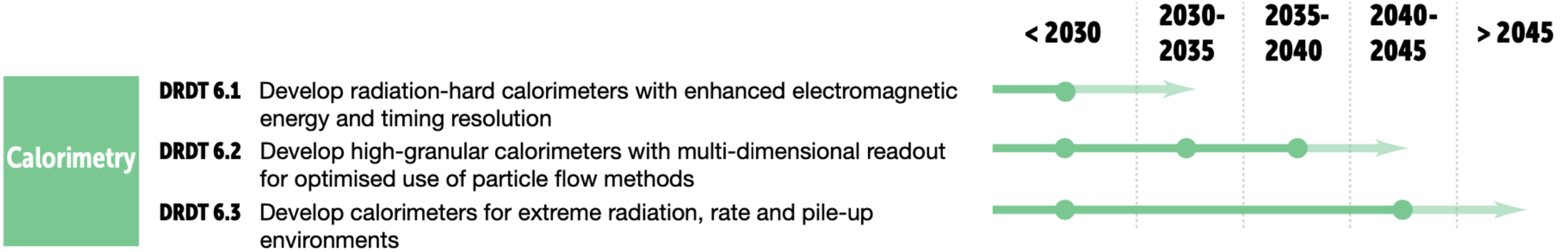
DRD-on-Calorimetry Spokespersons' Welcome

Roman Pöschl

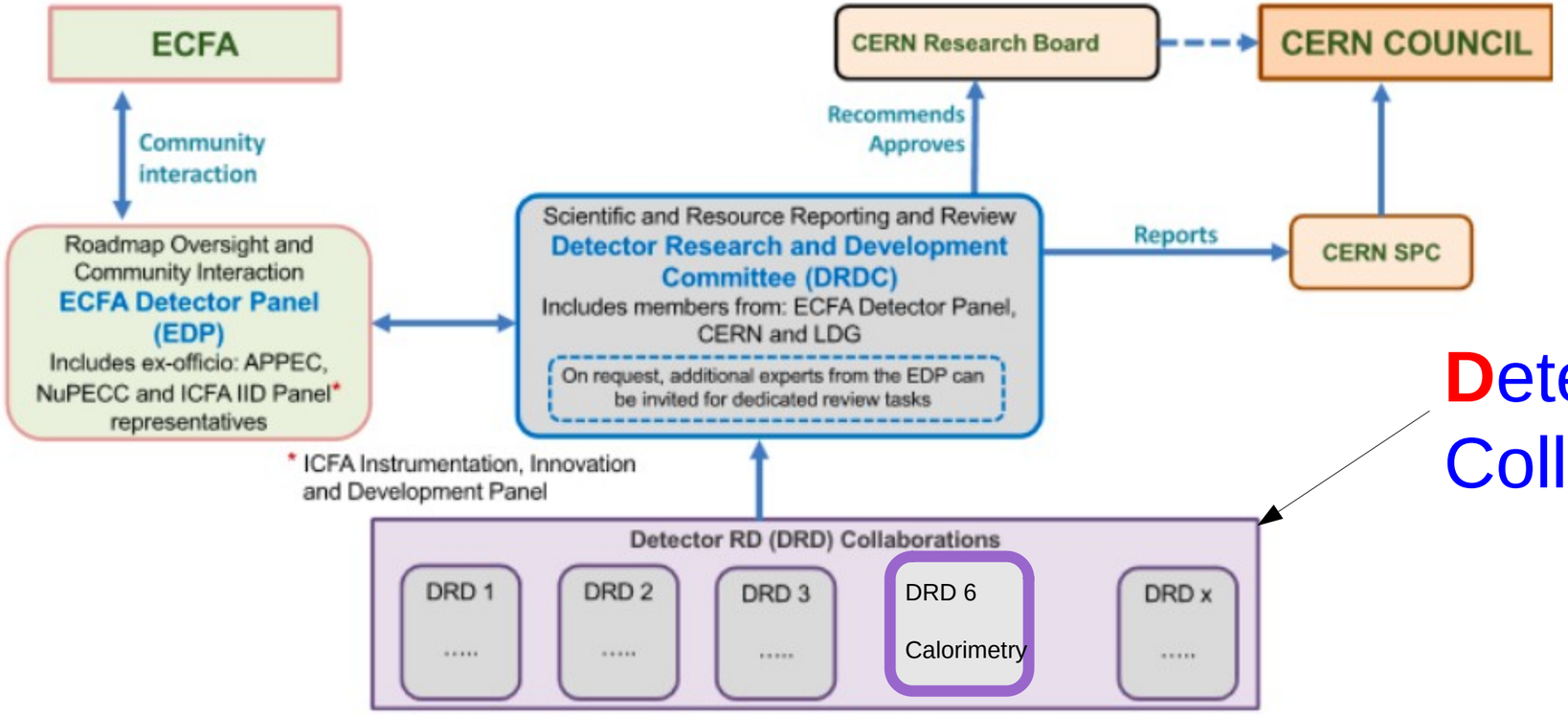
DRD Calo – Collaboration Meeting October/November 2024

Future Facilities and DRDT for Calorimetry



- 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

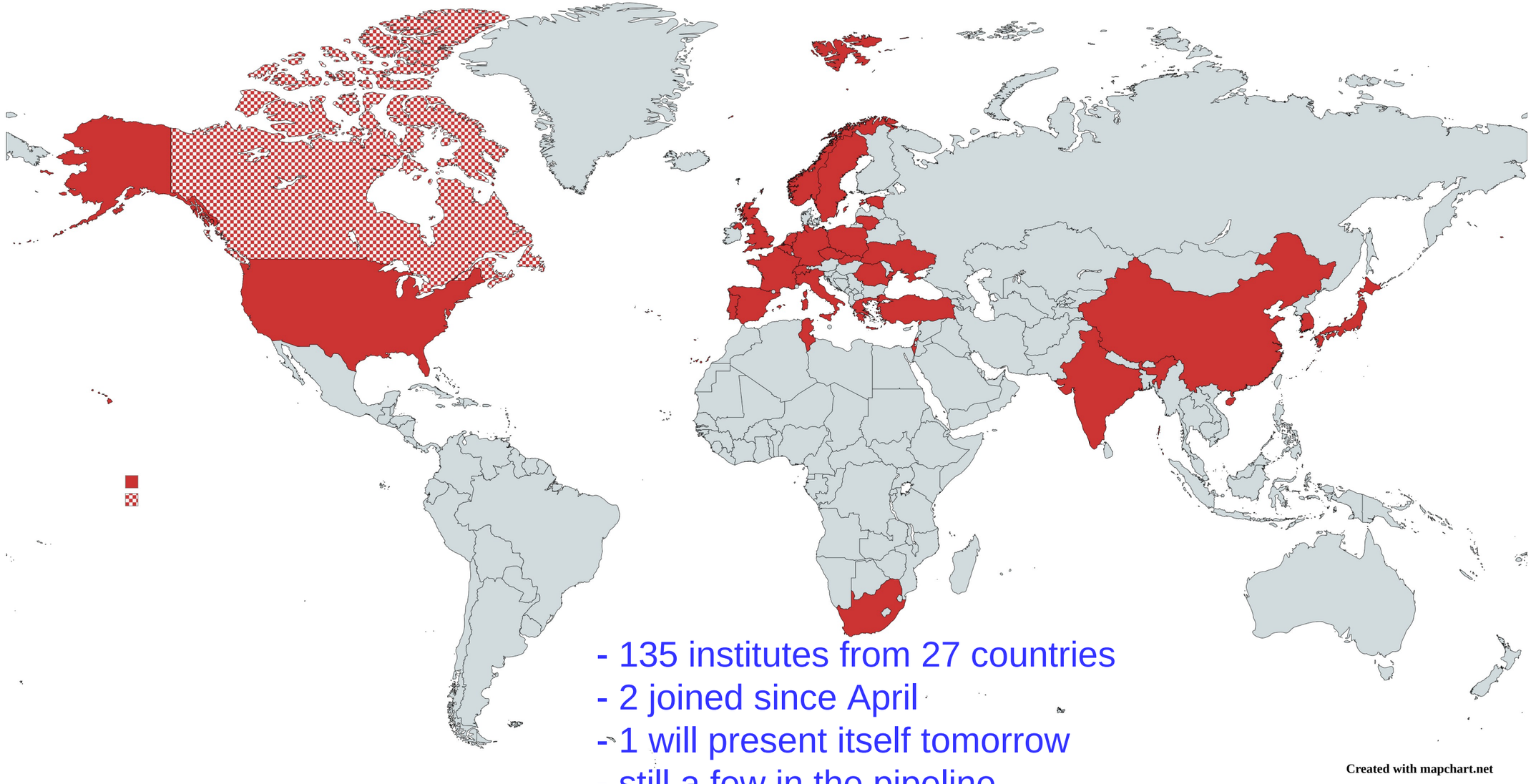
Organisation of Detector R&D (in Europe)



Detector **R**&**D** Collaborations

- DRD is hosted by CERN and therefore legal CERN collaborations
  - Significant participations by non-European groups is explicitly welcome and needed => World wide collaborations!
- The progress and the R&D is overseen by a DRDC that is assisted by ECFA
  - Thomas Bergauer of ÖAW/Austria appointed as DRDC-Chair
- The funding will come from national resources (plus eventually supranational projects)

DRD Calo – Who and where we are



- 135 institutes from 27 countries
- 2 joined since April
- 1 will present itself tomorrow
- still a few in the pipeline

Setting up the Collaboration

- Settiing up of management team (actions since last collaboration meeting)
  - Election of Spokesperson (R.P., IJCLab)
  - Election of two deputy spokespersons: Mary-Cruz Fouz (CIEMAT), Marc-Andre Pleier (BNL)
  - Election of Technical board Chair: Gabriella Gaudia (INFN-Pavia)
  - Election of Speakers and Publication Bureau Chair: Wataru Ootani (ICEPP)
  - Reminder – CB Chair Roberto Ferrari (INFN-PAvia)

- Workpackage Coordinator
  - WP1: Lucia Masettti (JGU, lead), A. Irles (deputy) [provided endorsement by CB]
  - WP2: Nicolas Morange
  - WP3: Michaela Mlynarikova (CERN), Marco Luccini (University and INFN Milano-Bicocca)
  - WP4: Christophe de la Taille (OMEGA) [provided endorsement by CB]

- Thank you very much for taking on these tasks

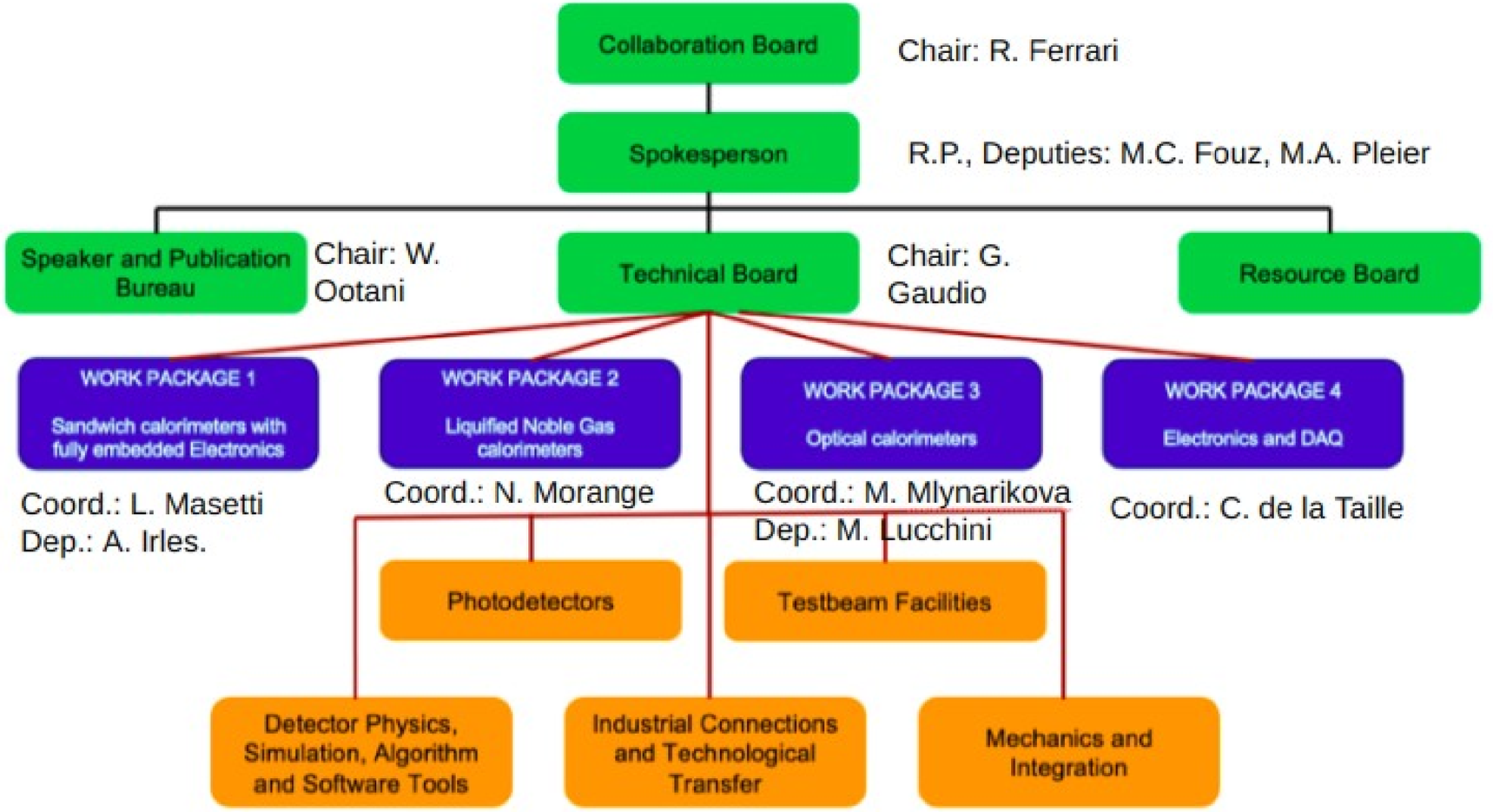
- With these elections the collaboration is operational
  - ... and we can move out from the setup phase into the working phase

Current structure

MANAGEMENT:

WORK PACKAGES:

WORKING GROUPS:



Setting up of Working Groups has started, see Gabri's talks

Setting up the Collaboration - MOU

DRDn Collaboration Memorandum of Understanding CERN-MoU-YYYY-XXX

Draft – status: 15-Oct-2024 08:12

DD Month YYYY

Memorandum of Understanding
for the
Detector Research and Development n (DRI
Collaboration
Concerning xxxx

between

THE EUROPEAN ORGANIZATION FOR NUCLEAR RESEARCH, "CERN", an Intergovernmental Organization having its seat in Geneva, Switzerland, as Host Laboratory

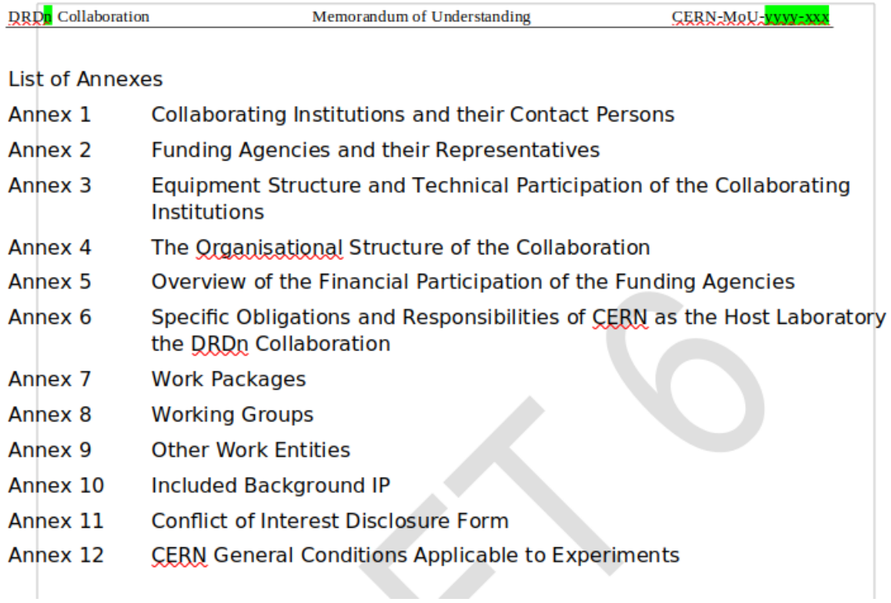
on the one hand,

and

the Collaborating Institutions/Funding Agencies of the DRDn Collaboration

on the other hand,

DD Month YYYY Page 1 of 31



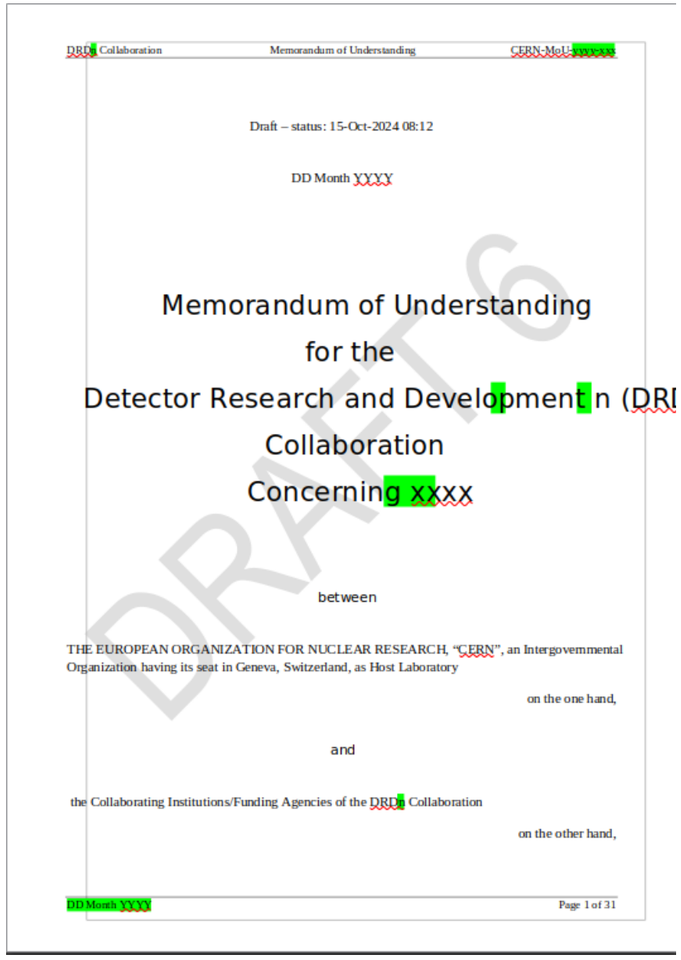
DRDn Collaboration Memorandum of Understanding CERN-MoU-YYYY-XXX

List of Annexes

Annex 1	Collaborating Institutions and their Contact Persons
Annex 2	Funding Agencies and their Representatives
Annex 3	Equipment Structure and Technical Participation of the Collaborating Institutions
Annex 4	The Organisational Structure of the Collaboration
Annex 5	Overview of the Financial Participation of the Funding Agencies
Annex 6	Specific Obligations and Responsibilities of CERN as the Host Laboratory of the DRDn Collaboration
Annex 7	Work Packages
Annex 8	Working Groups
Annex 9	Other Work Entities
Annex 10	Included Background IP
Annex 11	Conflict of Interest Disclosure Form
Annex 12	CERN General Conditions Applicable to Experiments

- The collaboration has to be formalised by signing an MOU
- MOU contains essentually two parts
  - A general part that hopefully will never (or rarely) be changed
  - Annexes that basically contains the “dynamic” part of the collaboration
- Drafts of MOUs circulated to ECFADetector Roadmap Contacts
  - ... which are supposed to inform the Funding Agencies
  - Circulation “outside” Europe?

Setting up the Collaboration – MOU Main part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DD Month YYYY Page 1 of 31

DRAFT 6

- *Author Helge Meinhard, CERN*
- *Discussion within ECFA DRD Managers Forum lead by Didier and Felix*

- DRDs are CERN Collaborations
  - ... with all its benefits and duties
  - ... and are therefore subject to CERN's General Conditions
- MOU establishes relation between CERN as host institute and collaborating institutes
- DRDs are treated as a small experiment by CERN
- Contains general approvisions (among others) on
  - e.g. what a collaboration should provide in terms of management
  - e.g. a Resource Board (see later)
  - what structures have to be in place
    - had to argue a bit to make sure that we can keep our structure
  - e.g. role and definition of Working Groups
  - e.g. how to handle intellectual properties
- Details will be discussed tomorrow in CB
- This part of MOU is to be signed by all members of the collaboration (independent whether they provide dedicated funding or not)
  - default is signing by institute
  - other equialent ways are possible

Setting up the Collaboration – Annexes of MOU

DRDn Collaboration Memorandum of Understanding CERN-MoU-yyyy-xxx

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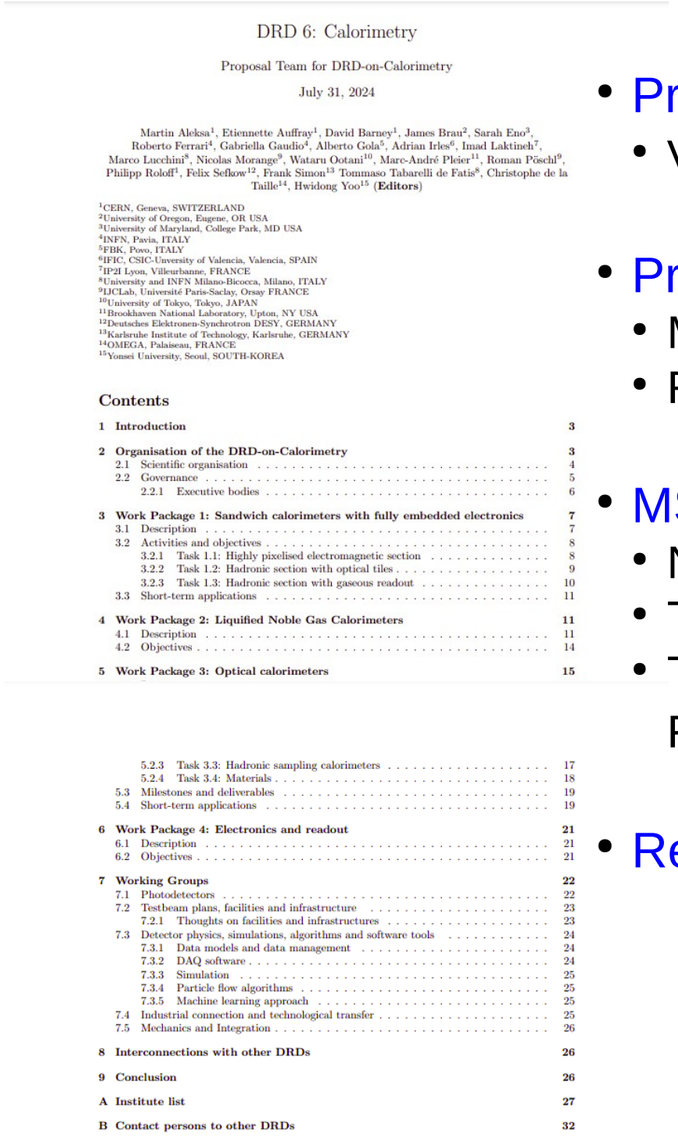
- The “dynamic” part since it will undergo changes as the collaboration develops
- Contains
  - members of the DRD
  - representatives of funding agencies
  - “by laws” = our Governance Rules -> see later
  - ... and names of persons holding responsibilities in the collaboration
  - Annex on deliverables (--> see next slide)
    - Including resources to realise these deliverables
    - These resources are to be signed by Funding Agencies (FA)
      - Funding Agency can be interpreted widely
- Will start filling annexes after the meeting

From Proposal to Reality



DRD 6: Calorimetry

Proposal Team for DRD-on-Calorimetry

July 31, 2024

Martin Aleksa[1], Etiennette Auffray[1], David Barney[1], James Brau[2], Sarah Eno[3], Roberto Ferrari[4], Gabriella Gaudio[4], Alberto Gola[5], Adrian Irles[6], Imad Laktineh[7], Marco Lucchini[8], Nicolas Morange[9], Wataru Ootani[10], Marc-André Pleier[11], Roman Pöschl[9], Philipp Roloff[1], Felix Sefkow[12], Frank Simon[13] Tommaso Tabarelli de Fatis[8], Christophe de la Taille[14], Hwidong Yoo[15] (**Editors**)

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

Contents

- Proposal: CERN-DRDC-2024-004; DRDC-P-DRD6: http://cds.cern.ch/record/2886494
  - Very minor corrections since deposit in January
- Proposal defines 40 Milestones (MS) and 39 deliverables (D)
  - MS and D are resource loaded
  - Rough estimation of resources for proposal (confidential version)
- MS and D and the associated resources will be subject to revision
  - New D can be added (of course)
  - The revised list of D will be entered in Annex 7 of MOU
  - The resources associated to the D are supposed to be signed off by Funding Agencies (=> Commitment of resources)
- Revision and its timeline will be subject to discussion in tomorrow's CB

DRD Calo – Governance Rules

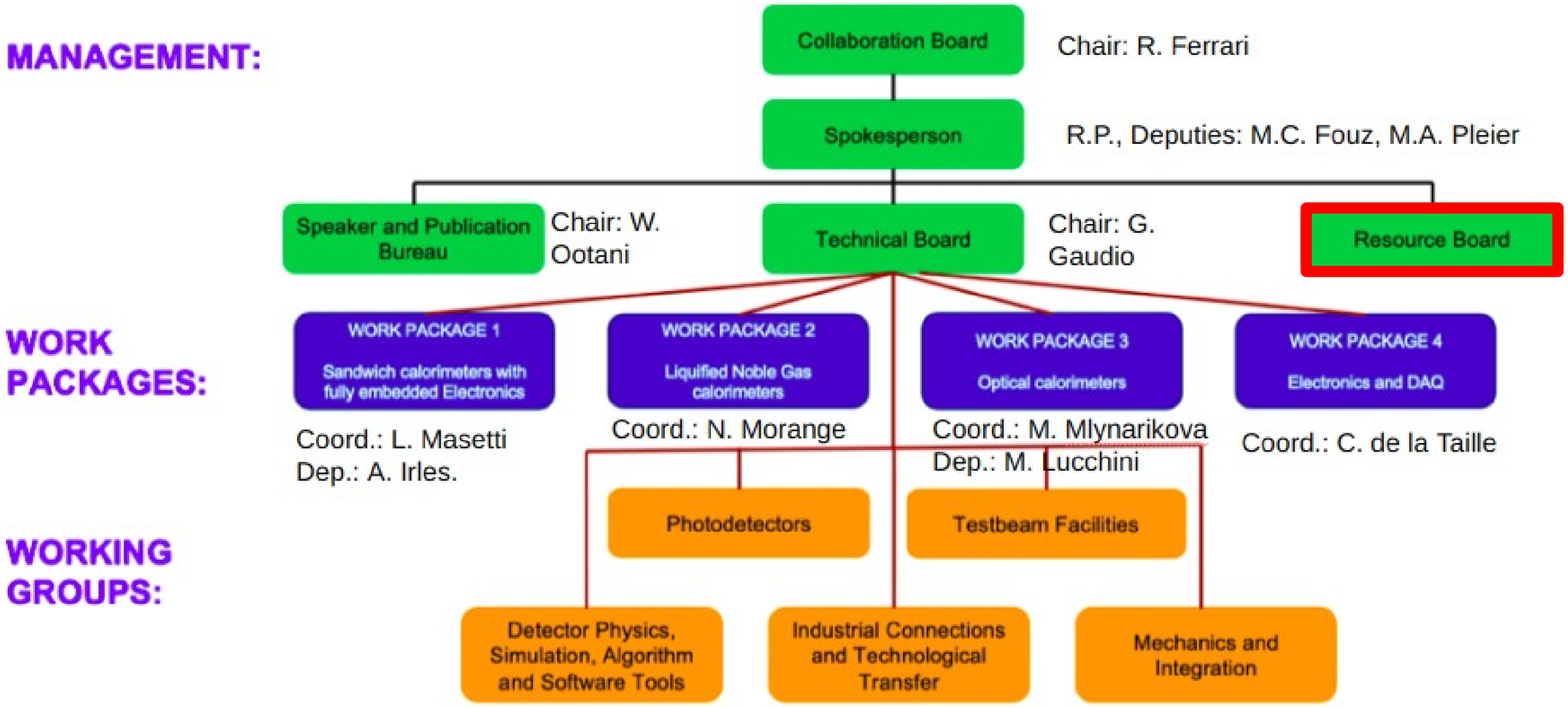
The DRD-on-Calorimetry Collaboration - Governance

History of the document:

- *Draft v0 23.10.2023*
- *Draft v1 17.5.2024*
- *Draft v2 4.6.2024*
- *Update v2 R.P. 27/7/24*
- *v3 for Collaboration Board review*

- The Governance Rules
  - ... are “by laws” in MOU language --> part of Annex
  - ... but in reality is our real constitution
  - ... make statements on goals and general policy of Collaboration
  - ... define the roles of the different positions and panels in the Collaboration
  - ... define membership to the collaboration
    - ... in coherence with MOU provisions
- Elaborated by Proposal Team
  - Work started about one year ago
  - Version circulating in CB since August ‘24
  - A number of comments
    - on specifying definitions on voting
    - on how talks and publications are managed
    - Wataru is working on a detailed publication Policy
  - Thanks for the feedback
- The rules will be modified, updated amended where needed
- Discussion and vote in tomorrow’s CB Meeting

Current structure – Resource Board



- We don’t have a resource board yet (Obligation by CERN)
- Should be place of Funding Agencies
- Have to carefully define its role and occupation (Discussion in CB tomorrow)

DRD Calo - Proposal Team

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

Representative from ECFA Detector R&D Roadmap Coordination Team: Felix Sefkow (DESY)

Deputy spokesperson: Mary Cruz Fouz (mcruz.fouz@ciemat.es)

WP 1: Sandwich calorimeters with fully embedded Electronics – Main and forward calorimeters
Conveners: Adrian Irles (IFIC, adrian.irles@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, imad.laktineh@in2p3.fr),
Lucia Masetti (masetti@physik.uni-mainz.de)

WP 2: Liquified Noble Gas Calorimeters
Conveners: Martin Aleksa (CERN, martin.aleksa@cern.ch), Nicolas
Morange (IJCLab, nicolas.morange@ijclab.in2p3.fr), Marc-Andre Pleier (mpleier@bnl.gov)

WP 3: Optical calorimeters: Scintillating based sampling and homogenous calorimeters
Conveners: Etiennette Auffray (CERN, etiennette.auffray@cern.ch),
Macro 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), Michaela Mlynarikova (michaela.mlynarikove@cern.ch)

WP 4: Electronics and DAQ
Christophe de la Taille (OMEGA, taille@in2p3.fr)

Transversal Activitiies

DRD Calo - Proposal Team

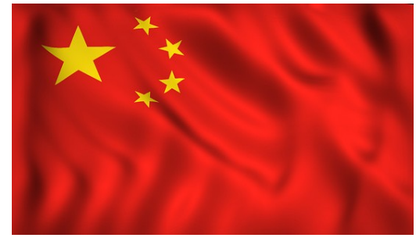
- With the management in place and the vote of the Governance Rules the mandate of the Proposal Teams will end
  - All of them will remain active to the benefit of the collaboration and are our wise people
- It played a pivotal role in setting up the Collaboration
  - We had 41 Meetings since February 2023
- It was my personal pleasure to work with so many distiguished colleagues to put the Collaboration on the rails
  - The endeavour actually started with the Roadmap Document

- Thank you very much

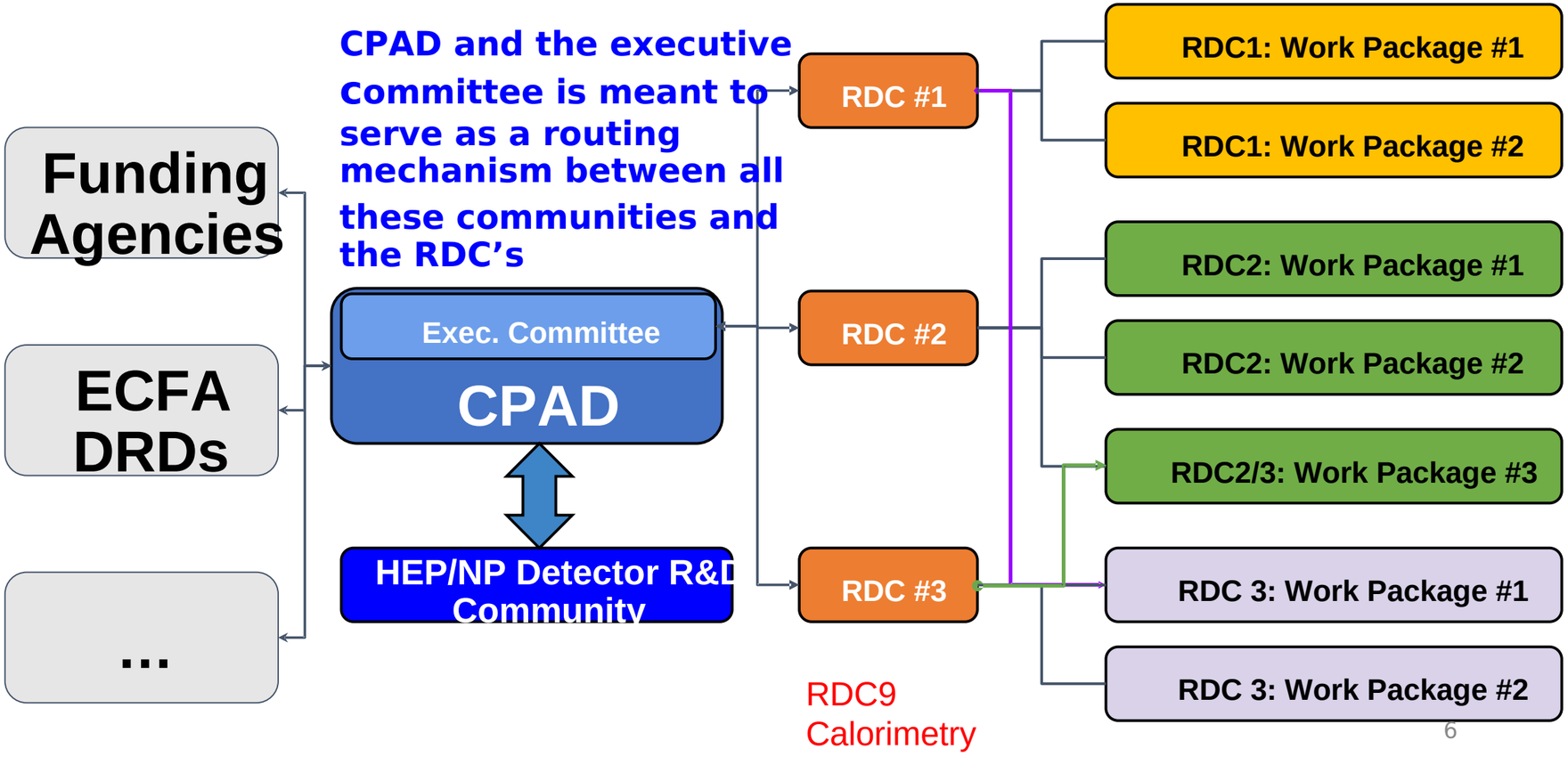
The bigger picture

DRD Calo

- DRD implements and/or connects to strategies in Europe, US and Asian Countries
- Interlink with US programme see next pages



The bigger picture – US RDCs and DRDs



N. Akchurin, CALOR 2024

US Perspectives on calorimetry R&D

- Overall goals
- Overview of ongoing detector-specific efforts:
  - Energy frontier - connections with CERN DRDs
  - Neutrino frontier
  - Rare processes and precision measurements frontier (quark flavor, precision experiments)

illustrative

- Generic interdisciplinary R&D efforts being developed: intersections of research fields and technologies

N. Akchurin, CALOR 2024

The bigger picture – Next Update of European Strategy

European Strategy Group (ESG) remit

Approved by Council in June

The remit of the European Strategy Group (ESG), established in June 2024, is to develop an update of the European Strategy for Particle Physics and submit it for approval by the Council. The aim of the Strategy update should be to develop a visionary and concrete plan that greatly advances human knowledge in fundamental physics through the realisation of the next flagship project at CERN. This plan should attract and value international collaboration and should allow Europe to continue to play a leading role in the field.

The ESG should take into consideration:

- the input of the particle physics community;
- the status of implementation of the 2020 Strategy update;
- the accomplishments over recent years, including the results from the LHC and other experiments and facilities worldwide, the progress in the construction of the High-Luminosity LHC, the outcome of the Future Circular Collider Feasibility Study, and recent technological developments in accelerator, detector and computing; the international landscape of the field.

The Strategy update should include the preferred option for the next collider at CERN and prioritised alternative options to be pursued if the chosen preferred plan turns out not to be feasible or competitive. The Strategy update should also indicate areas of priority for exploration complementary to colliders and for other experiments to be considered at CERN and at other laboratories in Europe, as well as for participation in projects outside Europe.

The ESG should review and update the Strategy and add other items identified as relevant to the field, including accelerator, detector and computing R&D, the theory frontier, actions to minimise the environmental impact and to improve the sustainability of accelerator-based particle physics, the strategy and initiatives to attract, train and retain the young generations, public engagement and outreach.

The ESG should submit the proposed Strategy update to the Council by the end of January 2026.

29

Strategy Chair: Karl Jakobs, former ECFA Chair, lead on Roadmap and DRD Creation

The bigger picture – Next Update of European Strategy

Community Involvement

(ii) Open Symposium 23 – 27 June 2025

In addition to plenary (and parallel) presentations, this Symposium should be organised such that there is room for discussions

(iii) Based on the collected input (March 2025) and Briefing Book (Sept. 2025) further input from the national communities is welcome

A proposal on how to collect and structure this input is presented by ECFA

Summary on Community Input

31 March 2025
Deadline for the submission of input from the community

Further input from national communities

23 – 27 June 2025
Open Symposium

End of September 2025
Submission of the "Briefing Book"

Further input from national communities, deadline 14 Nov 2025

01 – 05 December 2025
Strategy Drafting Session

- Central input for all DRDs or individual DRD input?
  - ... of course we are just implementing the last Strategy Update

DRD-on-Calorimetry – Communication

- In general we will use CERN e-groups as main communication channel

- Tree structure for general DRD Calo e-group
  - This means that **each institute** creates and maintains its own e-group
  - drdcalo-cern, drdcalo-pavia, drdcalo-ijclab, drdcalo-desy, ...
  - Only these e-groups will be included into the general e-group drdcalo-general@cern.ch
    - drdcalo-general exists since 22/2/24
    - Remark: It will take some time until all institutes have created their e-group
      - Until this happens the corresponding group leader will be explicitly part of drdcalo-general@cern.ch and will be responsible for propagating relevant information to his/her group
      - As soon as the e-group is created the group leader will be removed from the general e-group
      - As of today 43 institute e-groups exist, further reminders will be sent regularly to the Collaboration Board

- We need a web page ...

- We need a logo (and another name?)

- Indico page: https://indico.cern.ch/event/1449522/
  - 156 registered participants (133 in April), 50 on-site partially from far away

- Thanks very much to Patricia and Caroline for the support!!!!

- Sessions and Rooms
  - October 30th: CERN Council Chamber for plenaries
  - October 31st : CERN Council Chamber, Filtration plan (main), Filtration Plan (annex)
    - Parallels on WP 1-3 in morning
    - Plenary session in afternoon: Council Chamber
  - November 1st: CERN Council Chamber for plenaries
  - Room B as office space that might be also used for ad-hoc meetings

- Social events
  - Dinner on Thursday 31st of October at CERN, area outside of Glassbox in R1
  - Coffee breaks
    - Pas Perdus during plenaries
    - Parallel WP1: Pas perdus, WP2&WP3: Filtration plant (check agenda)

Conclusions

- DRD-on-Calorimetry will pursue strategic R&D for calorimeters for future colliders
  - Partially new efforts, partially capitalising on existing activities

- Collaboration structure is being put in place
  - Chairs of Boards in place
  - Work has started (e.g. 1st Technical Board Meeting, Draft on Publication Policy, ...)
  - Setting up of Collaboration structure will be important part of DRDC Review on Nov. 13th and 14th

- Now finalising the constitution
  - Vote on Governance Rules
  - Discussion on MOU and Annexes prior to signing
  - Next months will also address further important items
  - ECR Forum, inclusion and diversity policy

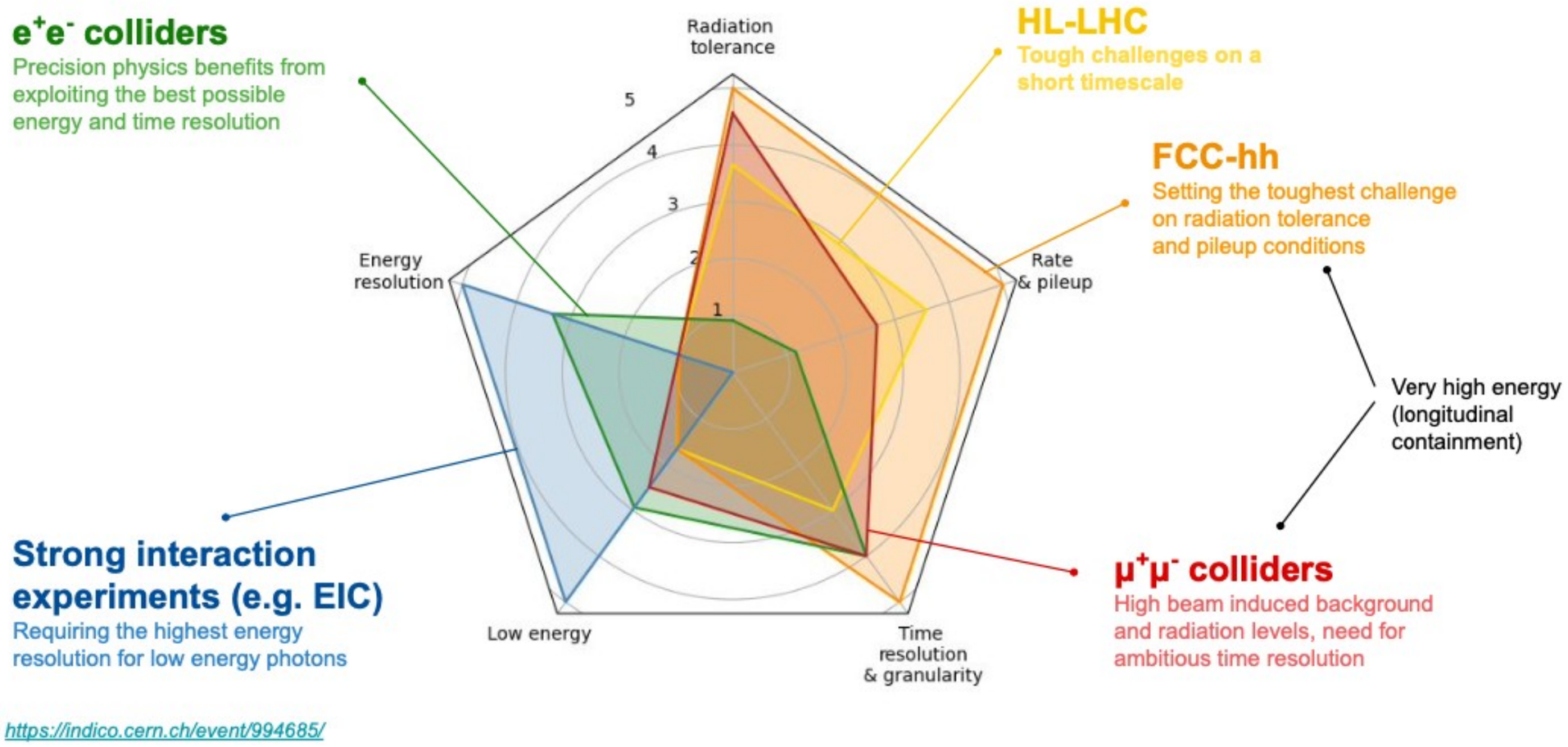
- The main goal of the next months is that all of you will quickly feel the added value of being member of the DRD

Welcome to the meeting
(and be there for the Group Photo at 15.30h)

Backup

Requirements for calorimetry at future colliders

DRD Calo

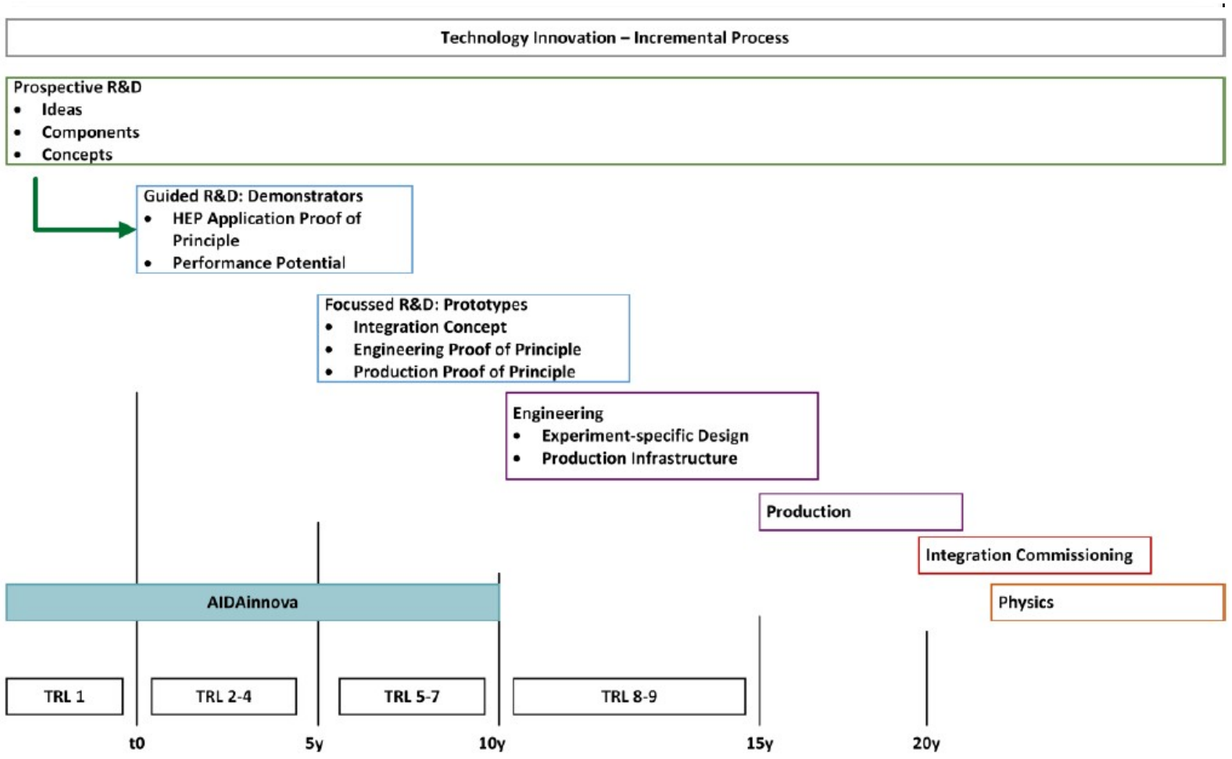


Inspired from https://indico.cern.ch/event/994685/

Categories of R&D

1. Strategic R&D via DRD Collaborations **vision**
   (long-term strategic R&D lines)
   (address the high-priority items defined in the Roadmap via the DRDTs)
2. Experiment-specific R&D **focus**
   (with very well defined detector specifications)
   (funded outside of DRD programme, via experiments, usually not yet covered within the projected budgets for the final deliverables)
3. "Blue-sky" R&D **agility**
   (competitive, short-term responsive grants, nationally organised)

Transitions Blue-sky → Strategic → Specific expected
Cross-fertilisation desired



F. Sefkow, CALICE Meeting and ECFA Higgs/top/EW Factory Meeting

The roadmap document(s)

- 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)
  - 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- Identified Key Technologies and R&D Tasks

DRD Calo

- Key technologies and requirements are identified in ECFA Roadmap
  - Si based Calorimeters
  - Noble Liquid Calorimeters
  - Calorimeters based on gas detectors
  - Scintillating tiles and strips
  - Crystal based high-resolution Ecals
  - Fibre based dual readout

- R&D should in particular enable
  - Precision timing
  - Radiation hardness

- R&D Tasks are grouped into
  - Must happen
  - Important
  - Desirable
  - Already met