



Spokesperson's Welcome

Roman Pöschl



CALICE Collaboration Meeting Prague – September 2023



- Academic excellency

Three reasons to come to Prague



- Academic excellency
- A magnificent city

Three reasons to come to Prague



- Academic excellency
- A magnificent city
- Lowest beer prices in Europe



- On behalf of the collaboration I would like to thank the FZU Prague for hosting us for this meeting
 - We are honoured by the welcome of the FZU Director Prof. Michael Prouza
 - I would like to thank Ivo, Jiri and Jaroslav for the local organisation
 - Second Meeting in Prague, first one 2007, <https://agenda.linearcollider.org/event/1785/>
- The group of Prague is CALICE member since 2006
 - Silicon sensors for SiW ECAL physics prototype
 - Hardware contributions to AHCAL
 - The history of calorimetry at FZU will be recapitulated by Jaroslav
- Thanks to the conveners for having compiled the program
- Thank you very much for coming to this CALICE Meeting or for online-participation
 - ... again with participants from three continents on-site



- †2020
- One of the founding members of CALICE
- An eminent person for the calorimeter effort at FZU
 - See also talk by Jaroslav Cvach
- CALICE owes him a lot and I would like to dedicated this meeting to him



- This meeting is supported by FOTON and in the name of CALICE I would like to express our appreciation
- Jaroslav Moravec will introduce FOTON after the opening session

Opening Slide of Ivo's talk 2007

A fast LED driver prototype for HCAL calibration

CALICE meeting Prague

- Further speakers 2007
 - Felix Sefkow
 - Manqi Ruan
 - Andy White
 - R.P.
- All of which are here today
 - Plus speakers who are not here but are still members of CALICE

- Unfortunately the situation hasn't got better since our last meeting in March 2023
- Reminder: As of March 17th 2022 Russian Institutes have been excluded from the CALICE Institution Board
- Discussions in CERN Council on future of International Cooperation Agreement with the Russian Federation, JINR and the Republic of Belarus (all end during) 2024
- **Meanwhile we have adapted our publication strategy**
 - Russian colleagues appear with their names but w/o their institutes
 - Institutes in acknowledgement for funding
- Personal remark: Despite the rightful sanctions imposed on Russian Institutes it is important to keep open channels for communication and scientific collaboration

- Since the two collaboration meetings the Chair of the Speakers Bureau moved from

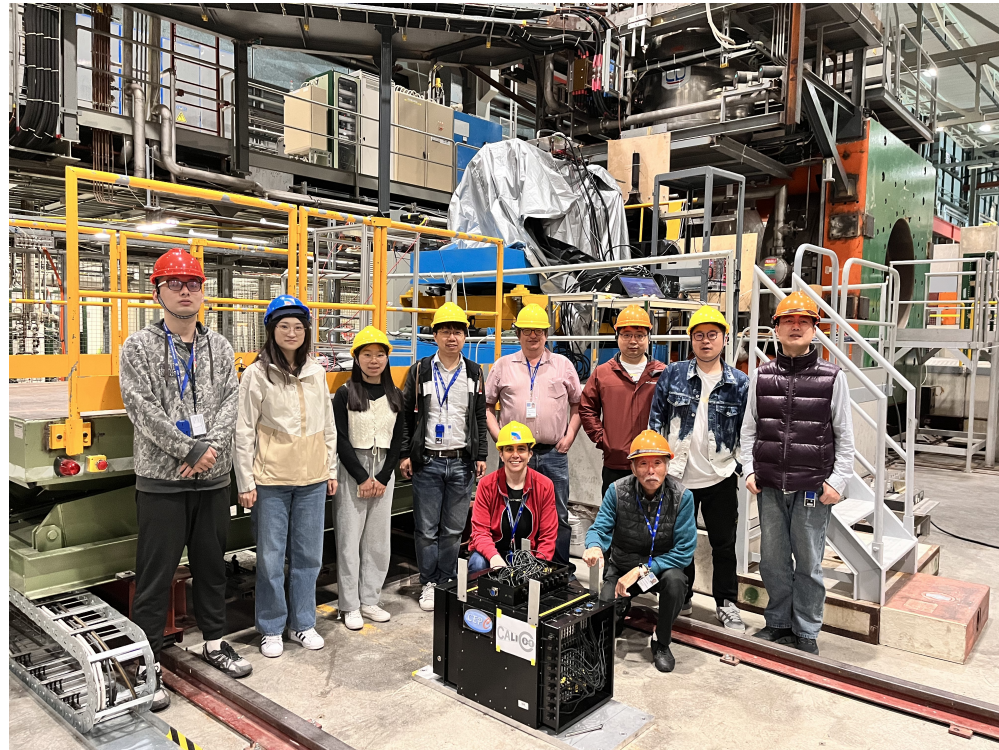
François Corriveau

to

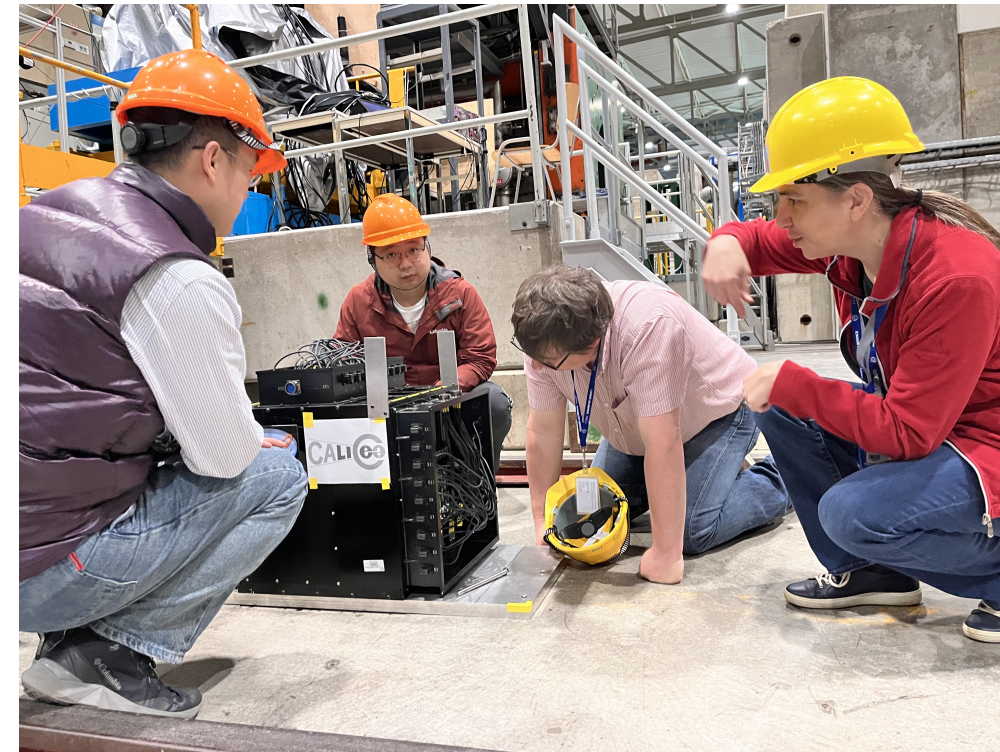
Wataru Ootani

- Let us thank once more François for his excellent job and thank Wataru for taking over this very important position

Group Picture



Detailed Explanations



- **ScW ECAL and AHCAL (CEPC)**
 - Beam time at SPS and PS in April/May 2023
 - Further data taking next week
 - This is good!

The SiW Ecal was part of an instrumentation school at iThemba Labs just before TIPP 2023
<https://indico.tlabs.ac.za/event/121/timetable/#20230901.detailed>

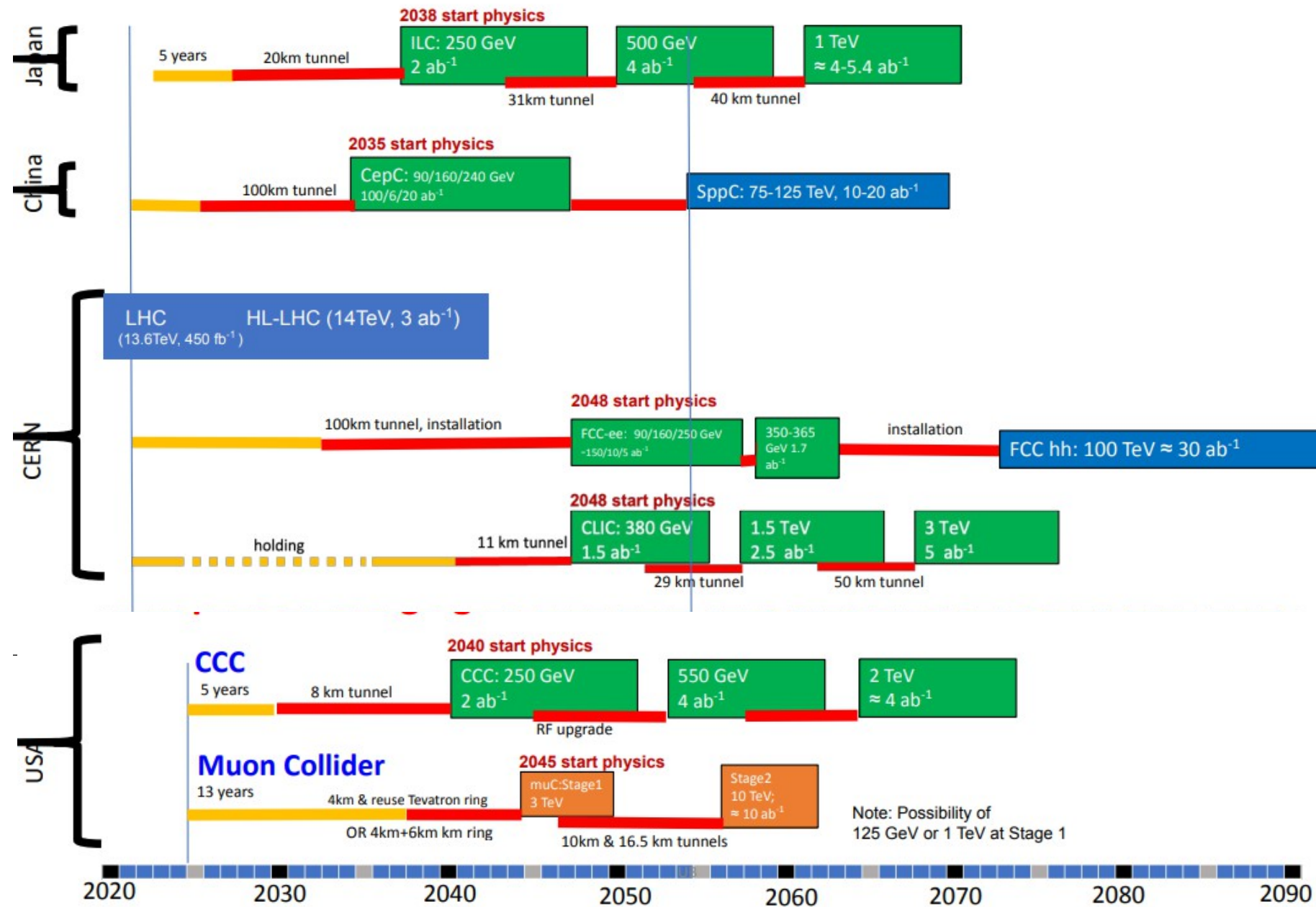


- 20-25 Students operated a detector layer using the same interface that we also use in beam test
 - A major side effect is that iThemba Labs is about to join CALICE
- Message : Our devices could and should be part of training and outreach!
 - To be consolidated

Indicative scenarios of future colliders [considered by ESG]

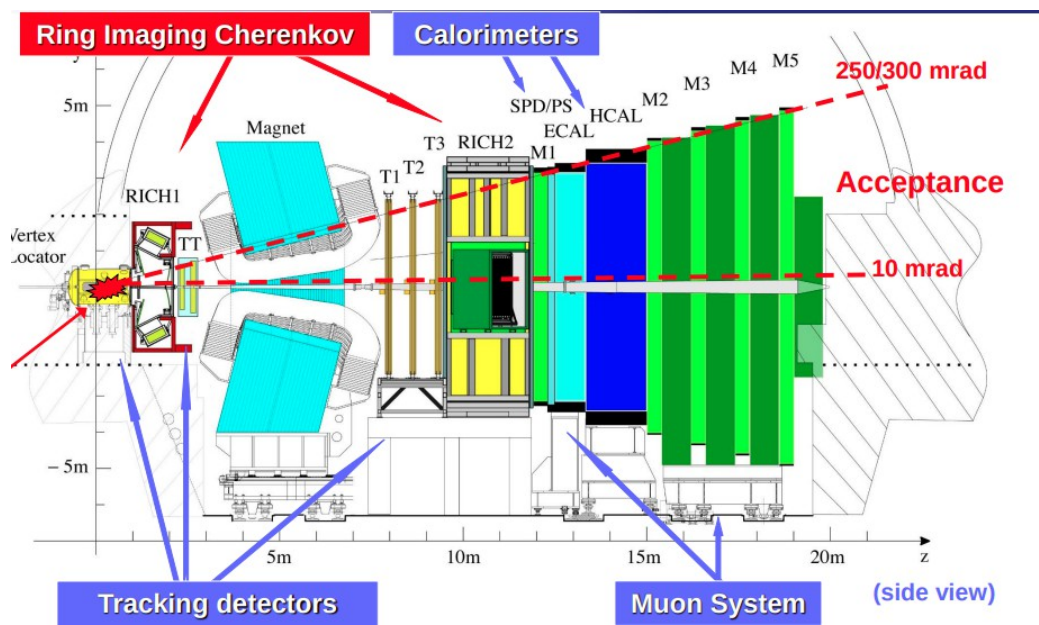


Original from ESG by UB
Updated July 25, 2022 by MN

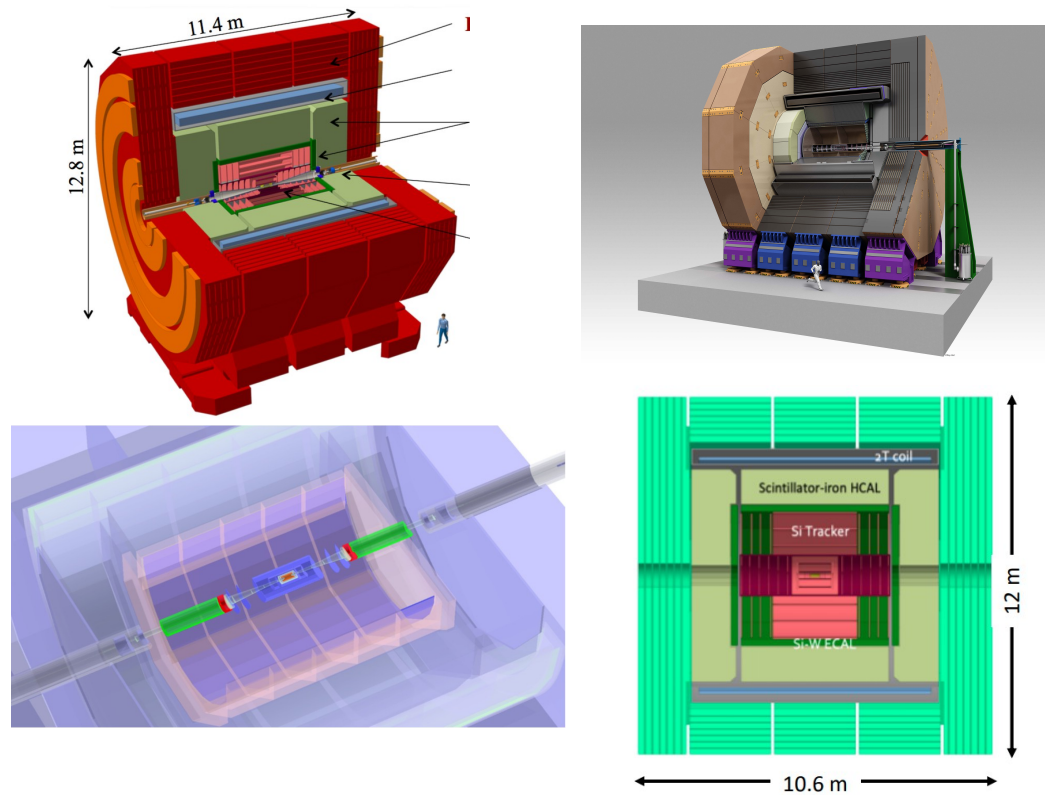


- The landscape is a plethora of linear and circular machines of various types
- The R&D in CALICE and beyond has to mirror that
- Not easy since partially diametral opposite boundary conditions

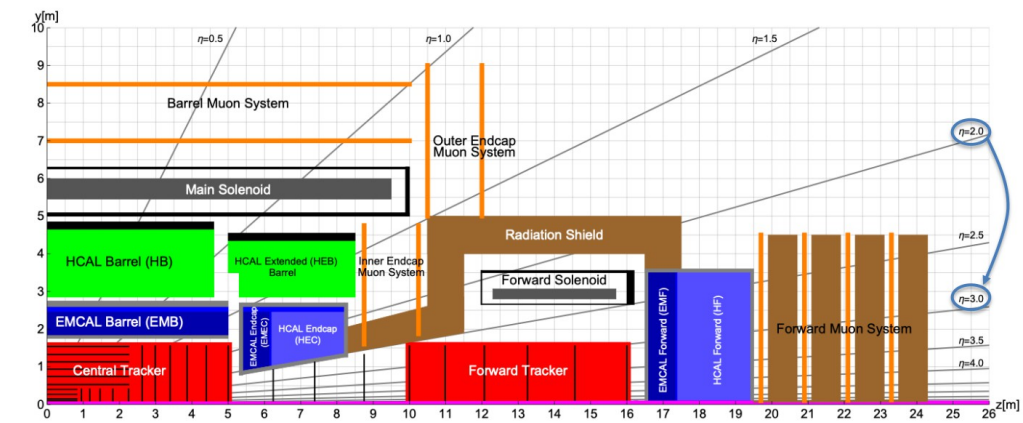
HL-LHC after LS4



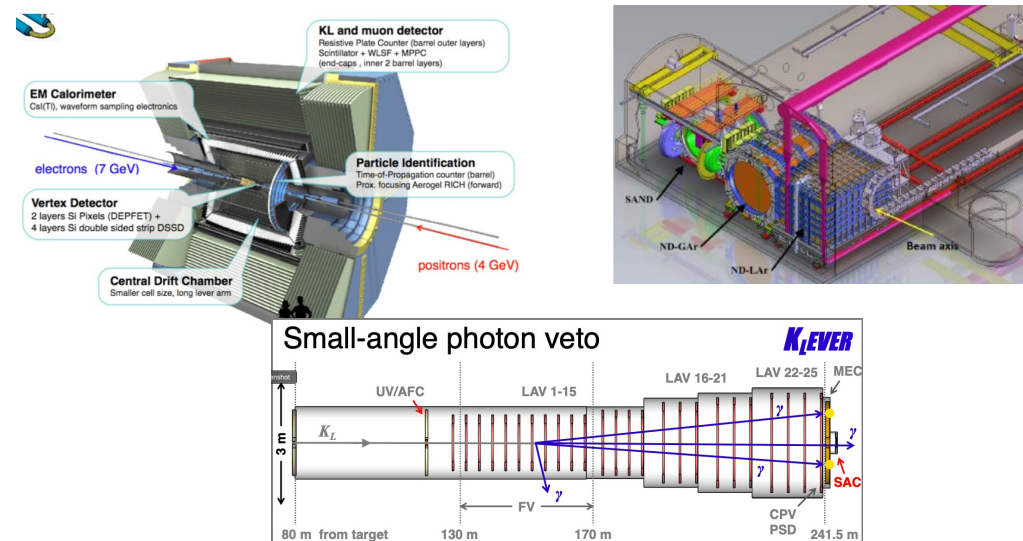
Higgs Factories



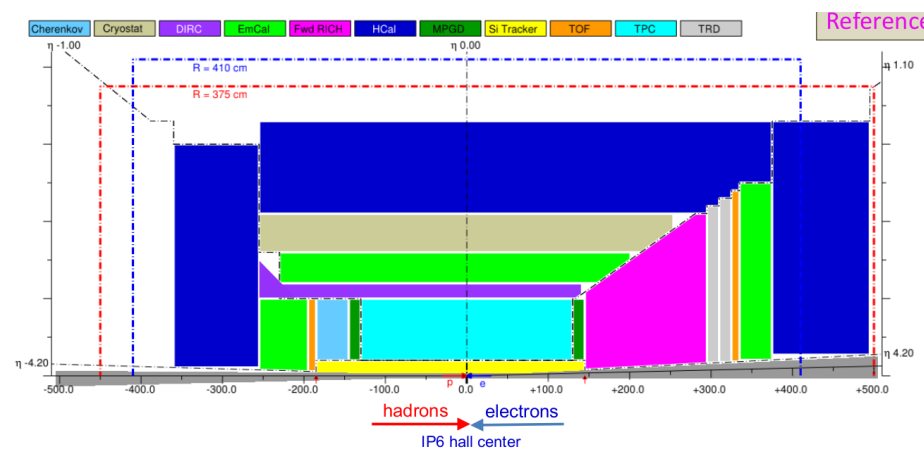
Future hadron colliders (including eh colliders)



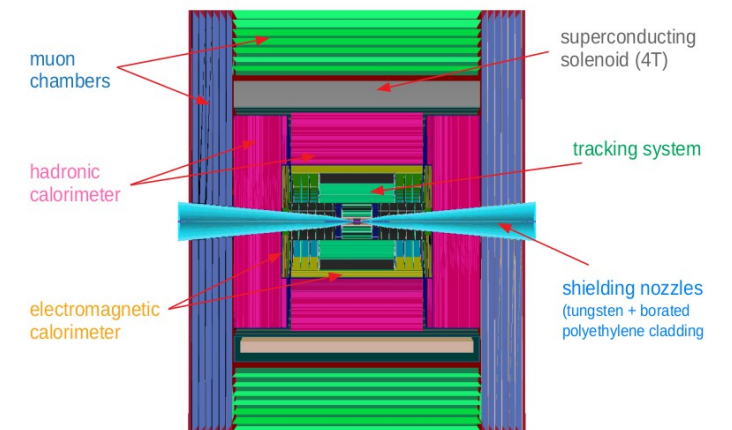
SuperKEKB, DUNE ND and Fixed Target



EiC



Muon Collider

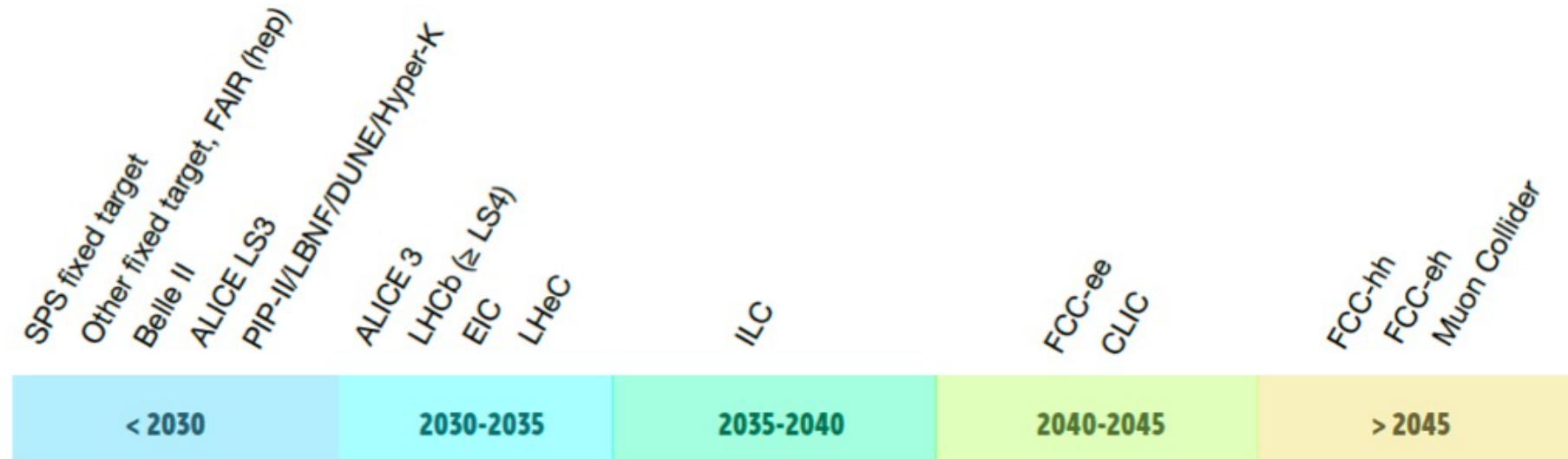


- **ECFA R&D Roadmap**
 - CERN-ESU-017 <https://cds.cern.ch/record/2784893>
 - 248 pages full text and 8 page synopsis
- Endorsed by ECFA and presented to CERN Council in December 2021
- The Roadmap has identified
 - General Strategic Recommendations (GSR)
 - Detector R&D Themes (DRDT) for each of the taskforce topics
 - Concrete R&D Tasks
- Timescale of projects as approved by European Lab Director Group (LDG)



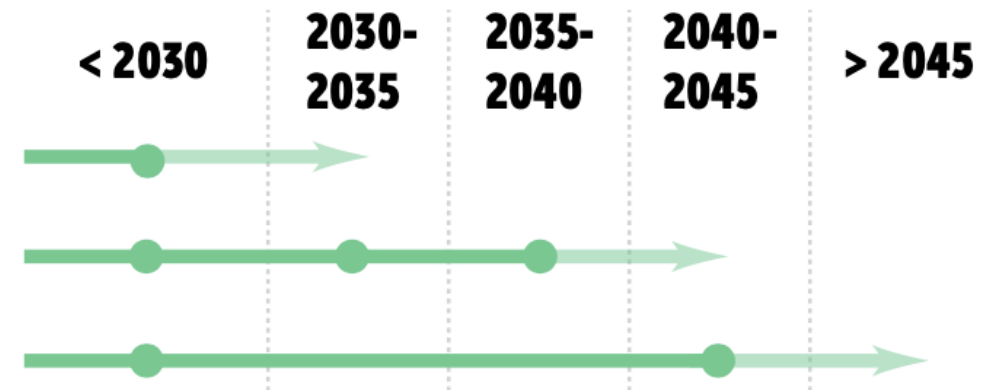
Guiding principle: Project realisation must not be delayed by detectors



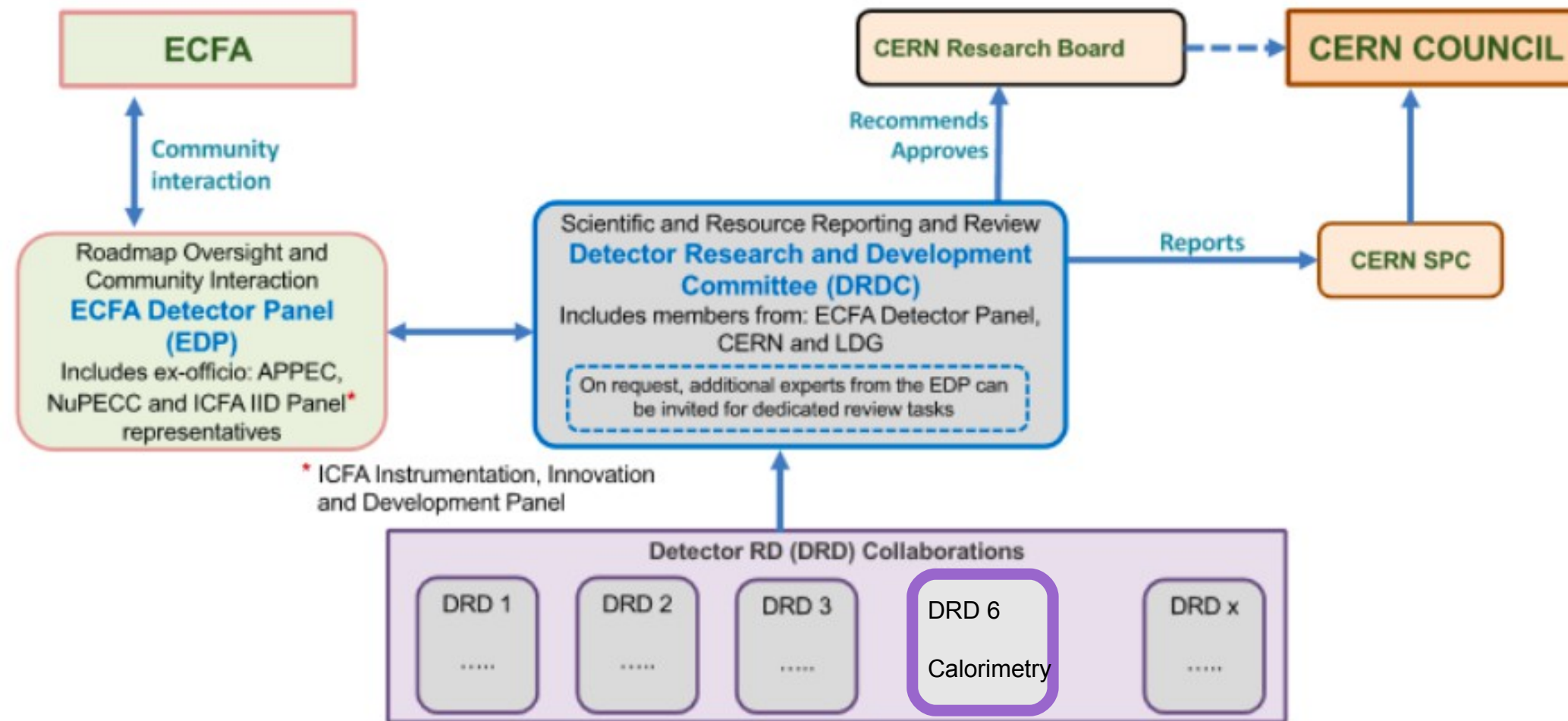


Calorimetry

- DRDT 6.1** Develop radiation-hard calorimeters with enhanced electromagnetic energy and timing resolution
- DRDT 6.2** Develop high-granular calorimeters with multi-dimensional readout for optimised use of particle flow methods
- DRDT 6.3** Develop calorimeters for extreme radiation, rate and pile-up environments



- The **D**etector **R**&**D** **T**hemes and the provisional time scale of facilities set high-level boundary conditions
- See backup slides for detailed R&D tasks



- **Current model: DRD will be hosted by CERN and therefore become legally CERN collaborations**
 - Significant participations by non-European groups is explicitly welcome and needed
 - World wide collaborations!
- **The progress and the R&D will be overseen by a DRDC that is assisted by ECFA**
 - <https://committees.web.cern.ch/drdc>
 - Thomas Bergauer of ÖAW/Austria appointed as DRDC-Chair
 - Petra Merkel of FNAL Member of DRD-C
- **The funding will come from national resources (plus eventually supranational projects)**

Through 2023, mechanisms will need to be agreed with funding agencies in parallel to the process below for country specific DRD collaboration funding requests for Strategic R&D and for developing the associated MoUs.

- | | |
|-------------------|---|
| Q4 2022 | Outline structure and review mechanisms agreed by CERN Council.
Detector R&D Roadmap Task Forces organise community meetings to establish the scope and scale of community wishing to participate in the corresponding new DRD activity.
(Where the broad R&D topic area has one or more DRDTs already covered by existing CERN RDs or other international collaborations these need to be fully involved from the very beginning and may be best placed to help bring the community together around the proposed programmes.) |
| Q1 2023 | DRDC mandate formally defined and agreed with CERN management; Core DRDC membership appointed; and EDP mandate plus membership updated to reflect additional roles. |
| Q1-Q2 2023 | Develop the new DRD proposals based of the detector roadmap and community interest in participation, including light-weight organisational structures and resource-loaded work plan for R&D programme start in 2024 and ramp up to a steady state in 2026. |
| Q3 2023 | Review of proposals by DRDC leading to recommendations for formal establishment of the DRD collaborations. |
| Q4 2023 | DRD Collaborations receive formal approval from CERN Research Board . |
| Q1 2024 | New structures operational for ongoing review of DRDs and R&D programmes underway. |

We are here →

Through 2024, collection of MoU signatures

- **Entry point, “DRD Calo indico page”**: <https://indico.cern.ch/category/12772/>
 - Information on important events and access to relevant documents
 - 233 people from four regions registered so far
- **1st Community Meeting 12/1/23**
 - <https://indico.cern.ch/event/1212696/>
- **Proposal phase until 31st of July 2023**
 - **Input-proposals collected until 1st of April 2023**
 - **2nd Community Meeting 20th April**
 - <https://indico.cern.ch/event/1246381/>
 - Presentation of summaries of input-proposals (w/o disclosing confidential information)
 - Presentation of a WP Structure of DRD Calorimetry
- **Input-proposals have been condensed into a DRD on Calorimetry proposal**
 - Submitted to DRD-C on July 28th and shared with submitters of input-proposal
 - Proposal has been accompanied by a set of resource table
 - (compiled to the best of our knowledge with the help of magic bowls ;-)

Coordinators: Roberto Ferrari (INFN-Pavia), R.P.

Representative from Coordination Team: Felix Sefkow

Work Area 1: Sandwich calorimeters with fully embedded Electronics – Main and forward calorimeters

Track conveners: Adrian Irlles (IFIC, adrian.irlles@ific.uv.es), Frank Simon (KIT, frank.simon@kit.edu), Jim Brau (University of Oregon, jimbrau@uoregon.edu), Wataru Ootani (University of Tokyo, wataru@icepp.s.u-tokyo.ac.jp), Imad Laktineh (I2PI Lyon, imad.laktineh@in2p3.fr)

Work Area 2: Liquified Noble Gas Calorimeters

Track Conveners: Martin Aleksa (CERN, martin.aleksa@cern.ch), Nicolas Morange (IJCLab, nicolas.morange@ijclab.in2p3.fr), Marc-Andre Pleier (BNL, mpleier@bnl.gov)

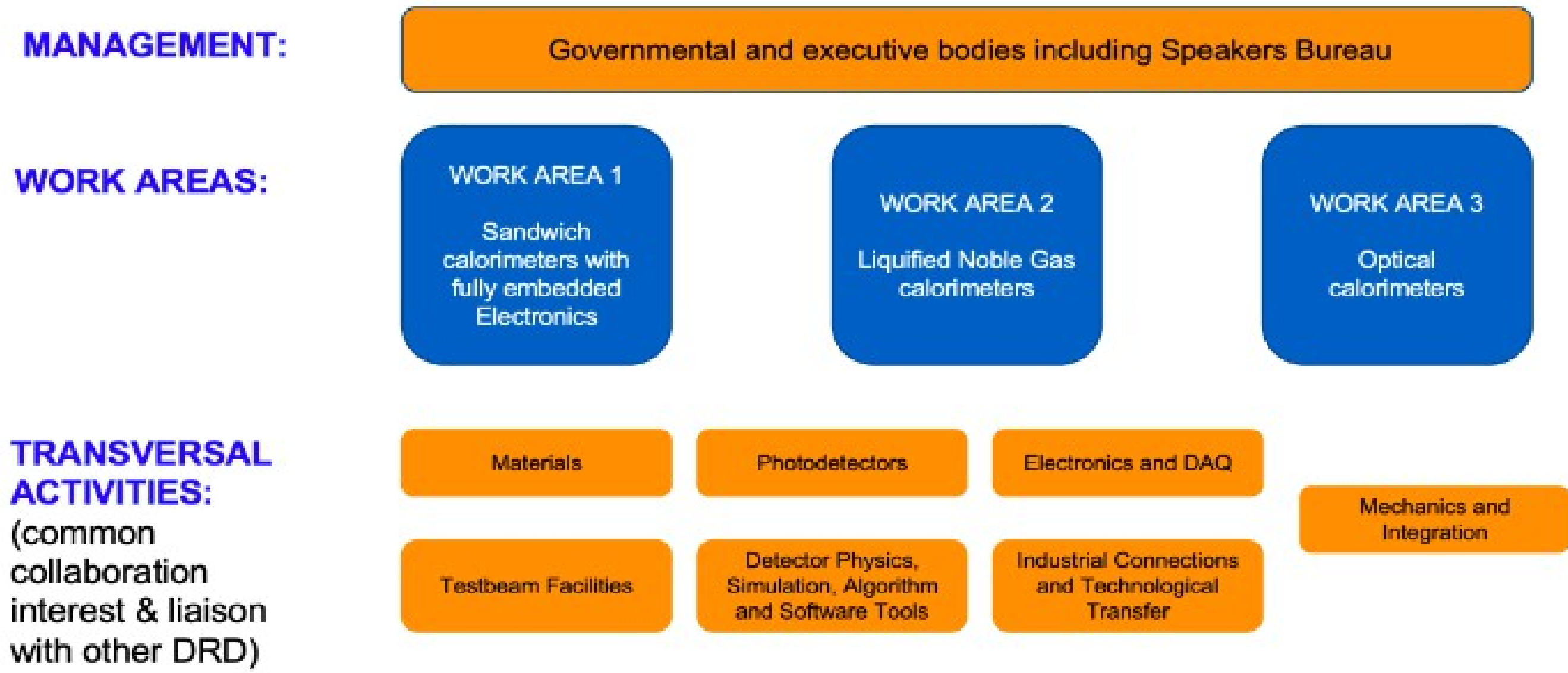
Work Area 3: Optical calorimeters: Scintillating based sampling and homogenous calorimeters

Track Conveners: Etienne Auffray (CERN, etiennette.auffray@cern.ch), Gabriella Gaudio (INFN-Pavia, gabriella.gaudio@pv.infn.it), Marco Lucchini (University and INFN Milano-Bicocca, marco.toliman.lucchini@cern.ch), Philipp Roloff (CERN, philipp.roloff@cern.ch), Sarah Eno (University of Maryland, eno@umd.edu), Hwidong Yoo (Yonsei University, hdyoo@cern.ch)

Track 4: Transversal Activities

Christophe de la Taile (taile@in2p3.fr), Alberto Gola (alberto.gola@fbk.it)

7 CALICE Members



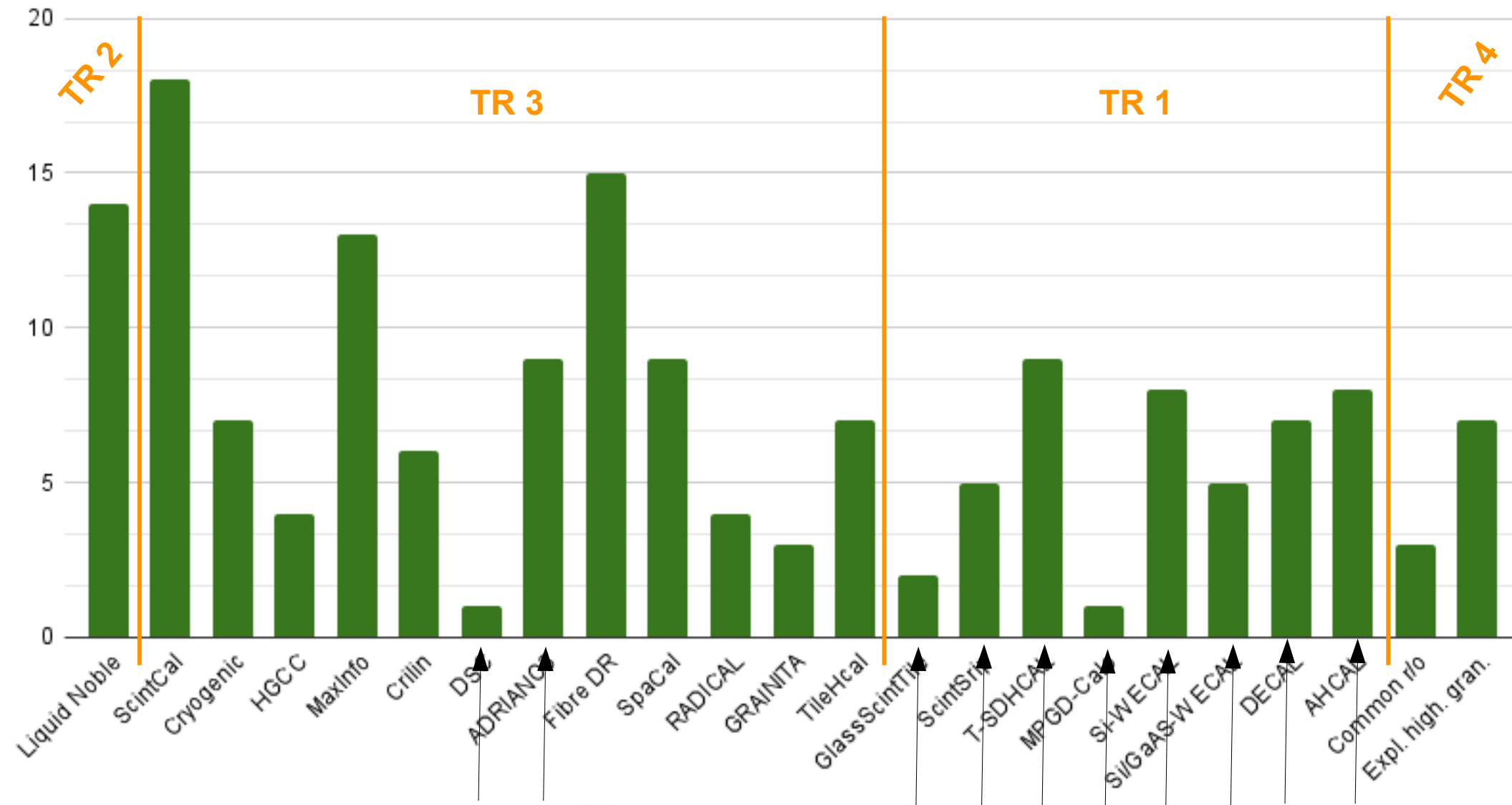
Remark: “Tracks” during proposal phase have been turned into “Work Areas” for DRD Calo Proposal (therefore for this talk “Tracks” = “Work Areas”)

Input proposals

23 comprising 110 institutes/labs received

From all over the world!!!

Institutes Per Proposal



- https://drive.google.com/drive/folders/1_xvY32h2hrcSN9TRYZZcn9fW_8PnrWd
- 24 pages
- Based on world wide community input as sketched above
- Short description of goals, projects and organisation
 - Organisational chart, see below
 - Example for table from Work Area 3 with short description

DRD 6: Calorimetry

Proposal Team for DRD on Calorimetry

July 28, 2023

Martin Aleksa¹, Etienne Auffray-Hillemanns¹, David Barney¹, James Brau², Sarah Eno³, Roberto Ferrari⁴, Gabriella Gaudio⁵, Alberto Gola⁵, Adrian Irlas⁶, Imad Laktineh⁷, Marco Lucchini⁸, Nicolas Morange⁹, Wataru Ootani¹⁰, Marc-André Pleier¹¹, Roman Pöschl¹², Philipp Roloff¹, Felix Seifow¹², Frank Simon¹³, Tommaso Tabarelli de Fatis⁸, Christophe de la Taille¹⁴, Hwidong Yoo¹⁵ (Editors)

¹CERN, Geneva, SWITZERLAND
²University of Oregon, Eugene, OR USA
³University of Maryland, College Park, MD USA
⁴INFN, Pavia, ITALY
⁵FBK, Povo, ITALY
⁶IFIC, CSIC-University of Valencia, Valencia, SPAIN
⁷IP2I Lyon, Villeurbanne, FRANCE
⁸University and INFN Milano-Bicocca, Milano, ITALY
⁹LJCLab, Université Paris-Saclay, Orsay FRANCE
¹⁰University of Tokyo, Tokyo, JAPAN
¹¹Brookhaven National Laboratory, Upton, NY USA
¹²Deutsches Elektronen-Synchrotron DESY, GERMANY
¹³Karlsruhe Institute of Technology, Karlsruhe, GERMANY
¹⁴OMEGA, Palaiseau, FRANCE
¹⁵Yonsei University, Seoul, SOUTH-KOREA

Contents

1 Introduction 3

2 Organisation of the DRD on Calorimetry 3

3 Work Area 1: Sandwich calorimeters with fully embedded electronics 5

3.1 Description 5

3.2 Projects in Work Area 1 6

3.3 Short-term applications 11

4 Work Area 2: Liquefied Noble Gas Calorimeters 11

4.1 Description 11

4.2 Objectives 11

5 Work Area 3: Optical calorimeters 12

5.1 Description 12

5.2 Activities and objectives 13

5.2.1 Homogeneous and quasi-homogeneous EM calorimeters 13

5.2.2 Radiation-tolerant sampling EM calorimeters 14

5.2.3 Hadronic sampling calorimeters 14

5.3 Milestones and deliverables 15

6 Transversal Working Groups 15

6.1 Materials 15

6.2 Photodetectors 18

6.3 Electronics and Readout 18

6.4 Testbeams plans, facilities and infrastructure 19

6.4.1 Thoughts on facilities and infrastructure 19

6.5 Detector Physics, Simulations, Algorithms and Software Tools 20

6.5.1 Data models and data management 20

6.5.2 DAQ Software 20

6.5.3 Simulation 20

6.5.4 Particle Flow Algorithms 21

6.5.5 Machine Learning approach 21

6.5.6 Industrial Connection and Technological Transfer 21

7 Path to the DRD collaboration 22

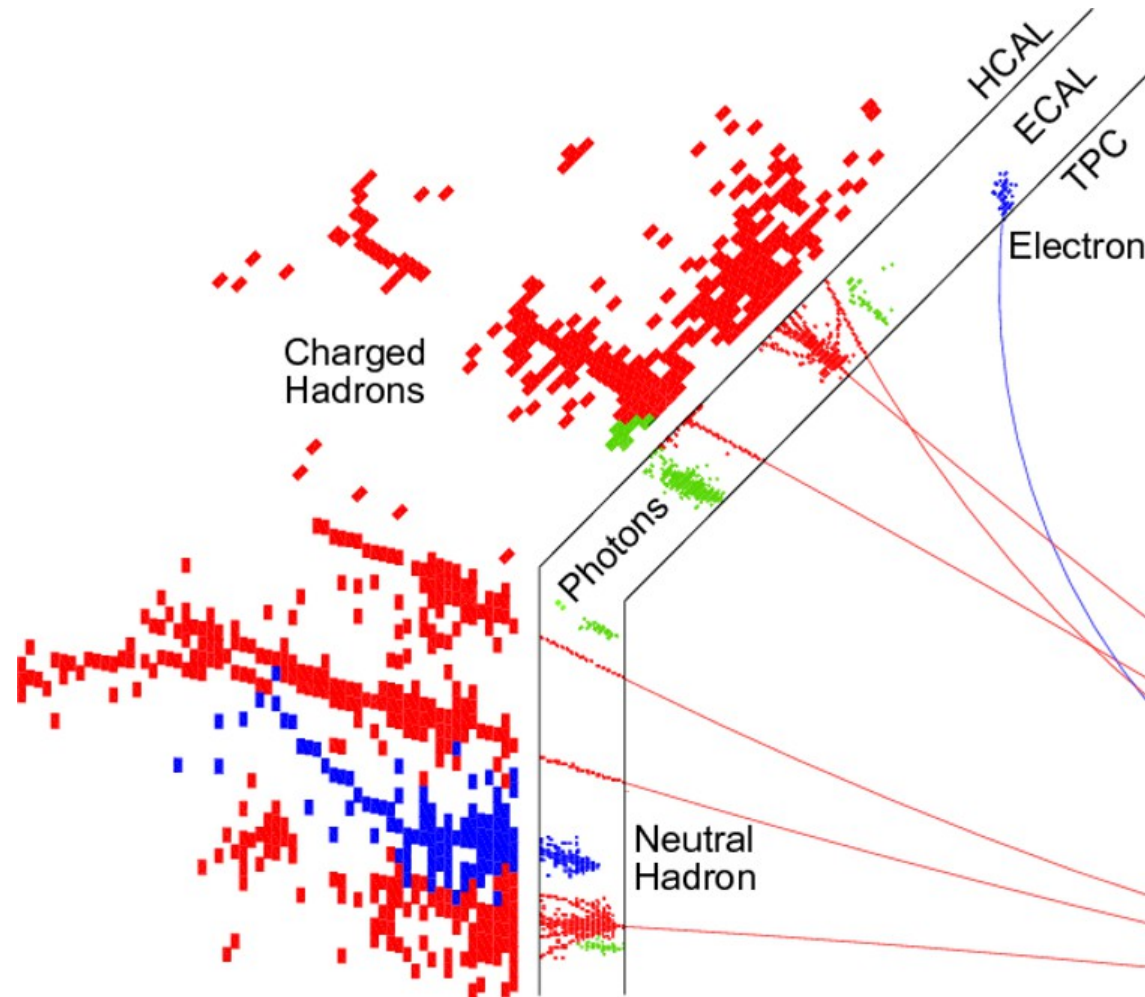
8 Conclusion 22

A Contact Persons to other DRD 22

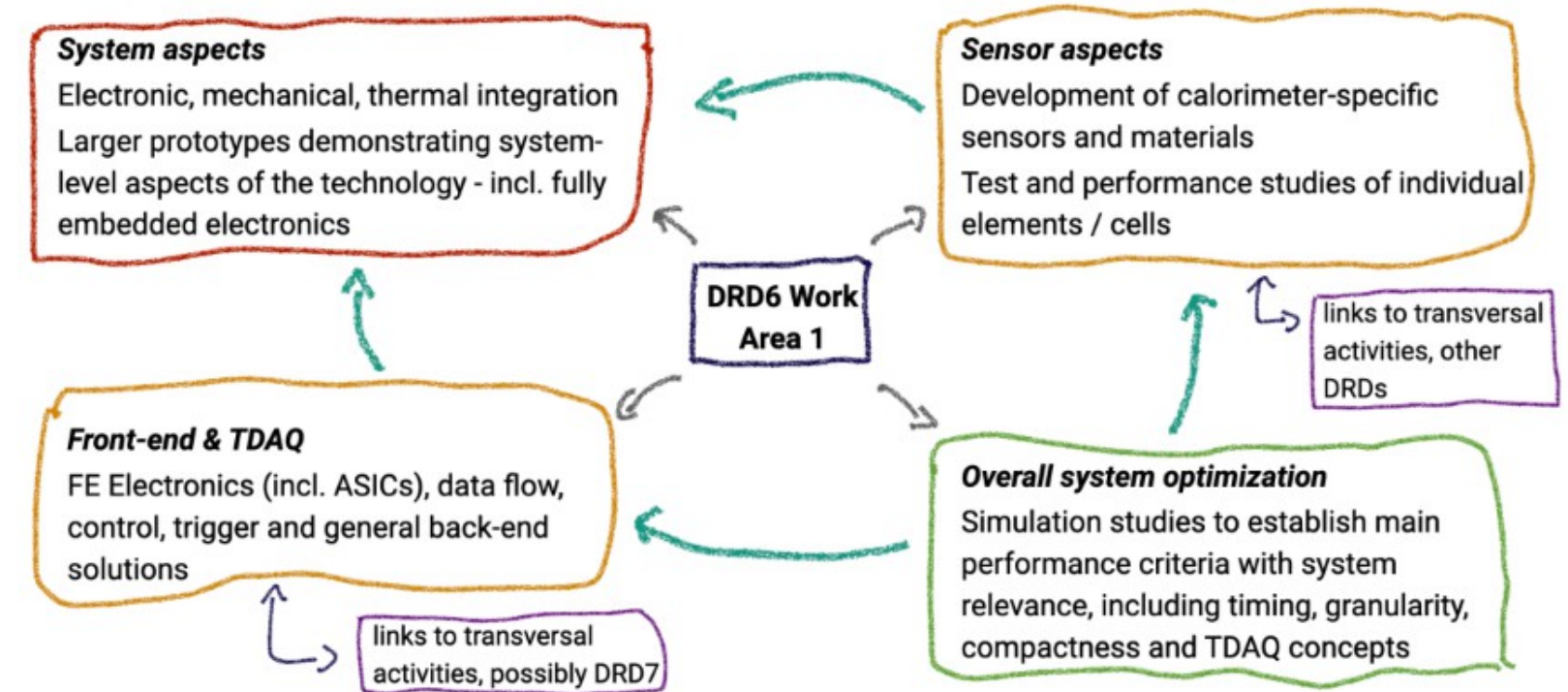
Table 2: Overview of R&D activities on optical calorimeter concepts.

Name	Calorimeter type	Application	Scintillator/WLS	Photodetector
HGCCAL	EM / Homogeneous	e^+e^- collider	BGO, LYSO	SiPMs
MAXICC	EM / Homogeneous	e^+e^- collider	PWO, BGO, BSO	SiPMs
CRILIN	EM / Quasi-Homog.	$\mu^+\mu^-$ collider	PbF ₂ , PWO-UF	SiPMs
GRAINITA	EM / Quasi-Homog.	e^+e^- collider	ZnWO ₄ , BGO	SiPMs
SPACAL	EM / Sampling	e^+e^- /hh collider	GAGG, organic	MCD-PMTs, SiPMs
RADICAL	EM / Sampling	hh collider	LYSO, LuAG	SiPMs
DRCAL	EM+HAD / Sampling	e^+e^- collider	PMMA, plastic	SiPMs, MCP
TILECAL	HAD / Sampling	e^+e^- /hh collider	PEN, PET	SiPMs

- Should be considered as first version that will be revised until ~middle/end of October 2024



Imaging calorimeters live on the high separation power for Particle Flow



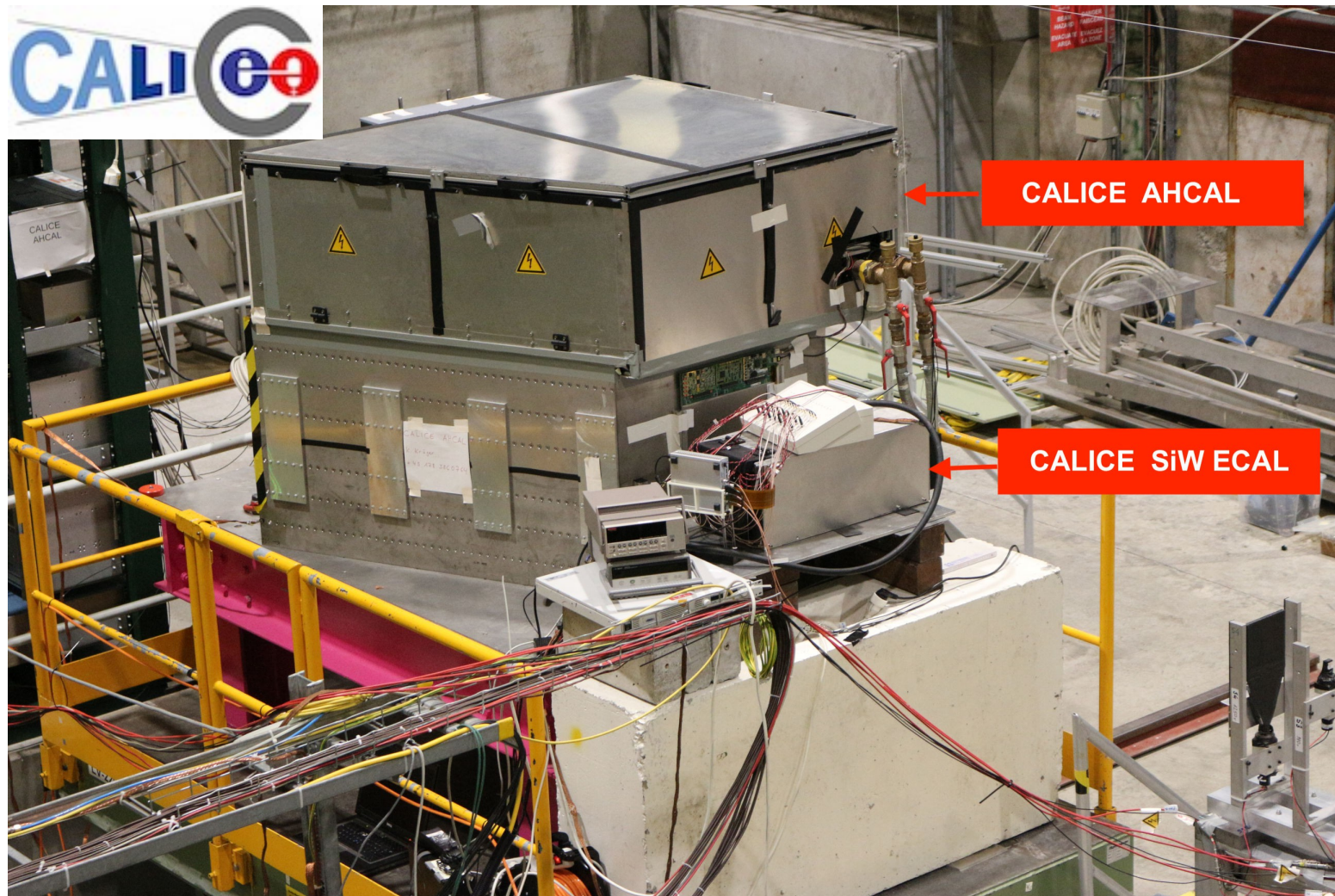
- **Challenges:**
 - High pixelisation, 4pi hermetic -> little room for services
 - Detector integration plays a crucial role
- **New strategic R&D issues**
 - Detector module integration
 - Timing
 - High rate e+e- collider (such as FCCee)

Name	Track	Active media	readout
LAr	2	LAr	cold/warm elx "HGCROC/CALICE like ASICs"
ScintCal	3	several	SiPM
Cryogenic DBD	3	several	TES/KID/NTL
HGCC	3	Crystal	SiPM
MaxInfo	3	Crystals	SiPM
CriLin	3	PbF2	UV-SiPM
DSC	3	PBBGlass+PbW04	SiPM
ADRIANO3	3	Heavy Glass, Plastic Scint, RPC	SiPM
FiberDR	3	Scint+Cher Fibres	PMT/SiPM, timing via CAENFERS, AARDVARC-v3, DRS
SpaCal	3	scint fibres	PMT/SiPM SPIDER ASIC for timing
Radical	3	Lyso:CE, WLS	SiPM
Grainita	3	BGO, ZnWO4	SiPM
TileHCal	3	organic scint. tiles	SiPM
GlassScintTile	1	SciGlass	SiPM
Scint-Strip	1	Scint.Strips	SiPM
T-SDHCAL	1	GRPC	pad boards
MPGD-Calo	1	muRWELL, MMegas	pad boards (FATIC ASIC/MOSAIC)
Si-W ECAL	1	Silicon sensors	direct with dedicated ASICs (SKIROCN)
Si/GaAS-W ECAL	1	Silicon/GaAS	direct with dedicated ASICs (FLAME, FLAXE)
DECAL	1	CMOS/MAPS	Sensor=ASIC
AHCAL	1	Scint. Tiles	SiPM
MODE	4	-	-
Common RO ASIC	4	-	common R/O ASIC Si/SiPM/Lar

Trends:

- **On-detector embedded elx.**
 - Challenges: #channels, Low power digital noise, data reduction
- **Off-detector electronics:**
 - Fibre/crystal readout
 - Challenges:
 - Low power, data reduction
- **Digital calorimetry:**
 - Challenges:
 - (extreme) #channels, low power, data reduction

Different calorimeter types but similar challenges



- Calorimeters are typically large objects
 - A beam test is similar to a small experiment
- Difficult for facility managers to schedule calorimeter beam tests
 - No concurring running with other devices possible
- Takes lots of expertise to carry out a successful beam test campaign
 - Implies use of infrastructure
- A dedicated beam line maybe with dedicated slots during a year may help curing these issues
 - Would need sustained expertise on the beamline

Common setup at CERN June 2022

Detector R&D for Higgs Factories - Input to P5

Detector R&D needs for the next generation e^+e^- collider

A. Apresyan^l, M. Artuso^v, J. Brau^q, H. Chen^d, M. Demarteau^p, Z. Demiragli^g, S. Enoⁿ,
J. Gonski^b, P. Grannis^h, H. Gray^{o,m}, O. Gutsche^l, C. Haber^m, M. Hohmann^l,
J. Hirschauer^l, G. Iakovidis^d, K. Jakobs^h, A.J. Lankford^g, C. Pena^l, S. Rajagopalan^d,
J. Strube^{o,q}, C. Tully^g, C. Vernieri^l, A. White^w, G.W. Wilson^l, S. Xie^f, Z. Ye^k, J. Zhang^b,
B. Zhou^o

^aAlbert-Ludwigs-Universität, Freiburg, ^bArgonne National Laboratory, ^cBoston University,
^dBrookhaven National Laboratory, ^eUniversity of California, Berkeley, ^fCalifornia Institute of
Technology, Pasadena, ^gUniversity of California, Irvine, ^hColumbia University, New York, ⁱFermi
National Accelerator Laboratory, ^jFlorida Institute of Technology, Melbourne, ^kUniversity of
Illinois at Chicago, ^lUniversity of Kansas, Lawrence, ^mLawrence Berkeley National Laboratory,
ⁿUniversity of Maryland, College Park, ^oUniversity of Michigan, Ann Arbor, ^pOak Ridge
National Laboratory, ^qUniversity of Oregon, Eugene, ^rPacific Northwest National Laboratory,
^sPrinceton University, ^tSLAC National Accelerator Laboratory, ^uStony Brook University,
^vSyracuse University, ^wUniversity of Texas at Arlington.

Abstract

The 2021 Snowmass Energy Frontier panel wrote in its final report “*The realization of a Higgs factory will require an immediate, vigorous and targeted detector R&D program*”. Both linear and circular e^+e^- collider efforts have developed a conceptual design for their detectors and are aggressively pursuing a path to formalize these detector concepts. The U.S. has world-class expertise in particle detectors, and is eager to play a leading role in the next generation e^+e^- collider, currently slated to become operational in the 2040s. It is urgent that the U.S. organize its efforts to provide leadership and make significant contributions in detector R&D. These investments are necessary to build and retain the U.S. expertise in detector R&D and future projects, enable significant contributions during the construction phase and maintain its leadership in the Energy Frontier regardless of the choice of the collider project. In this document, we discuss areas where the U.S. can and must play a leading role in the conceptual design and R&D for detectors for e^+e^- colliders.

Arxiv : 2306.13567

- Combined document FCC/LC
- Contents and numbers allow for synchronising activities in the US and Europe in view of the formation of DRD

Formation of RDCs

- In frame of CPAD
- CPAD Workshop 7-10 Nov. at SLAC
 - indico.slac.stanford.edu/event/8288/
- More focused on early stage R&D
- RDC9 for calorimetry

More details by Andy on Thursday

- 65 participants, 30 on site
 - Thanks to the conveners for having compiled the program
- Feedback from 2022 and 2023 beam tests, plans for 2024
 - The core of our activities
- CALICE in the new landscape: Implementation of ECFA Roadmap, toward P5
 - We have to discuss and even decide at this meeting on how to ensure smooth integration into new landscape
 - Looking forward to IB discussion
- Many models about concrete implementation of future R&D Collaborations
 - CALICE has an interest to shape these models
 - Have to understand the boundary conditions
 - Continuous requests to join CALICE --> CALICE is still attractive
 - Looking forward to the international session on Thursday
- In all cases CALICE proposes a strong program in a changing environment and will remain an reference

Electronics/DAQ: Christophe de la Taille (taille@omega.in2p3.fr), Taikan Suehara (suehara@phys.kyushu-u.ac.jp),

ECAL: Vincent Boudry (boudry@lir.in2p3.fr), Tohru Takeshita (tohru@shinshu-u.ac.jp),
Jianbei Liu (liujianb@ustc.edu.cn), Adrian Irles (adrian.irles@ific.uv.es)

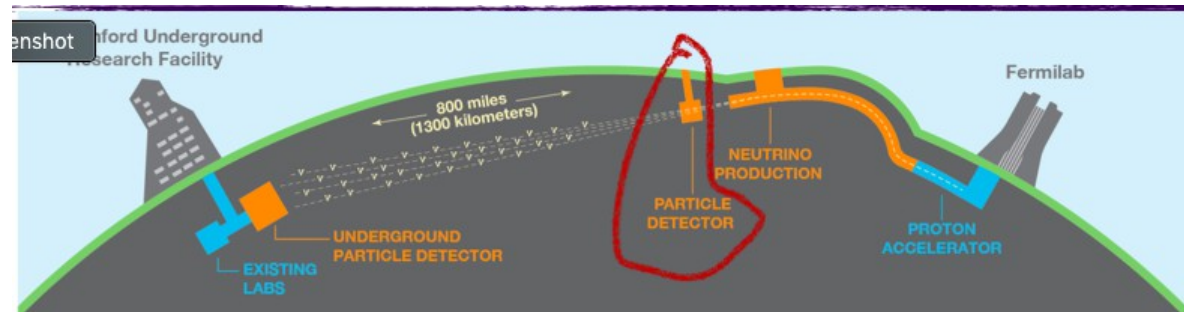
SDHCAL and DHCAL: Imad Laktineh (laktineh@ipnl.in2p3.fr), Burak Bilki (Burak.Bilki@cern.ch)

AHCAL: Katja Krüger (katja.krueger@desy.de), Yong Liu (liuyong@ihep.ac.cn)

Analysis: Gerald Grenier (gerald.grenier@in2p3.fr), Wataru Ootani (wataru@icepp.s.u-tokyo.ac.jp)

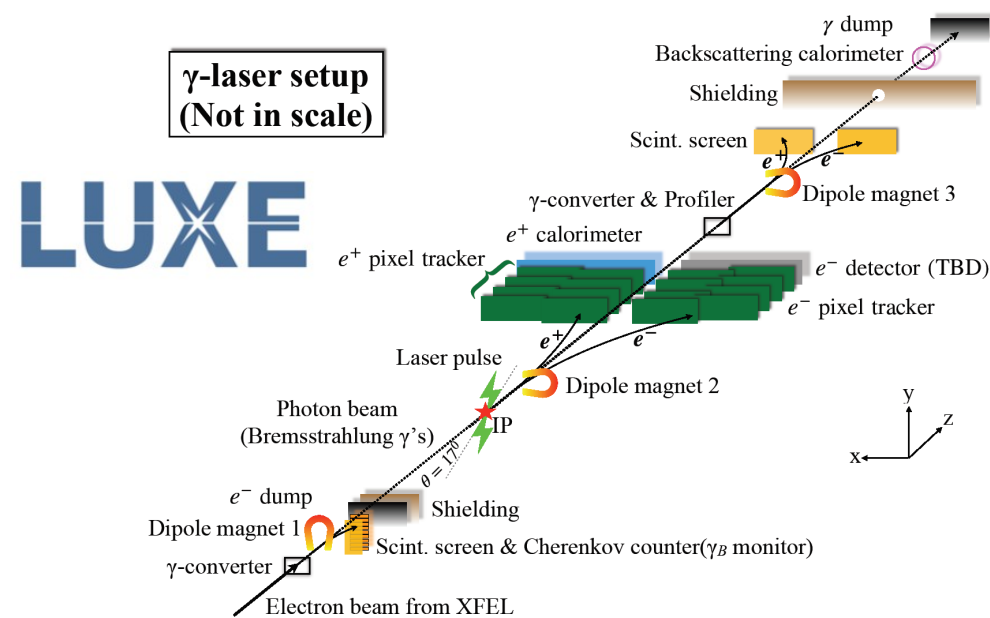
Other Applications: Roman Pöschl (roman.poeschl@ijclab.in2p3.fr), Ivo Polak (polaki@fzu.cz),
Jiri Kvasnicka (kvas@fzu.cz), Jaroslav Cvach (cvach@fzu.cz)

Backup



- DUNE Near Detector
 - Scintillator tiles/srtips

- Smaller experiments on dedicated topics
 - LUXE (Experiment at DESY XFEL to test QED)
 - See W. Lohmanns talk at CALICE Spring 2021 Meeting
 - Beam dump experiments
 - See Taikan's talk at this meeting
 - These need rather the compact elm. protoypes
- Recently the idea was brought up of continuous use of prototypes to test GEANT4 and to constitute platform for machine learning algorithms



- The CNRS/IN2P3 and the German Helmholtz Association are about to found a common research laboratory



DMLAB CNRS HELMHOLTZ DARK MATTER LAB

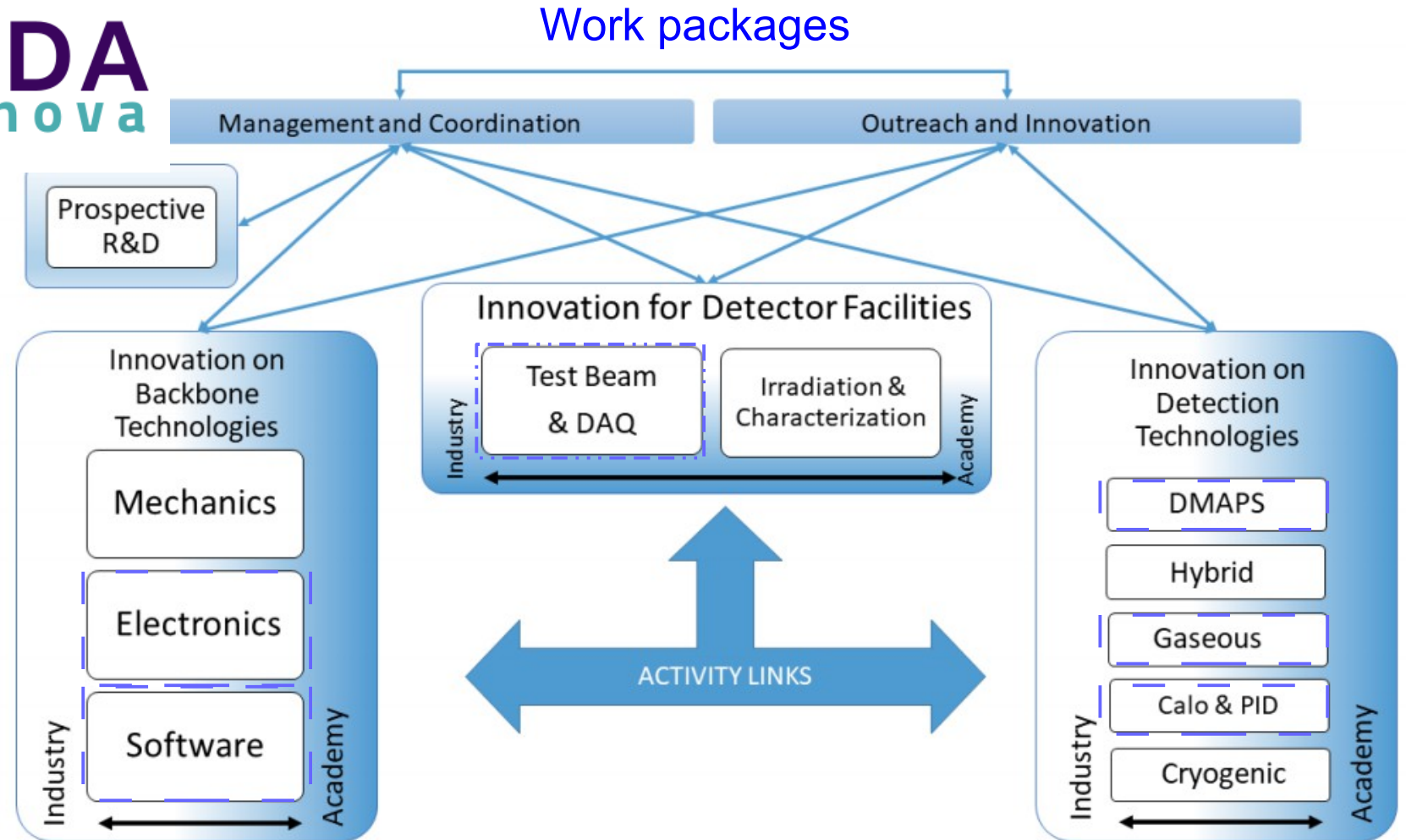
CNRS/IN2P3, DESY, FZ JÜLICH, GSI AND KIT

- DMLAB created technically by CNRS
- MOU under negotiation
- Particle Flow Calorimetry among scientific projects within this IRL
 - Topic carried by CALICE Members
- Kick-off planned 2021

Map of participants

45 Partners
15 Countries
8 Industrial companies
3 Research & Technology Org.

Legend:
● Academia
● Industry
● RTOs



- European project for detector development targeting advanced communities
 - To unfold synergies and enhance coherence in European detector R&D
- Project started on April 1st 2021
 - First Annual Meeting 28-31 of March 2022 <https://indico.cern.ch/event/1003419/timetable/#20210413.detailed>
- Close coordination with European Detector R&D Roadmap and developments in other regions
- CALICE activities spread over several workpackages

- On January 24th 2022 CALICE has signed the Diversity Charter formulated by ECFA-NUPECC-APPEC



Diversity Charter Agreement

The CALICE Collaboration agrees to support the Diversity Charter of APPEC, ECFA and NuPECC in all its contents and to provide the monitoring data as indicated in it.

Date and place, Orsay, 24/01/22

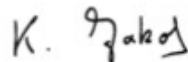


Roman Pöschl, IJCLab
Spokesperson of the CALICE Collaboration

Representative and
Organisation name



Andreas Haungs
Chair of APPEC



Karl Jakobs
Chair of ECFA



Marek Lewitowicz
Chair of NuPECC

- More details on the Charter under
- Version of 23rd June 2021
 - Signed version takes into account concerns formulated by CALICE w.r.t. first version from Summer 2020
- Let me thank the sub-panel for their collaboration on this topic
 - Three meetings since Autumn 2020
 - Lucie Linssen, Jihane Maalmi, Marina Chadeeva, MaryCruz Fouz, Marisol Robles, Lucia Masetti, Erika Garutti, Frank Simon Francois Corriveau, Taikan Suehara
- The signing comes along with obligation for monitoring certain parameters
 - The IB will be in charge of this

IF06: Calorimetry

- C.-H. Yeh, S. V. Chekanov, A. V. Kotwal, J. Proudfoot, S. Sen, N. V. Tran, S.-S. Yu, “Studies of granularity of a hadronic calorimeter for tens-of-TeV jets at a 100 TeV pp collider”, arXiv:1901.11146 [physics.ins-det] (pdf). (also under EF09)
- S. V. Chekanov, A. V. Kotwal, C.-H. Yeh, and S.-S. Yu, “Physics potential of timing layers in future collider detectors”, arXiv:2005.05221 [physics.ins-det] (pdf). (also under EF09)
- I. Pezzotti, Harvey Newman, J. Freeman, J. Hirschauer, et al. “Dual-Readout Calorimetry for Future Experiments Probing Fundamental Physics”, arXiv:2203.04312 [physics.ins-det] (pdf).
- Minfang Yeh, Ren-Yuan Zhu. “Materials for Future Calorimeters“, arXiv:2203.07154 [physics.ins-det] (pdf).
- **S. V. Chekanov, F.Simon, V. Boudry, W. Chung, P. W. Gorham, M. Nguyen, et al.** “Precision timing for collider-experiment-based calorimetry”, arXiv:2203.07286 [physics.ins-det] (pdf).
- Chen Hu, Liyuan Zhang, Ren-Yuan Zhu. “Inorganic Scintillators for Future HEP Experiments“, arXiv:2203.06731 [physics.ins-det] (pdf).
- Chen Hu, Liyuan Zhang, Ren-Yuan Zhu. “Ultrafast Inorganic Crystals with Mass Production Capability for Future High-Rate Experiments”, arXiv:2203.06788 [physics.ins-det] (pdf). (also under EF01, RF05)
- David R Winn. “Novel Low Workfunction Semiconductors for Calorimetry and Detection: High Energy, Dark Matter and Neutrino Phenomena”, arXiv:2203.09939 [physics.ins-det] (pdf).
- David R Winn, Yasar Onel. “Photomultipliers as High Rate Radiation-Resistant In-Situ Sensors in Future Experiments“, arXiv:2203.09941 [physics.ins-det] (pdf).
- T. Anderson, T. Barbera, D. Blend, N. Chigurupati, B. Cox, P. Debbins, et al. “RADICAL: Precision-timing, Ultracompact, Radiation-hard Electromagnetic Calorimetry”, arXiv:2203.12806 [physics.ins-det] (pdf). (also under EF04)
- **Randal Ruchti, Katja Krüger.** “Particle Flow Calorimetry”, arXiv:2203.15138 [physics.ins-det] (pdf). (also under EF0)
- Sergey Pereverzev, Gianpaolo Carosi, Viacheslav Li. “Superconducting Nanowire Single-Photon Detectors and effect of accumulation and unsteady releases of excess energy in materials”, arXiv:2204.01919 [quant-ph] (pdf). (also under NF0, CF0)

- In 2020 CALICE has been invited to contribute to the JENAS Recognition Working Group
 - Participation in two meetings
 - Answers to set of questions on CALICE Wikipage
 - Motivates the creation of the CALICE ECR Forum

Draft of summary report from 18/3/222

Recognition of Individuals in Large Collaborations

Summary Report

18-03-2022

APPEC-ECFA-NuPECC (JENAS) working group

Diamel Boumediene, Emmanuel Gangler, Nasser Kalantar, Karl-Heinz Kampert,
Bogna Kubik, Marcel Merk, Gerda Neyens, Eberhard Widmann

- CALICE Feedback to initial set of questions recognised in report

ECFA collaborations:

ATLAS, AWAKE, CALICE, CAST, CMS, COMPASS, DUNE, LHCb, NA61/SHINE, NA62, SoLid.

- Feedback to draft until April 20th 2022 (today)
 - A little later will hopefully not harm
 - Attached to my talk

When could we have a Higgs Factory?

Today financial and human resources (in Europe) are bound by the HL-LHC and the detector upgrades

- (HL)-LHC schedule
- LHC physics results?
- N.B. (R.P.): [What can we learn from the detector upgrades](#)

Depends on progress on R&D and projects studies:

- FCC: CERN feasibility study
- ILC: political & administrative progress in Japan, is there interest elsewhere?
- CLIC: potential plan B for Europe/CERN?
- CEPC in China?

Depends on roadmaps in various regions:

- P5 in US started with Snowmass
- Next update of the European Strategy (around 2027?)



Developing highly granular calorimetry optimised for particle flow event reconstruction for future energy-frontier electron-positron colliders.

Members of the [CALICE Collaboration](#) are encouraged to update these pages.

CALICE condemns by all means the brutal war unleashed on Ukraine by the Russian Government. We are shocked by the atrocities that we have to learn about every day. We salute those who stand with courage against this war, in Ukraine and in Russia. CALICE will remain a place for peaceful international scientific and cultural exchange.

The following measures have been implemented as a reaction by CALICE to the invasion of Ukraine by Russian Military Forces (Status: 4th of May 2022):

- The membership of Russian Institutes in the CALICE Institution Board has been suspended as of 17/3/22 and until further notice.
- Scientists affiliated to Russian institutes cannot represent CALICE at a Conference.
- For the time being, publications will be submitted to CDS, arXiv and journals given only "The CALICE Collaboration", without authors. The rules for the author lists will be reviewed in the future, with the goal of adding authors prior to the publication in journals following peer review.
- Scientists affiliated to Russian institutes cannot present at formal CALICE collaboration meetings.

For the time being, exceptions can be made if the presentation is given in an individual capacity for the CALICE collaboration, without the use of institute logos, institute email addresses or any other elements referencing Russian institutes in the slides.

- Following a request from the IB the CALICE webpage ...
- ... contains an official statement on CALICE condemnation of the war in Ukraine
- Lists of actions agreed upon in the IB