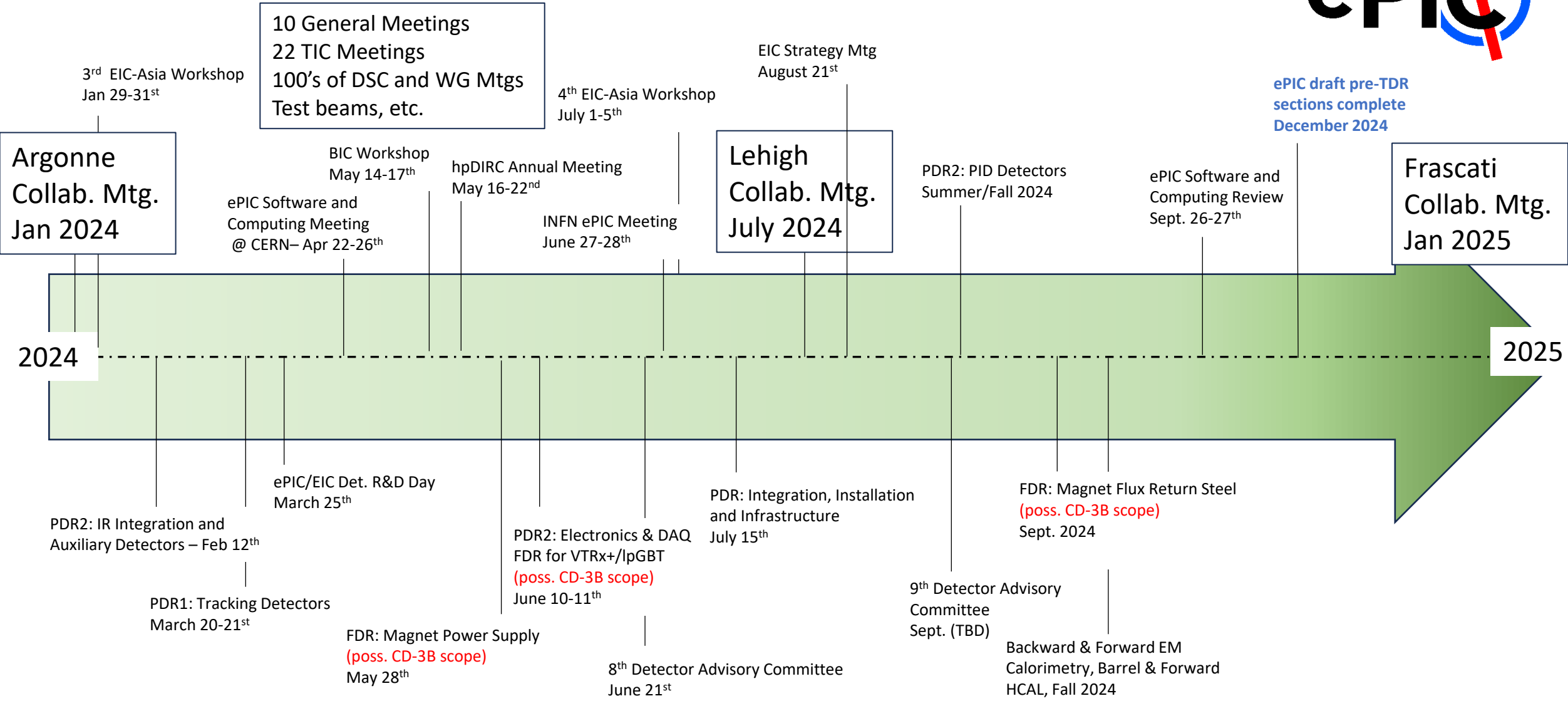
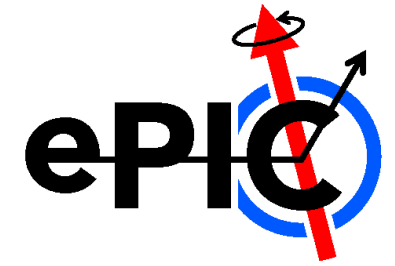
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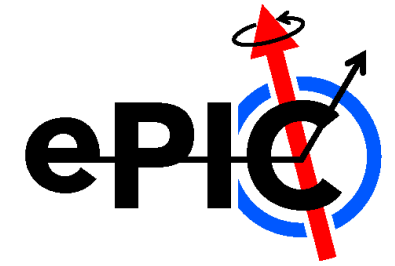
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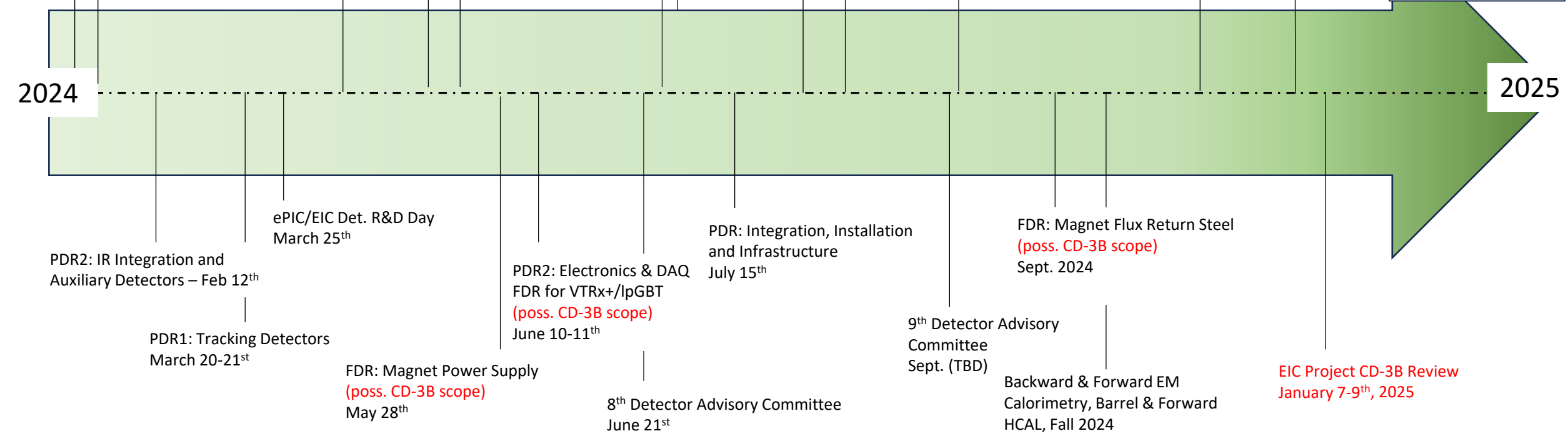


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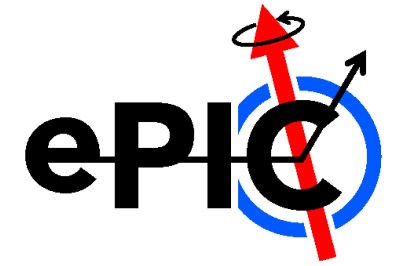
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... and a whole lot more  
MEETINGS!

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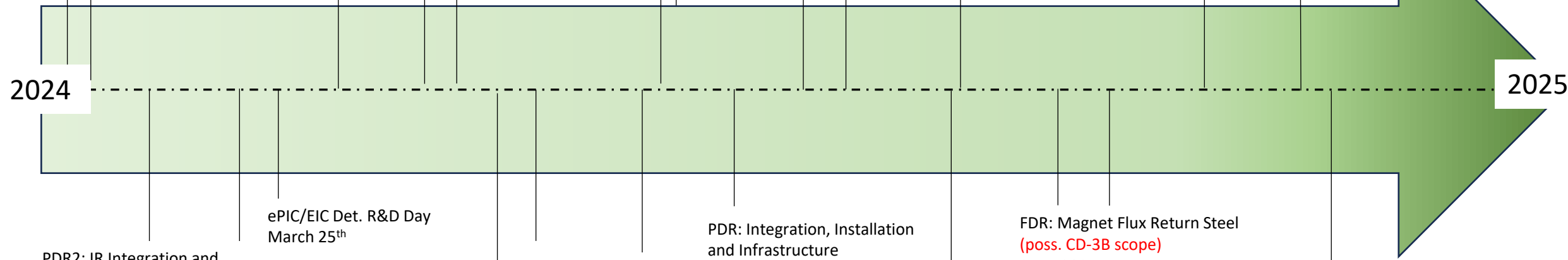
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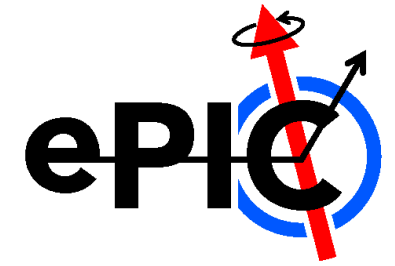
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# Challenges

- The ePIC Collaboration needs to continue to engage more of its membership in ePIC activities.
- The ePIC Collaboration needs to engage more of the NP community both in the US and internationally.
- The availability of EIC research support for university and lab groups is a major concern
  - Will continue to work with the EICUG to communicate this to funding agencies



# Jan 2025 Collaboration Meeting

- University of Rome Tor Vergata & INFN
  - January 20-24<sup>th</sup>, 2025
  - Via Frascati (Roman Hills)

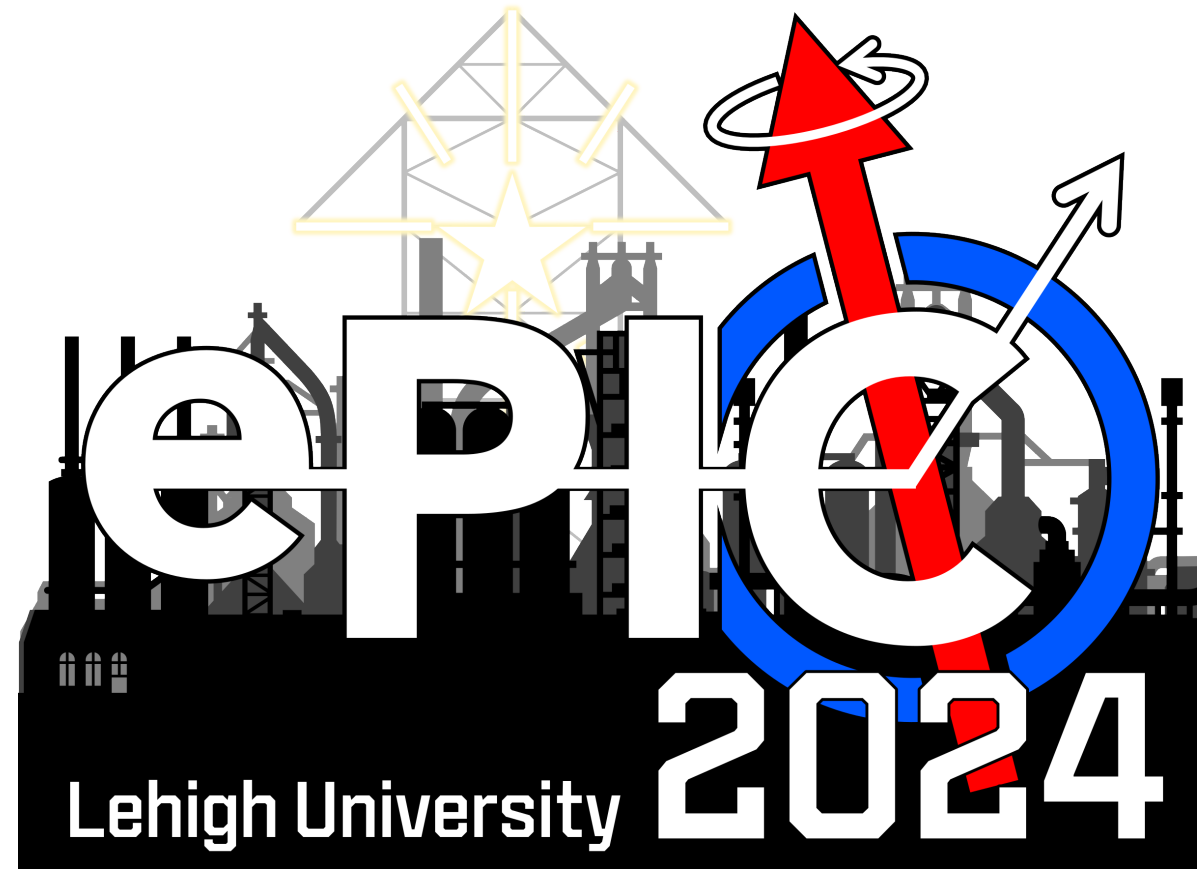
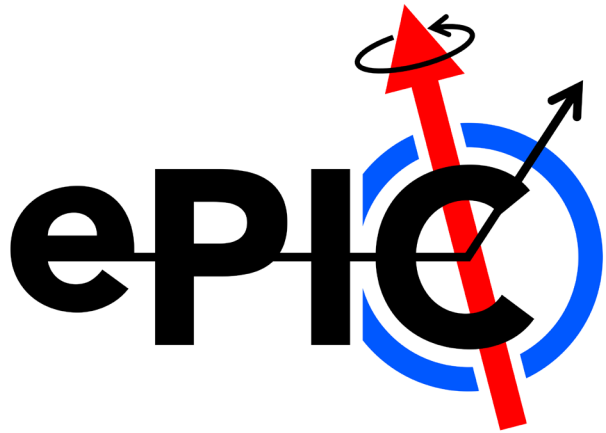


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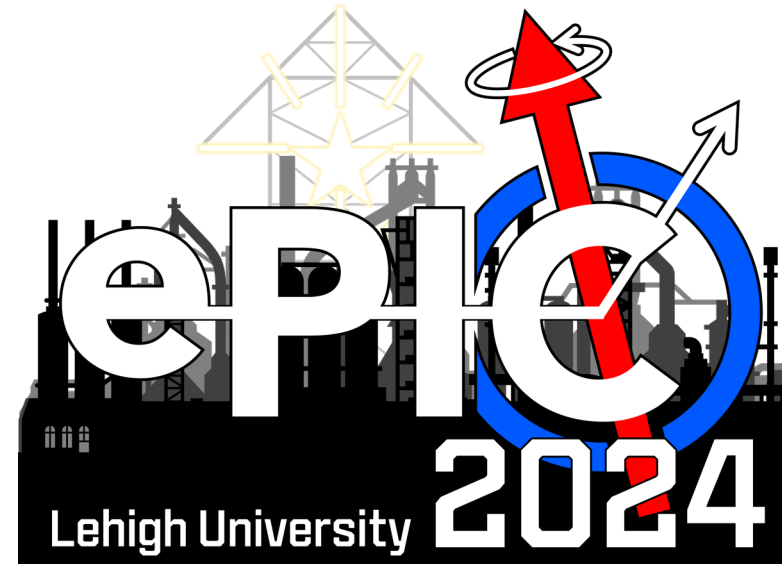
# Stickers!



Once again, many thanks to Oskar Hartbrich!

# Summary

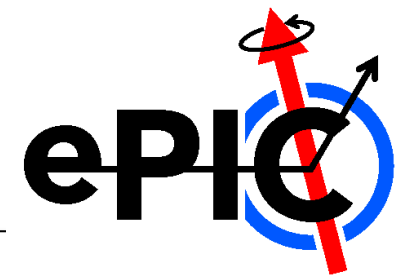
- The ePIC Collaboration is strong and growing!
  - Mechanisms of collaboration are in place and being exercised
  - Establishing policies and procedures
  - Building the tools to support the collaboration
  - Working with the EIC Project to realize ePIC
- ePIC is up to the challenges ahead:
  - Completing the technical design and TDR
  - Publishing first papers:
    - ePIC Design
    - Physics Performance
    - Software and Computing Model







# CERN Recognized Experiment



- ePIC Application for CERN Recognized Experiment:
  - ePIC leadership has submitted an application to become a CERN Recognized Experiment
  - Strong synergies between CERN and EIC
  - Important for access to CERN resources (test beams, ...)
  - Increase visibility in the European community
- ePIC presentation to CERN Recognized Experiments Committee (REC) Feb 8<sup>th</sup>
- Research Board confirmed the positive REC recommendation at CERN Council Meeting March 21-22<sup>nd</sup>
- Working with Helge Meinhard on next steps

ePIC Experiment-New Request

## Questionnaire to apply for the status of Recognized Experiment at CERN

### General information:

#### Name and location of the experiment

The electron-Proton/Ion Collider (ePIC) collaboration will design, construct, and operate the first experiment at the upcoming Electron-Ion Collider (EIC). The EIC is a frontier accelerator facility that is being designed and constructed at Brookhaven National Laboratory (BNL) in partnership with Jefferson Lab (JLab).

#### Experiment Home Page

[https://wiki.bnl.gov/EPIC/index.php?title=Main\\_Page](https://wiki.bnl.gov/EPIC/index.php?title=Main_Page)

#### Short description of the main purpose of the experiment

ePIC and the electron-ion collider will answer core questions about strongly interacting matter:

- How are these quarks and gluons and their spins distributed in space and momentum inside the nucleon? How do the nucleon properties emerge from quark and gluon interactions?
- How do colour-charged quarks and gluons and colourless jets, interact with a nuclear medium? How do confined hadronic states emerge from quarks and gluons? How do quark-gluon interactions create nuclear binding?
- How does a dense nuclear environment affect quarks and gluons, their correlations, and their interactions? What happens to the gluon density in nuclei: does it saturate at high energy, giving rise to gluonic matter with universal properties in all nuclei, even the proton?

**Status of the experiment and key dates** (e.g. being planned, in construction, data taking, analysing)

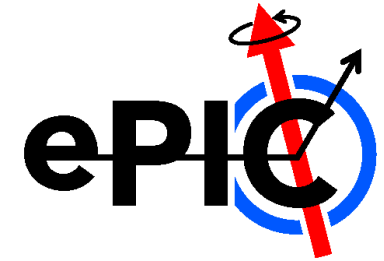
As part of the EIC project, the ePIC experiment follows the DOE Critical Decision milestones as defined in DOE 413.3B project management. At the present time, the EIC project has achieved CD-0 (Approve Alternate Selection and Cost Range) and CD-1 (Approve Alternate Cost Selection and Cost Range). CD-3A approval for long-lead procurements is expected in early 2024, while combined CD-2/3 approval (construction start) is expected in mid-2025. The experiment is expected to begin taking data in the early 2030's.

#### Information on where the experiment is reviewed (scientifically, technically, financially)

The ePIC Experiment is an integral part of the EIC Project governed by the US Office of Science and is undergoing all reviews detailed in DOE order 413.3B.

**Funding situation** (e.g. funding approved to xx %, awaiting approval by agency yy, ...)

The total EIC funding commitments through FY2024 is expected to be near \$500M - this includes \$400M from the DOE Office of Nuclear Physics and \$100M from New York state. The DOE funding corresponds to about 15% of the anticipated total project cost. At the current stage

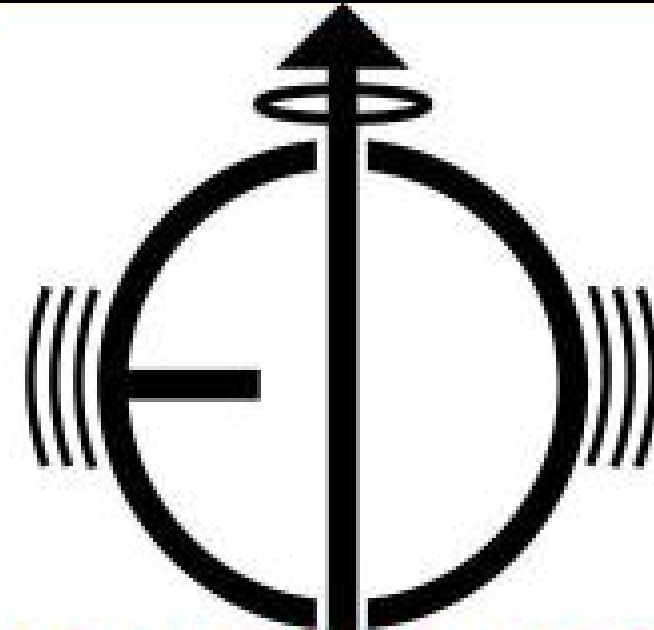
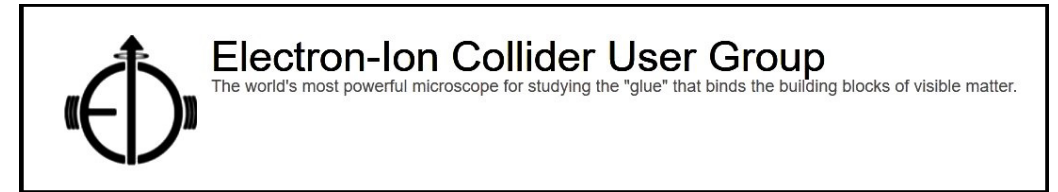


# ePIC Resources

- Public Website - <https://www.bnl.gov/eic/epic.php>
- Mailing Lists – <https://lists.bnl.gov/mailman/listinfo>
- Indico Agenda - <https://indico.bnl.gov/category/402/>
  - ePIC Software and Computing: <https://indico.bnl.gov/category/435/>
- Wiki - <https://wiki.bnl.gov/EPIC>
- ePIC Software Training:
  - Landing Page: <https://eic.github.io/documentation/landingpage.html>
  - Tutorials: <https://eic.github.io/documentation/tutorials.html>
- Mattermost: <https://chat.epic-eic.org>
- ePIC Zenodo Community: <https://zenodo.org/communities/epic>

# EICUG Membership

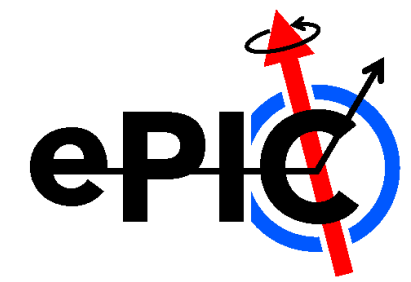
- The EICUG is a vital organization to promote the interests of the EIC community!
  - Without the EICUG we would never have gotten far enough to form ePIC!
- Please register your institution!
- Check with your EICUG IB representative to get registered as a member
- <https://www.eicug.org/content/join.html>



# Workfest/Parallel Session Organizers

- MPGD DSC:
  - K. Gnanvo, F. Bossu, A. D'Angelo, M. Posik
- TOF and AC-LGAD:
  - Zhangbu Xu, Satoshi Yano and Alex Jentsch
- SRO + DAQ
  - Jeff, Marco, David, Fernando, Jin
- Integration and Installation:
  - TC Office (Prakhar Garg)
- Electron ID & Reconstruction + Path Towards Holistic Reco.
  - Daniel Brandenburg, Tyler Kutz, Derek Anderson, Dmitry Kalinkin, Shujie Li, Umberto Tamponi
- Vertex Finding and HF Reco.+ TDR Plots for Vertex and Reco.
  - Xin Dong, Olga Evdokimov, Brian Page, S. Li, B. Schmookler, E. Sichtermann
- SVT DSC:
  - E. Sichtermann
- PID CC WG:
  - Thomas Ullrich, Umberto Tamponi
- LFHCAL + Backwards HCAL/Hackathon
  - F. Bock, L. Kosarzewski

# Analysis Coordination in ePIC



- Analysis Coordination is responsible for the simulations that demonstrate the ability of ePIC to do EIC science
  - A critical part of the TDR development process
  - Organizing physics “benchmark” plots for the TDR
  - Sets priorities for reconstruction development in conjunction with Software and Computing

