

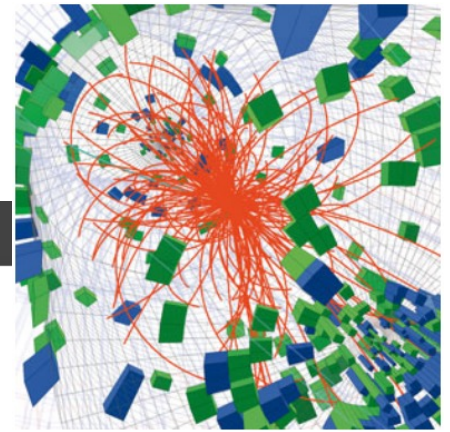


riunione CSN1

P. de Simone
LNF
29/02/2024

CSN1, riunione del 22-23 febbraio a Roma

<https://agenda.infn.it/event/39475/>



THURSDAY, 22 FEBRUARY

14:00 → 15:00 **Aggiornamento DUNE e discussione**

Speaker: Sergio Bertolucci (UNIBO/INFN)

 CSN1_Feb24_SB.pdf

Danilo Domenici

15:00 → 16:00 **Aggiornamento LHCb e discussione**

Speaker: Giovanni Punzi (Istituto Nazionale di Fisica Nucleare)


 LHCb@CSN1 Feb 2...

16:00 → 16:30

coffee break

16:30 → 17:10 **Aggiornamento BES III**

Speaker: Michela Greco (Istituto Nazionale di Fisica Nucleare)

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17:10 → 17:55 **Novita' da PADME**

Speakers: Giovanni Grilli di Cortona (Istituto Nazionale di Fisica Nucleare), Tommaso Spadaro (Istituto Nazionale di Fisica Nucleare)

 Grilli_CSN1.pdf  padme_CSN1_2024...

Paola Gianotti

FRIDAY, 23 FEBRUARY

09:15 → 09:30 **Comunicazioni**

09:30 → 10:15 **Ignite - aggiornamento e piano per il 2024**

Speaker: Adriano Lai (Istituto Nazionale di Fisica Nucleare)

 IGNITE.CSN1_2302...

10:15 → 10:45 **Progressi sull'organizzazione dei DRD e discussione**

Speaker: Nadia Pastrone (Istituto Nazionale di Fisica Nucleare)

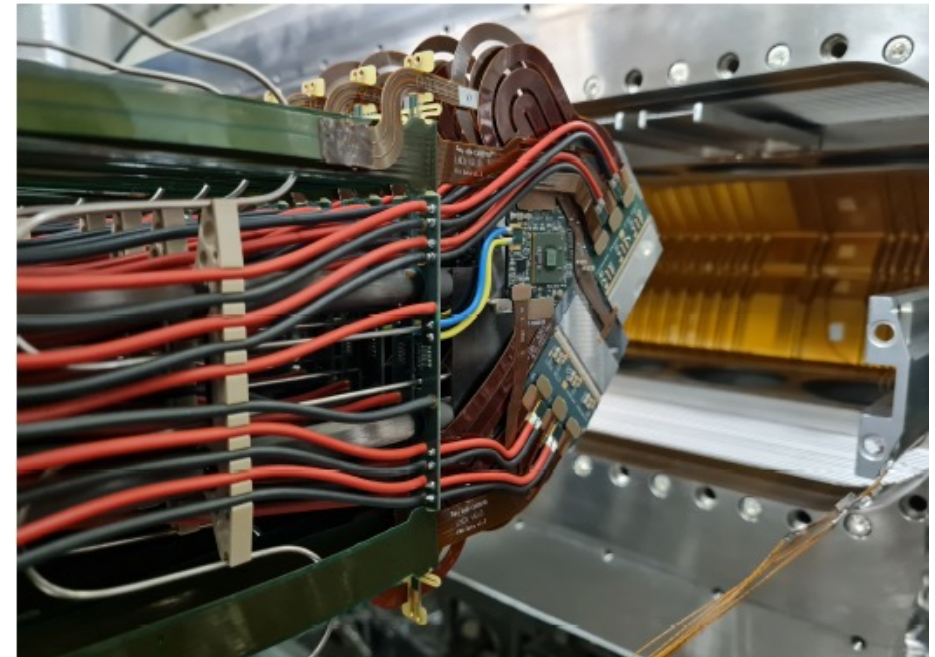
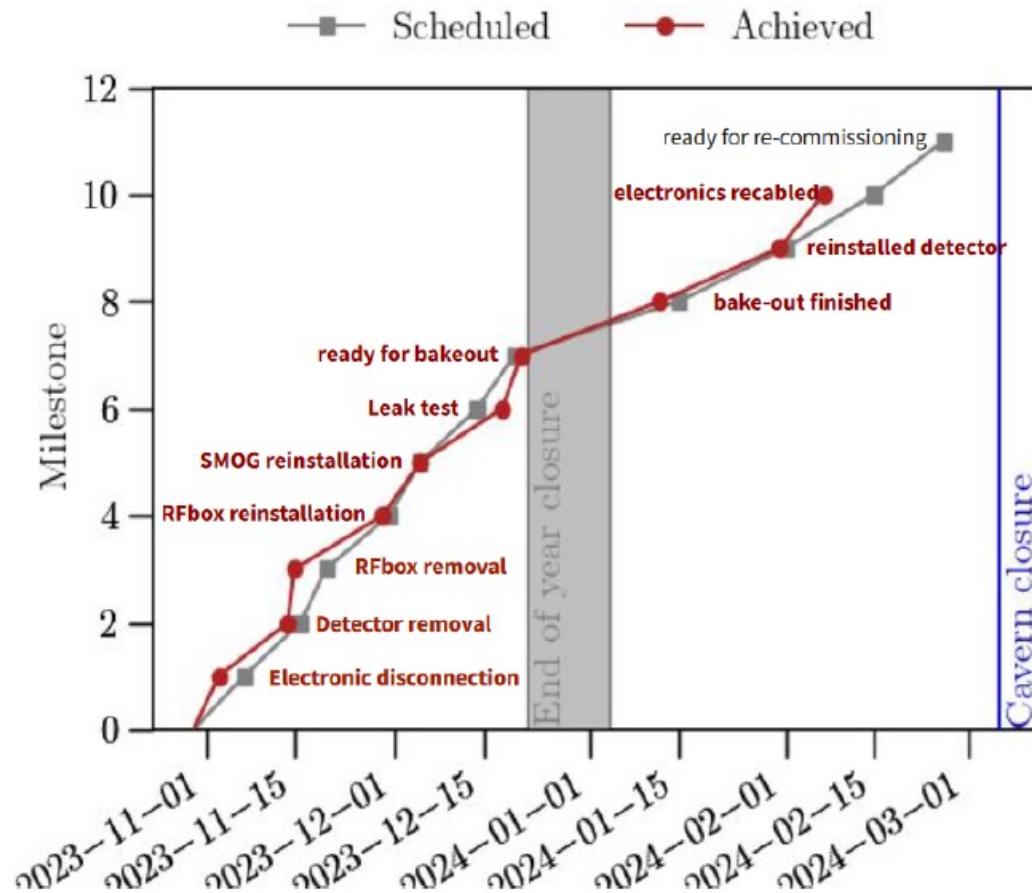
 CSN1_INF_NDRD_N...

29/02/2024

aggiornamento LHCb: VELO



- ✓ dismantling, foil replacement and re-installation → **all went according to plan**
- ✓ commissioning start → **1 week ahead before plans !!**
- ✓ RUN 2024 → **VELO back in closed position !!**



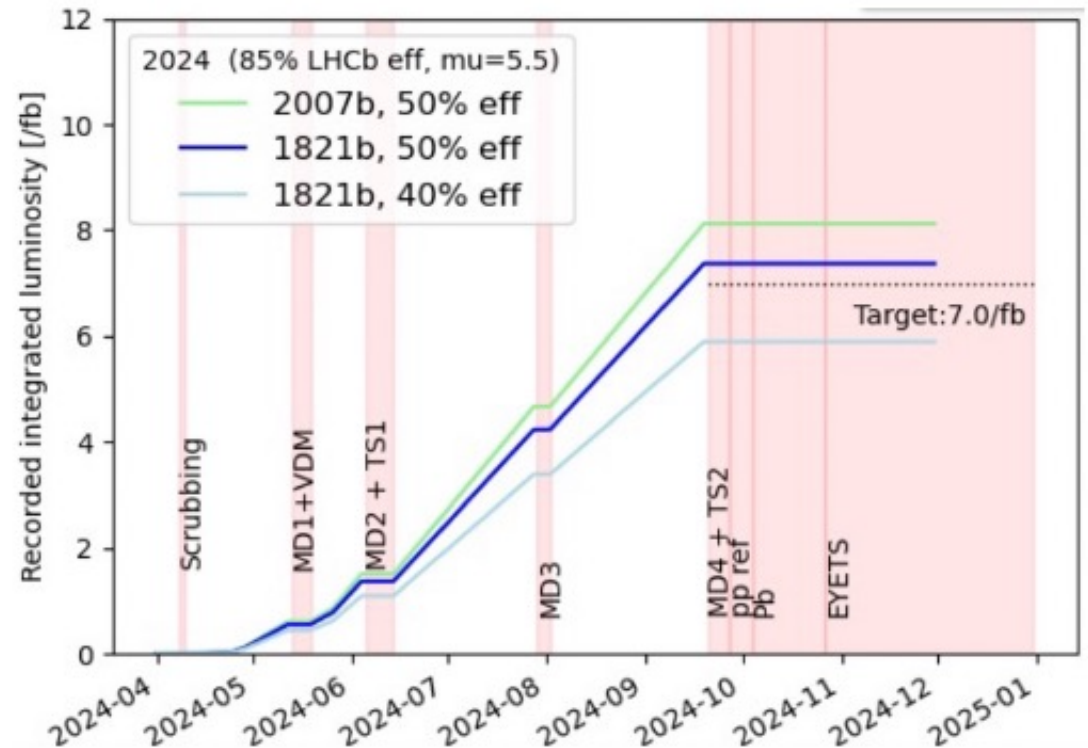
aggiornamento LHCb: RUN 2024 goals



- ⊙ integrate a high quality sample corresponding to 7 fb^{-1} of pp collisions
- ⊙ achieve stable running at nominal luminosity early in the run

main activities ongoing:

- ✓ bringing the whole data processing chain in time, including run-time alignment
- ✓ monitoring
- ✓ detector electronics commissioning task force in place → centralize solutions of common problems
- ✓ task force for detector RTA integration
- ✓ early physics measurements



aggiornamento LHCb: U2 luminosity scenarios



integrated luminosity computed for 3 values of peak lumi for 2 LHC optics:
ROUND beams and FLAT beams

	<i>Low</i>	<i>Medium</i>	<i>High</i>
<i>levelled L_{peak} ($cm^{-2}s^{-1}$)</i>	<i>1.0×10^{34}</i>	<i>1.3×10^{34}</i>	<i>1.5×10^{34}</i>
<i>total recorded</i> <i>ROUND (fb^{-1})</i> <i>FTDR</i>	<i>263</i>	<i>291</i>	<i>300</i>
<i>total recorded</i> <i>FLAT (fb^{-1})</i>	<i>290</i>	<i>336</i>	<i>359</i>

(document in preparation by machine colleagues)

GOAL: define detector scenarios, with physics performances, corresponding to High/Medium/Low values of peak luminosity, while respecting the target cost envelopes at 100%/85%/70% of FTDR baseline (about 175 MCHF)

- ✓ 6-7/03/2024 Tracking workshop: converge on global tracking aspects of the project
- ✓ 25-27/03/2024 U2 workshop: finalise discussion on detector scenarios with preliminary performance studies and costs

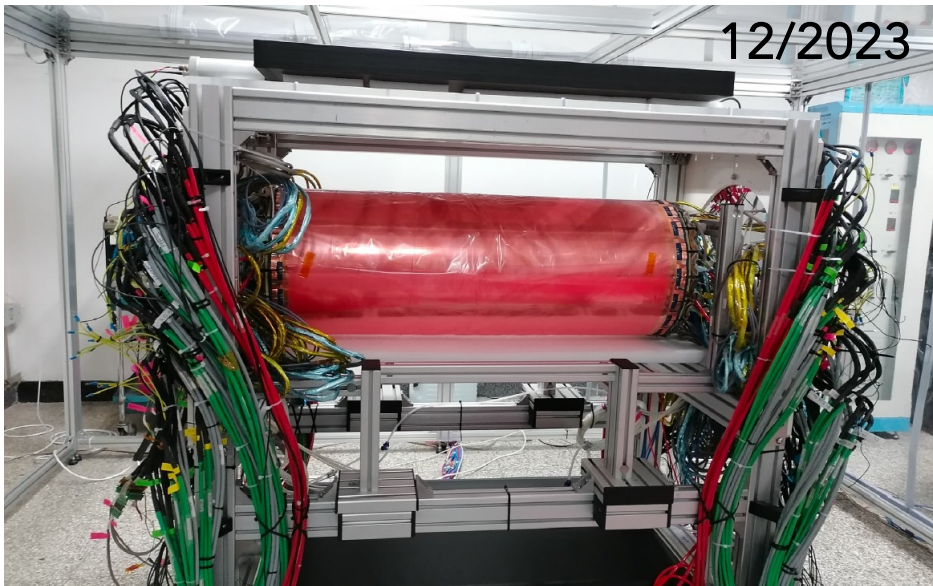
mid April 2024 → update the LHCC in a dedicated informal meeting

22/04/2024 → present the detector scenarios at the RRB meeting

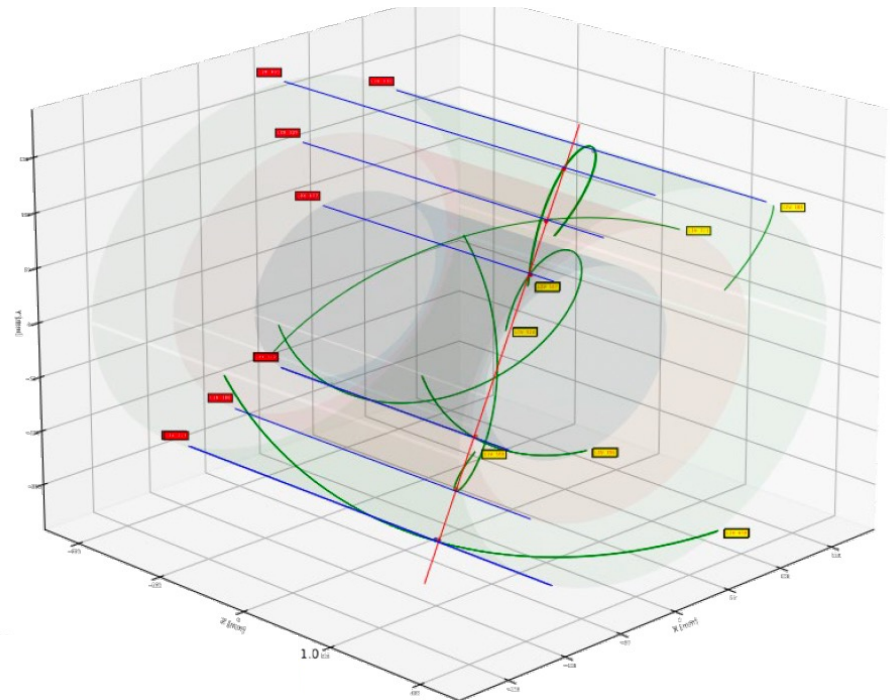
end of June 2024 → draft of Scoping Document ready for collaboration-wide circulation, all useful results, including projected performance on physics channels, need to be included

10/09/2024 → present the Scoping Document to the LHCC, **start of review**

aggiornamento BES III: CGEM - IT



- ⊙ alimentazione (tranne 1 micro di L3) ed elettronica del rivelatore e' **tutta accesa**
- ⊙ **commissioning** → cosmici da 12/2023




aggiornamento BES III: final CGEM review




- international review**
- CGEM detector has been successfully constructed and is at IHEP in Beijing
 - Time slot for installation: Summer 2024
Upgrade to BEPC-II
 - Question to be answered (and this is where we need the help of the committee):
Is CGEM-IT as a complete system ready for installation in Summer 2024, to deliver physics quality data after the shutdown?
 - Collaboration needs to decide by \approx mid-March

BES III review

 **Software Review** Within Dec 2023
Internal review
Based on data already available

 **Performance Review** Within February 2024
Internal review
Cosmic run data from L1+L2+L3 needed

 **Installation Test and Risk assessment** Within March 2024
BESIII MDC and BEPCII personnel involved

- ✓ *geometry*
- ✓ *digitization*
- ✓ *tracking*
- ✓ *analysis of benchmark channels*

Good Luck!


aggiornamento IGNITE



- realizzazione di un modulo di *read-out* integrato completo *rad-hard* ad alta densità per il *4D-tracking*, sfruttando la tecnologia CMOS 28 nm → in grado di soddisfare le richieste per rivelatori di vertice di prossima generazione ($\sigma_t < 30$ ps, $\sigma_s \approx 10$ μ m, $\Phi 10^{16} \div 10^{17}$ 1-MeV neutroni equ. per cm²)

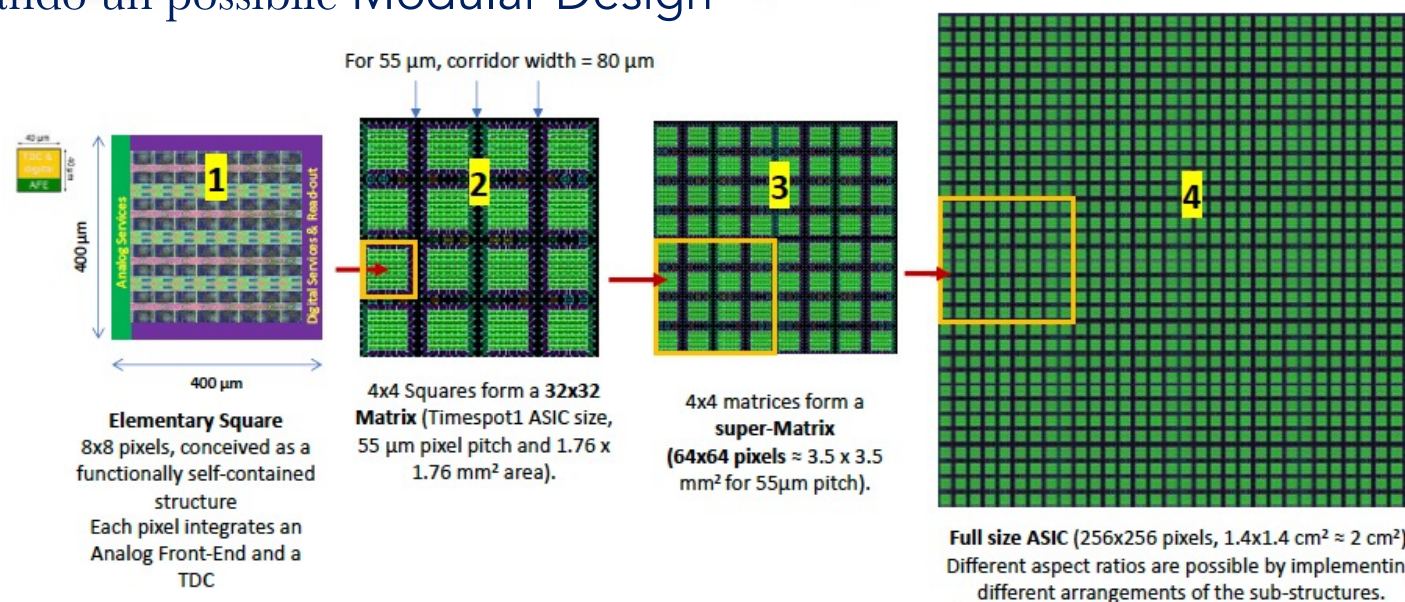
The **IGNITE** developments are of great interest for several experimental projects, where high-intensity/high resolution 4D-tracking is an enabling experimental technique:

1. LHCb-U2 vertex detector (VELO)
2. CMS Endcap tracker in “phase 3” (CMS researchers/engineers are inside **IGNITE**)
3. HIKE (NA62 upgrade, whenever approved...)
4. Neutrino tagging at extreme intensity for SBL and LBL neutrino experiments (A. Lai involved)
5. FCC-hh (nobody directly involved, but surely interesting on the technological and investment/budget sides, as the **IGNITE** technology “starts to see” the level of monster performance required in the FCC environment)

aggiornamento IGNITE

- 2023
- ✓ realizzati i primi ASICs, 8x4 pixels, anche *rad-hard*
 - ✓ i tests stanno partendo ora
 - ✓ LNF ha contribuito con il disegno dei PCB

- 2024
- ✓ un nuovo ASIC, 64x64 pixels, e' attualmente nella fase di design con il goal di arrivare all'engineering run entro la fine dell'anno
 - ✓ per la realizzazione finale di ASICs di grande area (256 x256 pixels, 1.4x1.4 cm²) si sta studiando un possibile Modular Design



e un face-to-face bonding per integrare i circuiti Analogici e Digitali → struttura 3D

→ primo dimostratore 4D-tracker previsto per la fine del 2026, durante LS3 di LHC

progressi sull'organizzazione dei DRD

Avvio collaborazioni internazionali: considerazioni

- Struttura organizzazione della collaborazione:
elezione chair Collaboration Board → elezione Spoke Person
consolidamento piani di lavoro → verifica risorse necessarie per sottoscrivere MoU
- **MoU essenziale → in preparazione da parte del CERN – light e uguale per tutti i DRD**
→ **non contiene richiesta di risorse** se non common funds per R&D blue sky
→ **firme previste nel 2024**
- **WP → Addendum:** impegno riconosciuto di Risorse (personale e materiale)
- Ogni istituto/Funding Agency ha avviato o sta avviando un processo per stabilire risorse da assegnare previo referaggio di attività prima di procedere a firmare gli Addenda
- **WP → piano pluriennale: 3-4 anni attività → richiesta a Funding Agency**

- ✓ nessun paese ha ancora fondi confermati
- ✓ Nadia Pastrone rappresentante per Italia-INFN

progressi sull'organizzazione dei DRD

DRDC: Detector R&D Committee

since June 2023

- DRD1, DRD2, DRD4, DRD6 proposals submitted by the deadline of the end of July 2023
- DRD3 submitted proposal at the beginning of October 2023
- Proposals from DRD5 and DRD7 are expected to be submitted early next year
- The formation of DRD8 is currently under discussion

DRDC Open session – March 4, 2024 – h 14

<https://indico.cern.ch/event/1356910/>

Development of Gaseous Detectors Technologies **(DRD1)**

Liquid Detectors for Rare Event Searches and Neutrino Experiments **(DRD2)**

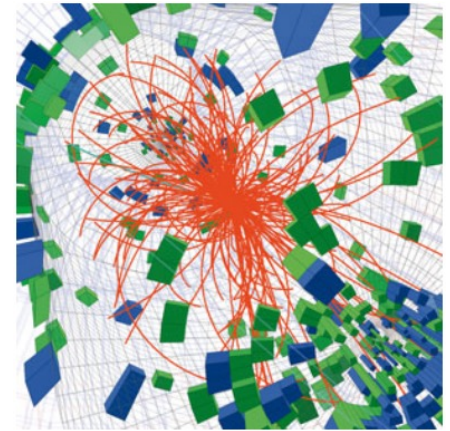
R&D on Semiconductor Detectors **(DRD3)**

R&D for Photodetectors and Particle ID **(DRD4)**

R&D on Calorimetry **(DRD6)**

CSN1, riunione del 22-23 febbraio a Roma

news dalla riunione ristretta →



- **borse di studio finanziate dalla CSN1**

- ✓ borse per studenti triennali: circa 50 domande

- borse per studenti magistrali: 72 domande

- ✓ commissioni:

- borse trimestrali per studenti magistrali/neo-laureate:** Barbara Liberti, Giuseppe Finocchiaro, Mario Pelliccioni

- borse di un mese per student triennali:** Carla Sbarra, Daniele del Re e la sottoscritta

- le commissioni sono al lavoro, Roberto intende assegnare le borse in tempo per la giunta del 15 Marzo

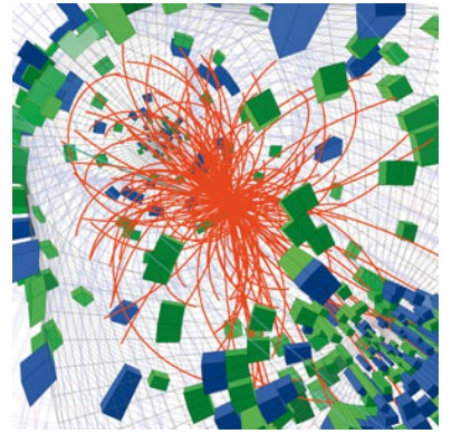
- l' INFN ha vinto ricorso al concorso dei Comma 2

- formate le Commissioni per i passaggi a secondo livello

- entro l'anno verranno banditi posti da ricercatore di terzo livello

- preoccupazione sulla questione Assegni di Ricerca → non ci sono notizie sulla loro sorte. Assegni di Ricerca validi fino a Luglio, la probabilita' che non vengano prolungati e' reale

- **L'INFN e la Strategia Europea per la Fisica delle Particelle:** 6-7 Maggio, Roma
attivit  INFN per lo studio di fattibilita' dei collider futuri, per le roadmap sugli acceleratori e sui rivelatori

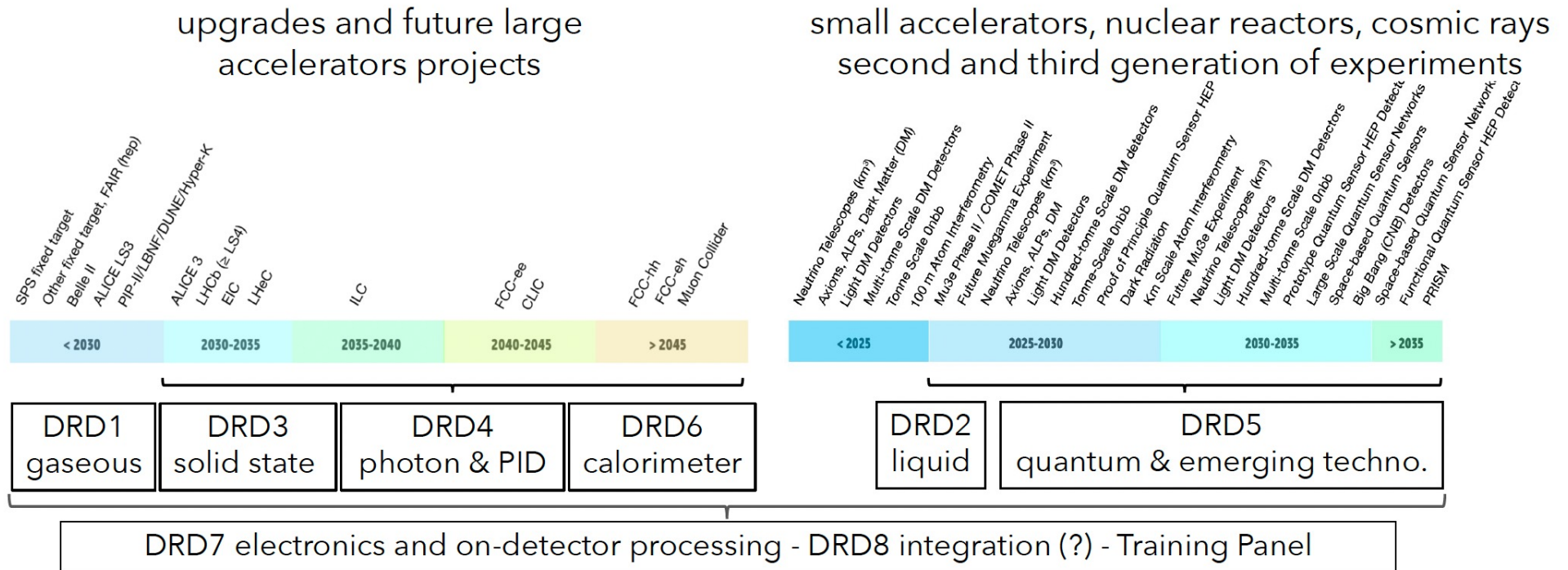


Grazie !

DRD proposal content

- Scientific programme
 - breakdown in Work Packages with Deliverables due to achieve research goals Milestones
 - considering development of technologies for other DRDs and/or shared developments of similar components with different specifications or operating conditions
 - Planning is focused on first R&D period of 3 - 4 years with prospect for longer term
 - stepping stone projects on the time scale of HL-LHC LS4
 - iterations toward new technologies - new materials - ultimate radiation tolerance for longer term
 - Human resources and funding at the level of WPs to evaluate feasibility
 - in public document
 - list of institute wishes to contribute
 - estimate of human and funding resources required
 - sums of the available/additional expected resources
 - confidential to DRDC at the level of institutes
 - human and funding resources expected to be available/prolongated
 - new resources being requested to achieve the strategic scope
- Basis to establish Funding Agency commitments to WP deliverables in MoUs

Context of HEP projects for Detector Research & Development



Strategic DRD programmes cover evolving TRLs* between 3 to 6

* [Technology Readiness Level](#) defined by NASA, low TRL < 3 also often referred as "blue sky", TRL > 6 are experiment specific engineering

** Planning of projects is for physics start at the time of the roadmap, end of strategic R&D must consider project engin., constr. and instal. time