

# *News from the ECFA Roadmap Implementation*

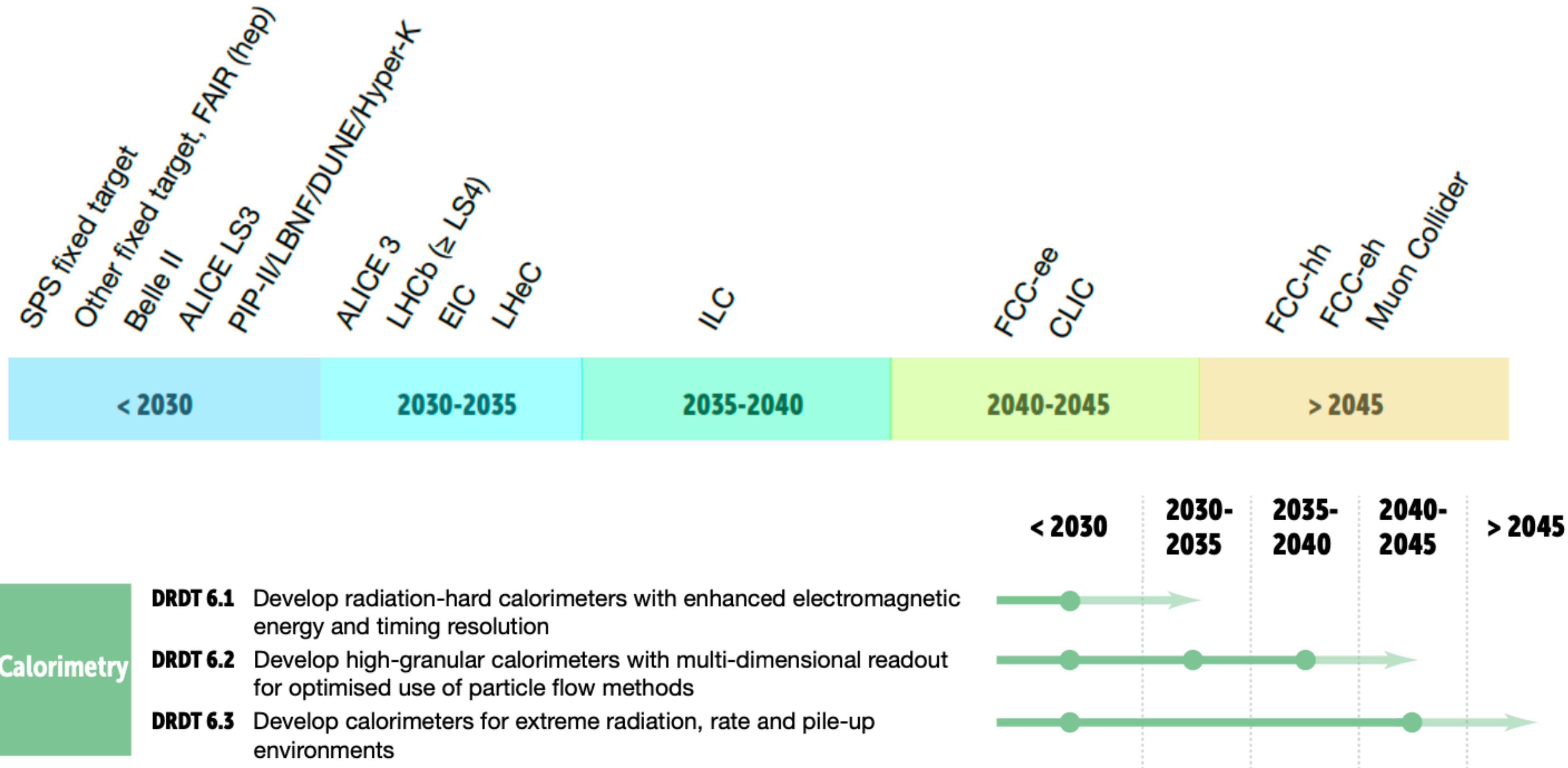
## **Calorimetry**

**Frank Simon**

Terascale Detector Workshop 2023

# Calorimetry in the Roadmap

## The Context



=> Central themes: timing, granularity, resolution and radiation hardness

# Towards DRD6

## *Structuring a New Collaboration*

- A first workshop January 12, 2023: <https://indico.cern.ch/event/1212696/>

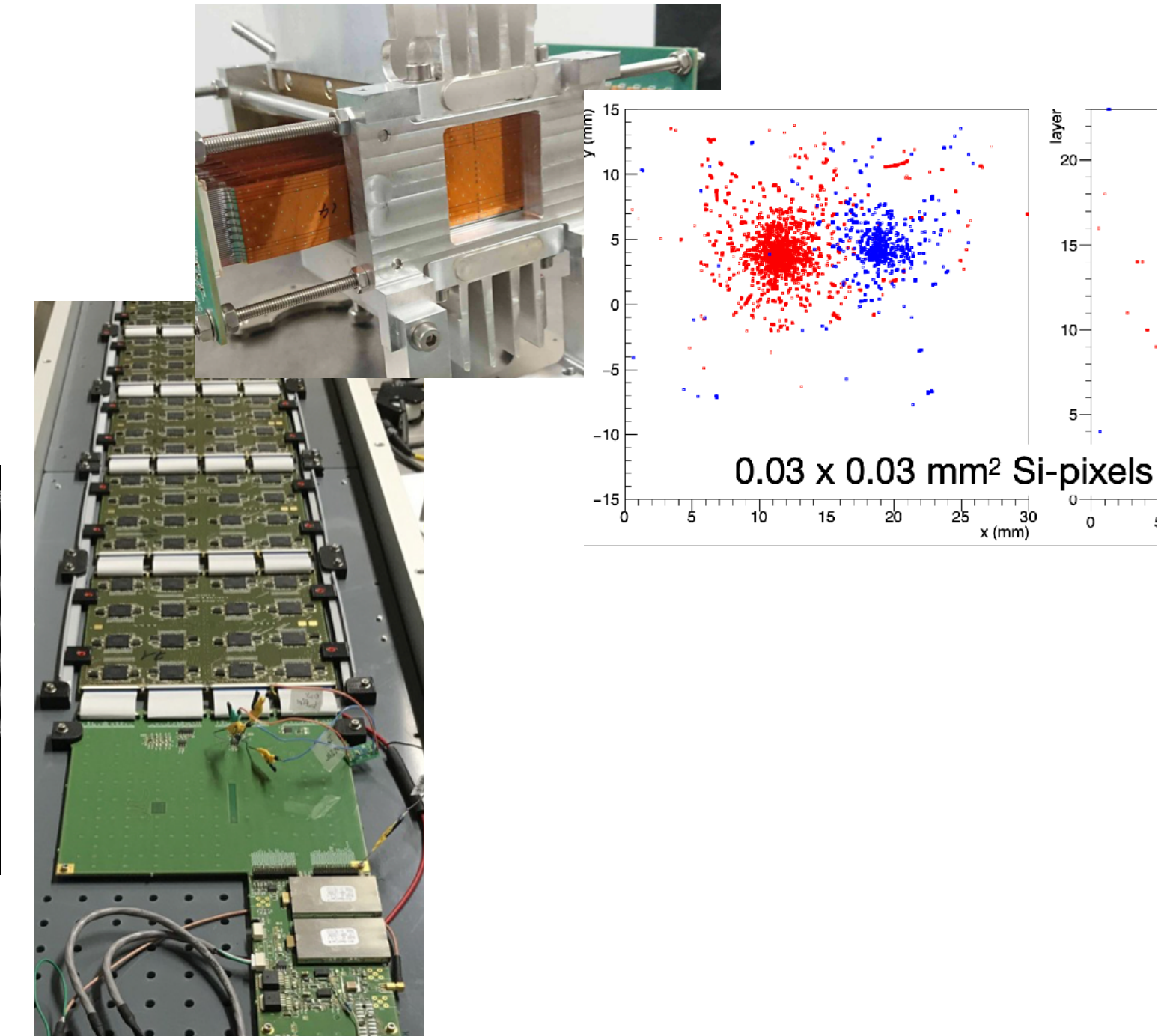
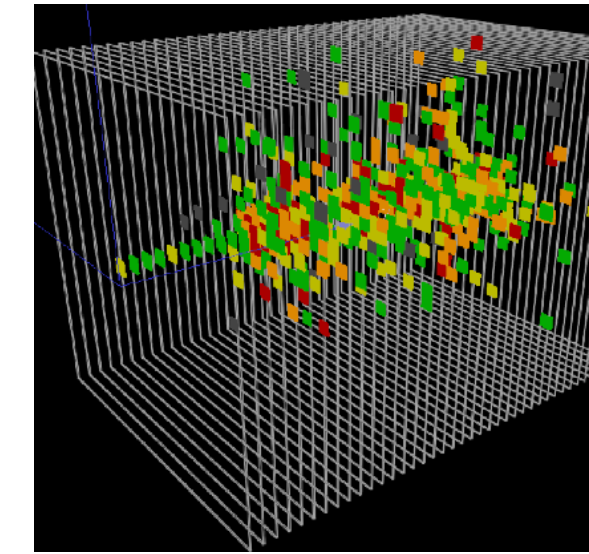
Already structured around “proto-workpackages”:

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### ***Sandwich calorimeters with fully embedded electronics***

“CALICE-style” calorimeters - extending to MAPS  
digital ECAL, highly compact forward calorimeters



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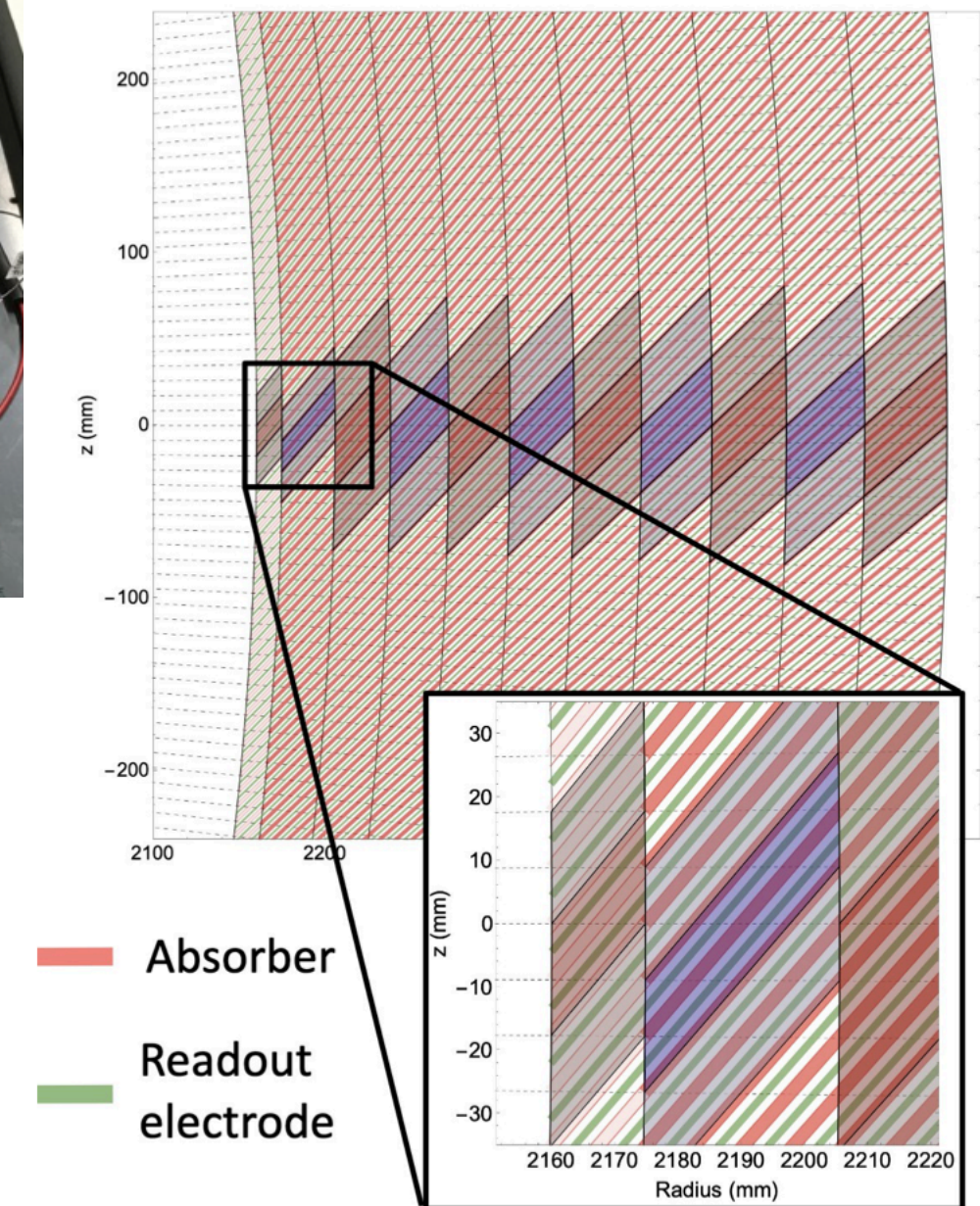
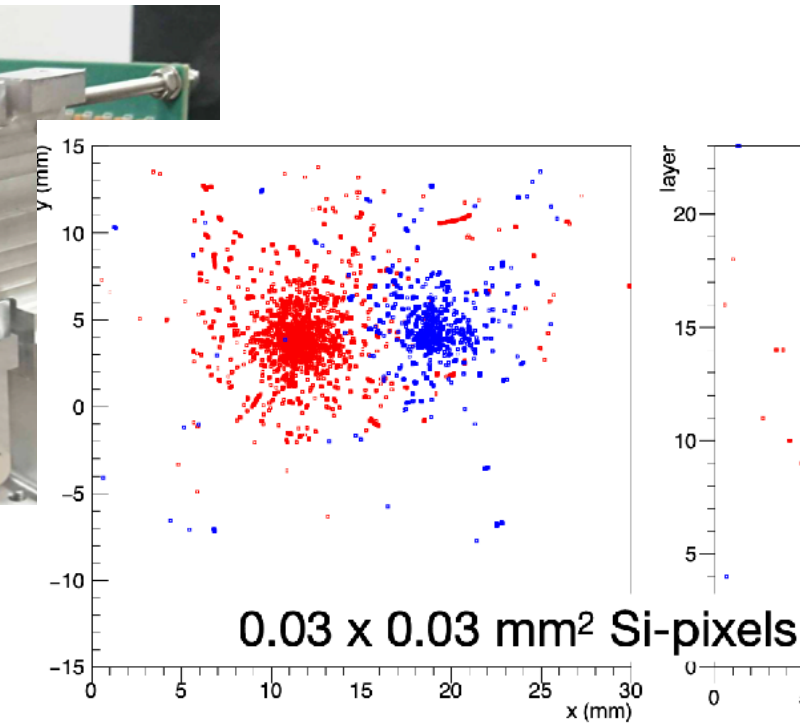
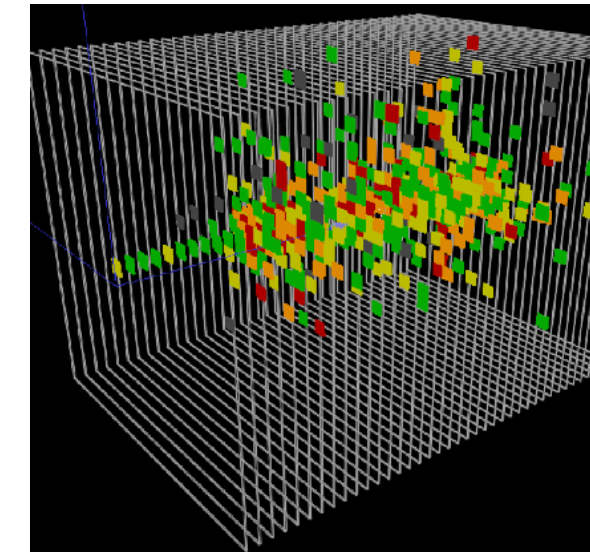
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### ***Liquefied noble gas calorimeters***

granular LAr calorimeters



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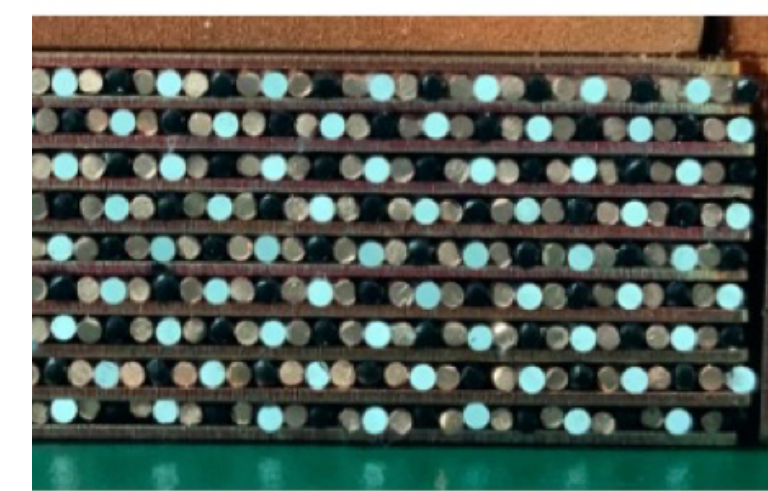
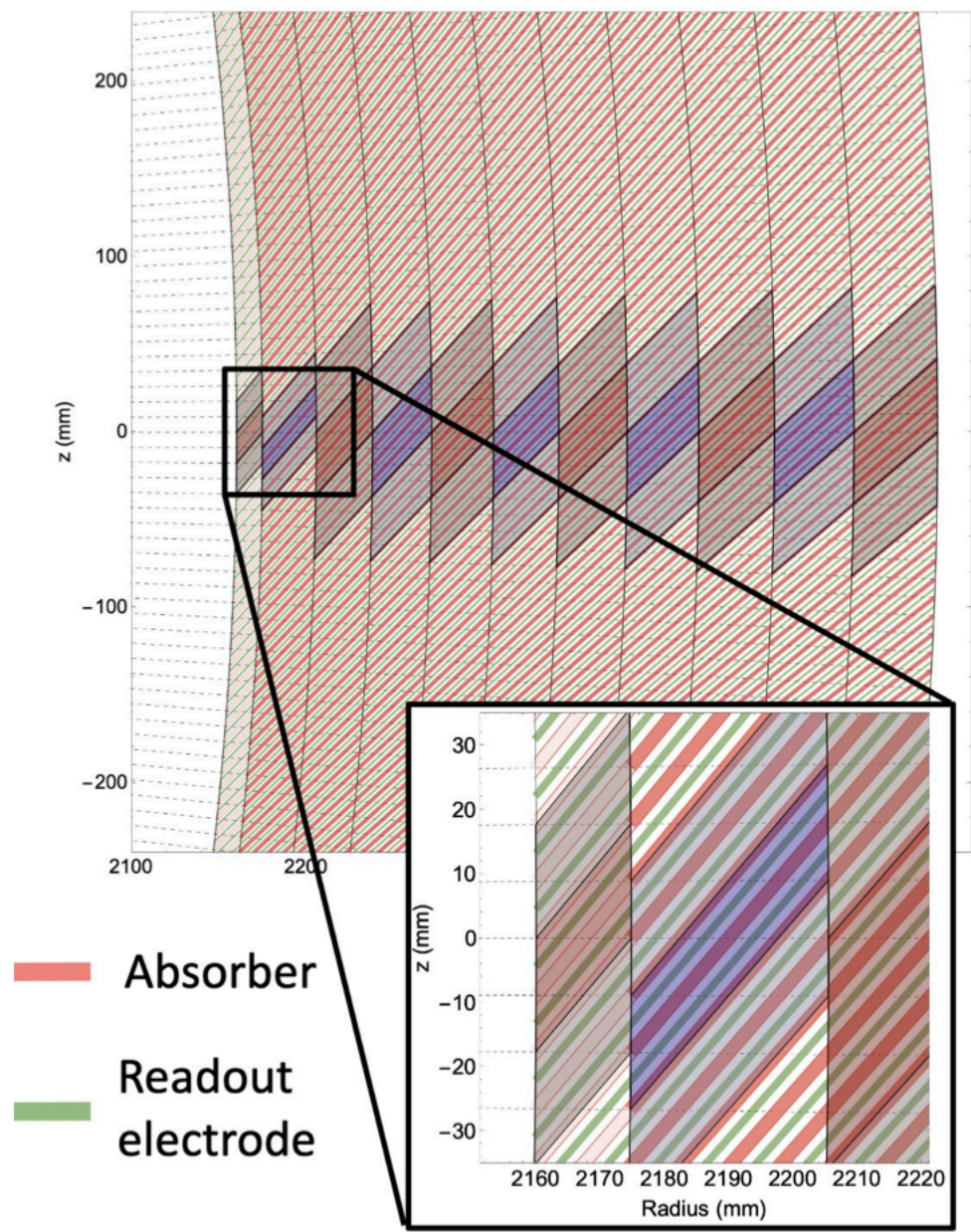
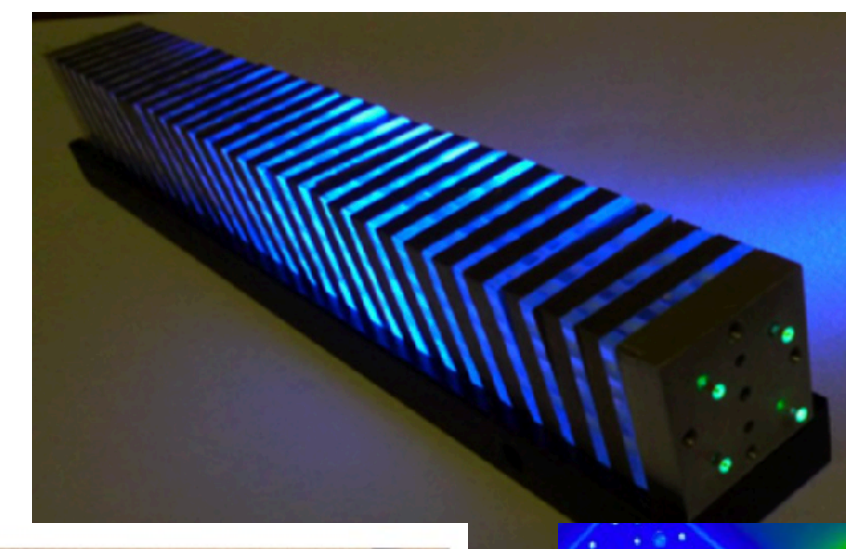
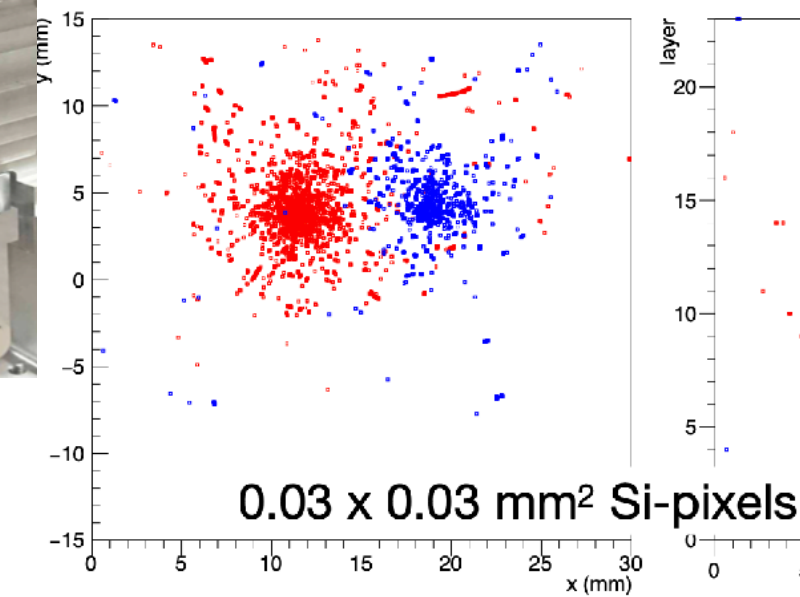
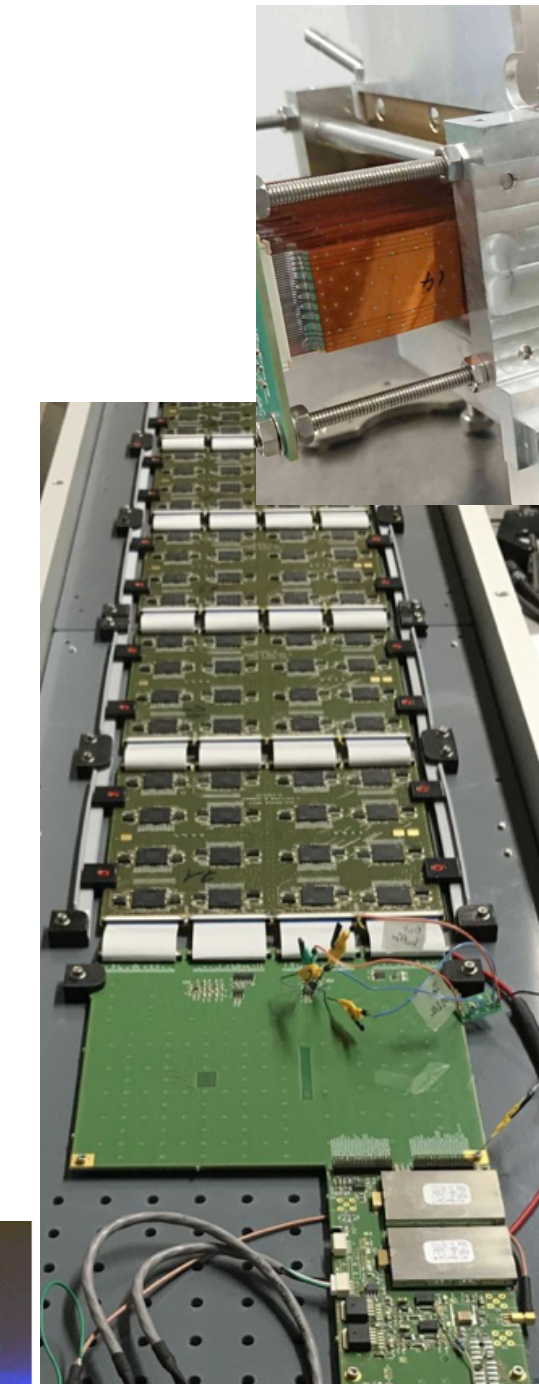
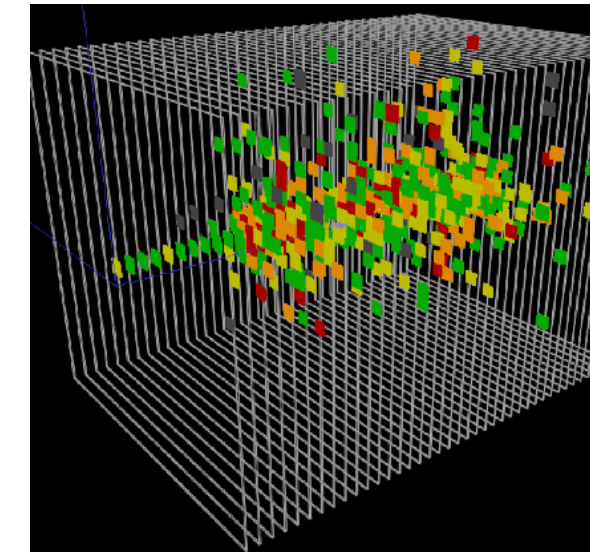
granular LAr calorimeters

### ***Optical Calorimeters: Scintillating based sampling and homogenous calorimeters***

ultrafast calorimeters -> LHCb Upgrade II

dual readout

new scintillation materials



- A core team in place to guide and structure proposal

Evolved out of Roadmap TF6: “*TF6+*” - Coordinators Roberto Ferrari (INFN Pavia), Roman Pöschl (IJClab)

Martin Aleksa, Etienne Auffray-Hillemanns, Dave Barney, Gabriella Gaudio,

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Towards the proposal: “*DRD6 proposal team*”:

Recruited from TF6+, Workshop Speakers, Global Contacts

- **Track 1:** Sandwich calorimeters with fully embedded Electronics

Adrian Irls (IFIC), Frank Simon (KIT), Jim Brau (U Oregon) Wataru Ootani (U Tokyo)

- **Track 2:** Liquified Noble Gas Calorimeters

Martin Aleksa (CERN), Nicolas Morange (IJCLab), Marc-Andre Pleier (BNL)

- **Track 3:** Optical calorimeters: Scintillating based sampling and homogenous calorimeters

Etienne Auffray (CERN), Sarah Eno (U Maryland), Gabriella Gaudio (INFN-Pavia), Macro

Lucchini (INFN Milano-Bicocca), Philipp Roloff (CERN), Hwidong Yoo (Yonsei U)

- **Track 4:** Alternatives or transversal proposals

all



- In preparation for the proposal:  
Input-proposals by “interest groups” requested by April 1:
  - Multiple institutes - could form the nucleus for a workpackage in DRD6
  - Should outline research plan - with ideas for milestones / major deliverables
  - Confidential part giving ideas of resources: available and (plausible!) *ambition* for upcoming funding requests

Based on this: Proposal team to develop DRD6 proposal.

Current goal: Submit end of Q2 / early Q3 2023 to DRDC for review

=> Start of DRD6 Q1 2024, following approval by CERN RB

Next DRD6 community workshop: April 20, 2023 at CERN: <https://indico.cern.ch/event/1246381/>

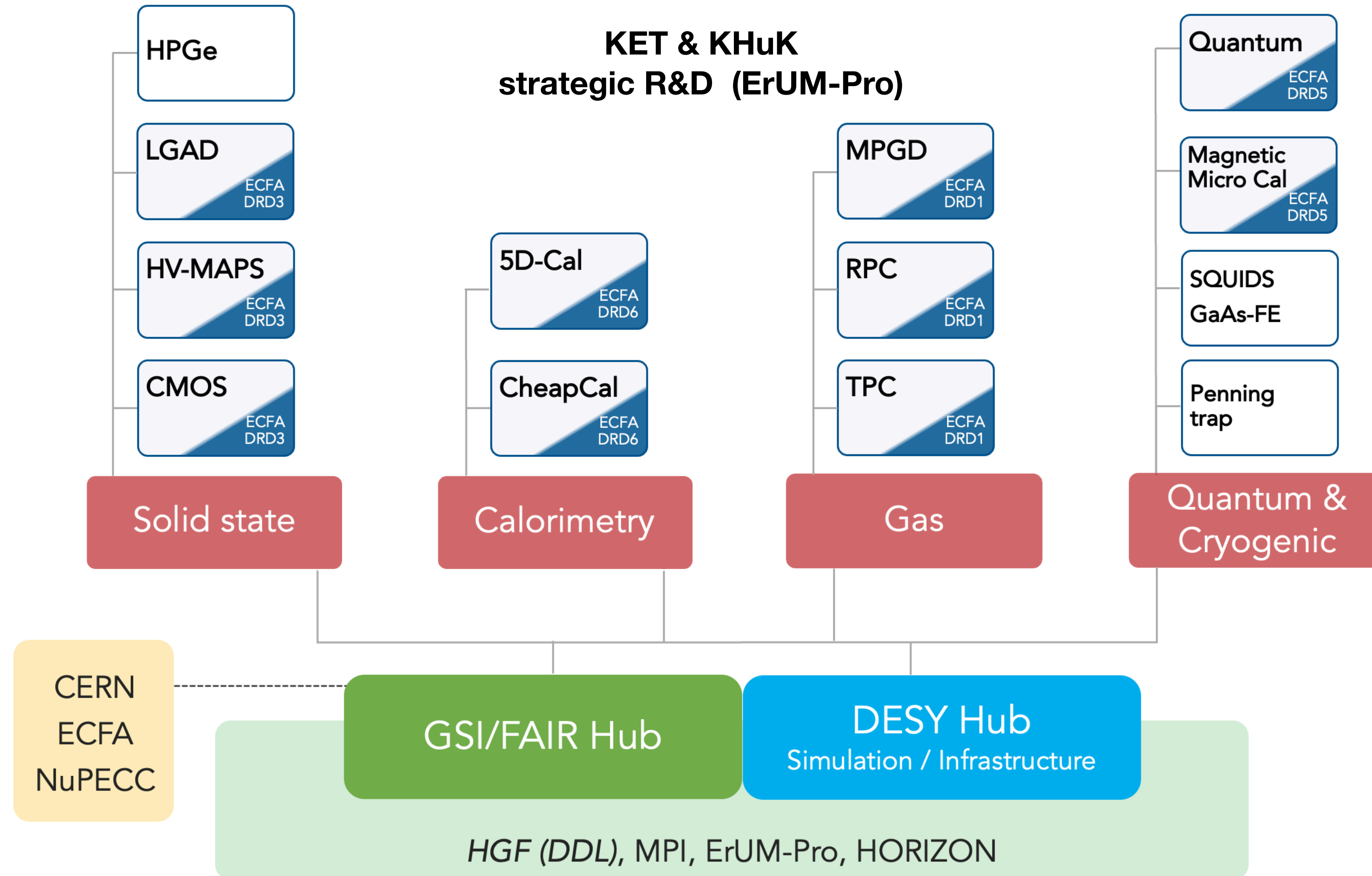
# The Situation in Germany

*Mapping the ECFA Roadmap to the ErUM-Pro Verbundforschung*

- NB:  
Proposal deadline for FB 2024-2027: **July 1, 2023**

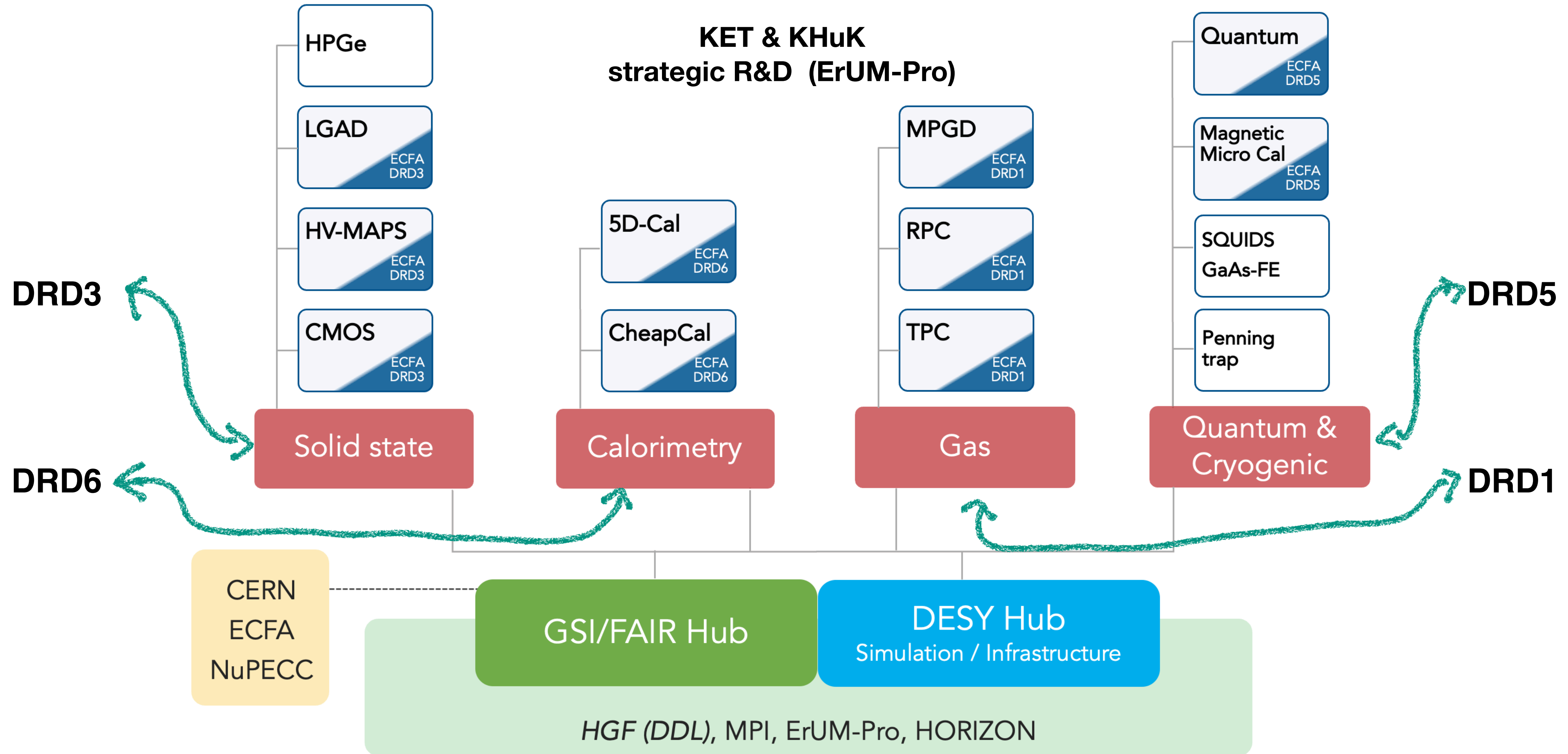
# Plans for R&D in FB 2024-27

From the "Strategiegespräch"



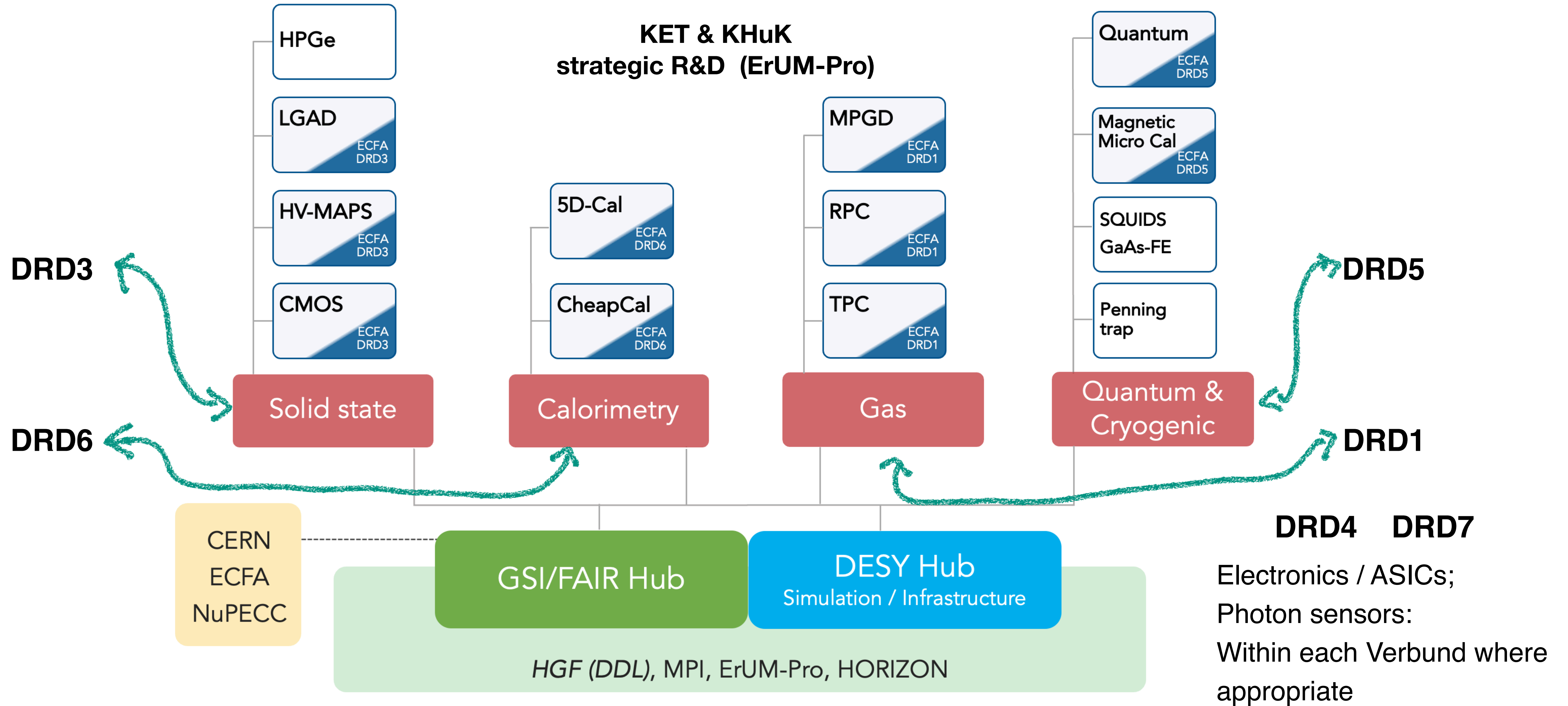
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- Two main topics  
(using High-D nomenclature):

- “5D Calorimetry”
- “Cheap Cal”



mapping on DRD6 tracks:

Sandwich calorimeters with fully embedded Electronics  
Optical calorimeters

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mapping on DRD6 tracks:

Sandwich calorimeters with fully embedded Electronics

Optical calorimeters

Main directions / topics tbd. A few key words:

*Development of SiPM-on-tile AHCAL concept for circular colliders:*

- continuous readout -> readout, powering, cooling concept
- precision timing: “5D” - calorimetry - challenges, physics benefits
- construction of a prototype sufficient to contain EM showers

*Development of calorimeter concepts to cover large areas in a cost-effective manner:*

- scintillator materials & geometries
- replacements for WLS fibers: materials, coatings,...

Common elements:

- Readout ASIC: KlauS
- electronic readout chain
- SiPMs as photon sensors
- reconstruction and simulations
- ...

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DRD6 Track 4



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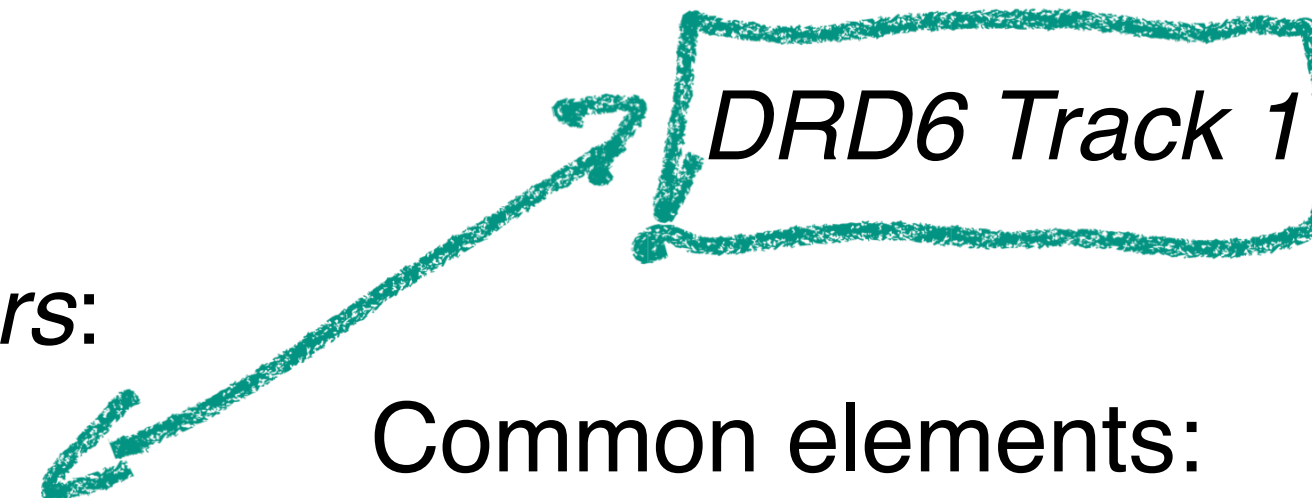
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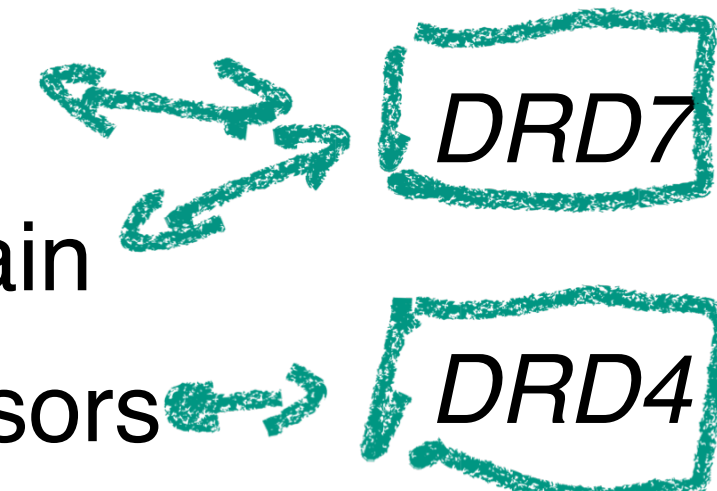
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# Interested?

*Get in touch with me!*

*Preparations for the next FP are starting now - first meeting in 2 weeks.*

# Extras

# Requirements

## Facility-dependent

