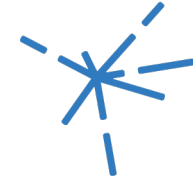




AUSTRIAN
ACADEMY OF
SCIENCES



MARIETTA BLAU
INSTITUTE FOR
PARTICLE PHYSICS

ECFA and DRD Collaborations

Thomas Bergauer, DRDC chair

Austrian Academy of Sciences,
Marietta-Blau-Institute for Particle Physics
(MBI; former HEPHY)

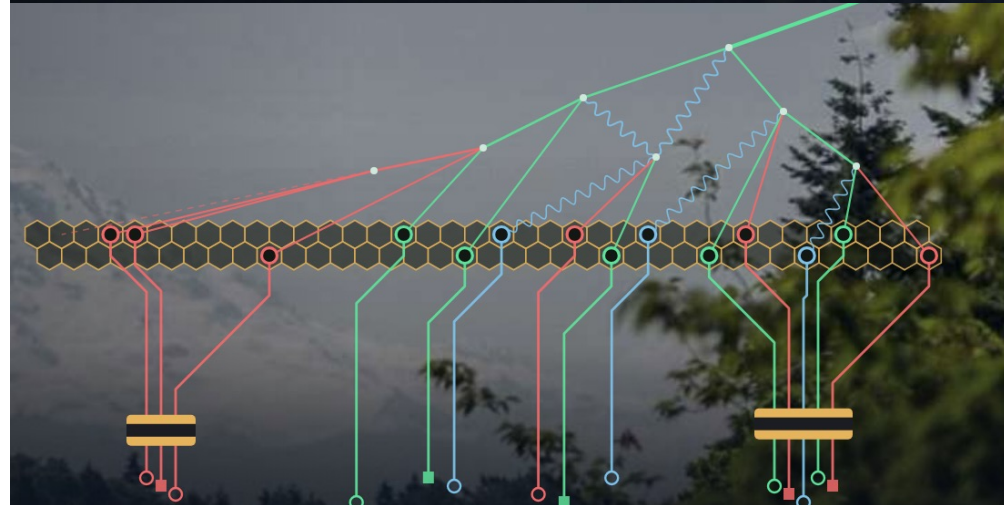
21 October 2026 – U Washington (Seattle)

COORDINATING PANEL ON ADVANCED DETECTORS · APS DPF

CPAD 2026

Instrumentation and detector R&D workshop

20–23 October 2026 University of Washington · Seattle, WA

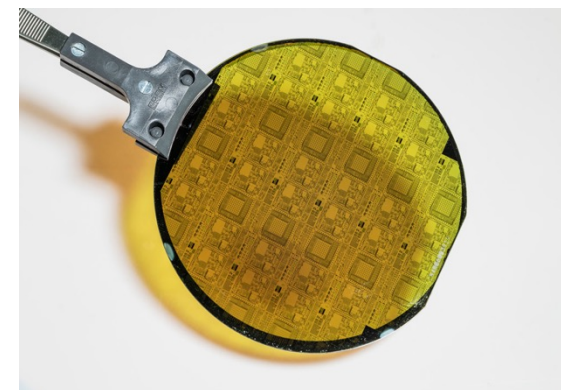
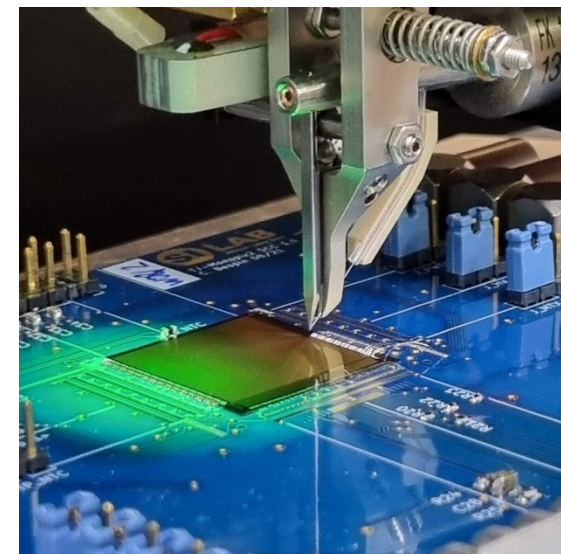


Detector R&D in Europe

1. European Strategy for Particle Physics 2026

- Process, Input proposals
- Outcome: Recommendations

2. Where to go with the DRD Collaborations



1. European Strategy for Particle Physics 2026:

Process

Input proposals

Outcome: Recommendations

Where to go with the DRD Collaborations

European Strategy for Particle Physics

- The European Strategy for Particle Physics (ESPP) is the cornerstone of Europe's strategy-setting process for the long-term future of the field.
- The European Strategy Group (ESG) develops recommendations, which are submitted to the CERN Council for an update of the Strategy
 - ESPP is **not** a project approval process
 - Projects are approved by CERN Council through a separate decision process, taking the Strategy recommendations into account

2006 (Original)

- discussions of LHC luminosity upgrade
- R&D in accelerator technologies
- Coordination with a potential ILC project

2013 (1st update)

- High Luminosity LHC
- Need for a post-LHC program

2020 (2nd update)

- FCC Feasibility Study
- Detector Roadmap

2026

- Recommendation for next flagship project
- Preferred project and possible alternatives

Strategy Update 2026

<http://europeanstrategy.cern> and <https://europeanstrategyupdate.web.cern.ch>

263 input proposals



Strategy Update 2026

<http://europeanstrategy.cern> and <https://europeanstrategy.cern>

263 input proposals



Physics Briefing Book released

CERN-ESU-2025-001
4 November 2025

Physics Briefing Book

Input for the 2026 update of the European Strategy for Particle Physics

Electroweak Physics: Jorge de Blas¹, Monica Dunford² (*Conveners*), Emanuele Bagnaschi³ (*Scientific Secretary*), Ayres Freitas⁴, Pier Paolo Giardino⁵, Christian Grefe⁶, Michele Selvaggi⁷, Angela Taliercio⁸, Falk Bartels² (*Contributors*)

Strong Interaction Physics: Andrea Dainese⁹, Cristinel Diaconu¹⁰ (*Conveners*), Chiara Signorile-Signorile¹¹ (*Scientific Secretary*), Néstor Armesto¹², Roberta Araldi¹³, Andy Buckley¹⁴, David d'Enterria⁷, Antoine Gérardin¹⁵, Valentina Mantovani Sarti¹⁶, Sven-Olaf Moch¹⁷, Marco Pappagallo¹⁸, Raimond Snellings^{19,83}, Urs Achim Wiedemann⁷ (*Contributors*)

Accelerator Science and Technology: Gianluigi Arduini⁷, Philip Burrows⁵¹ (*Conveners*), Jacqueline Keintzel⁷ (*Scientific Secretary*), Deepa Angal-Kalinin⁵⁵, Bernhard Auchmann^{76,7}, Massimo Ferrario³, Angeles Faus Golfe²¹, Roberto Losito⁷, Anke-Susanne Mueller⁵⁶, Tor Raubenheimer⁵⁷, Marlene Turner⁷, Pierre Vedrine⁴⁰, Hans Weise²⁴, Walter Wuensch⁷, Chenghui Yu⁵⁸ (*Contributors*)

Detector Instrumentation: Thomas Bergauer⁵⁹, Ulrich Husemann⁵⁶ (*Conveners*), Dorothea vom Bruch¹⁰ (*Scientific Secretary*), Thea Aarrestad³⁴, Daniela Bortoletto⁵⁴, Shikma Bressler⁶⁰, Marcel Demarteau⁶¹, Michael Doser⁷, Gabriella Gaudio⁶², Inés Gil-Botella⁶³, Andrea Giuliani²¹, Fabrizio Palla⁶⁴, Rok Pestotnik⁶⁵, Felix Sefkow²⁴, Frank Simon⁵⁶, Maksym Titov⁴⁰ (*Contributors*)

Computing: Tommaso Boccali⁶⁴, Borut Kersevan^{26,65} (*Conveners*), Daniel Murnane⁶⁶ (*Scientific Secretary*), Gonzalo Merino Arevalo⁶³, John Derek Chapman²⁷, Frank-Dieter Gaede²⁴, Stefano Giagu⁶⁷, Maria Gironi⁷, Heather M. Gray⁶⁶, Giovanni Iadarola⁷, Stephane Jezequel⁶⁸, Gregor Kasieczka¹⁵, David Lange⁶⁹, Sinéad M. Ryan⁷⁰, Nicole Skidmore⁷¹, Sofia Vallecorsa⁷ (*Contributors*)

Theoretical Overview: Eric Laenen^{19,83,85}

Reviewers: Anadi Canepa⁴⁹, Xinchou Lou⁵⁸, Rogerio Rosenfeld⁷², Yuji Yamazaki⁷³

Editors: Roger Forty⁷, Karl Jakobs⁷⁴, Hugh Montgomery⁷⁵, Mike Seidel^{28,76}, Paris Sphicas^{7,77}

<https://arxiv.org/abs/2511.03883>

<https://cds.cern.ch/record/2944678?ln=de>

Strategy Update 20

*ESG recommendations released on December 2025
based on the discussions at the Drafting Session*

CERN-ESU-2025-002
December 2025



The European Strategy for Particle Physics:
2026 Update

Recommendations
by the European Strategy Group

Documents - CDS:

<https://cds.cern.ch/collection/European%20Strategy%20Update?ln=en>



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15 December 2025

**ESG Strategy
Drafting
Session**

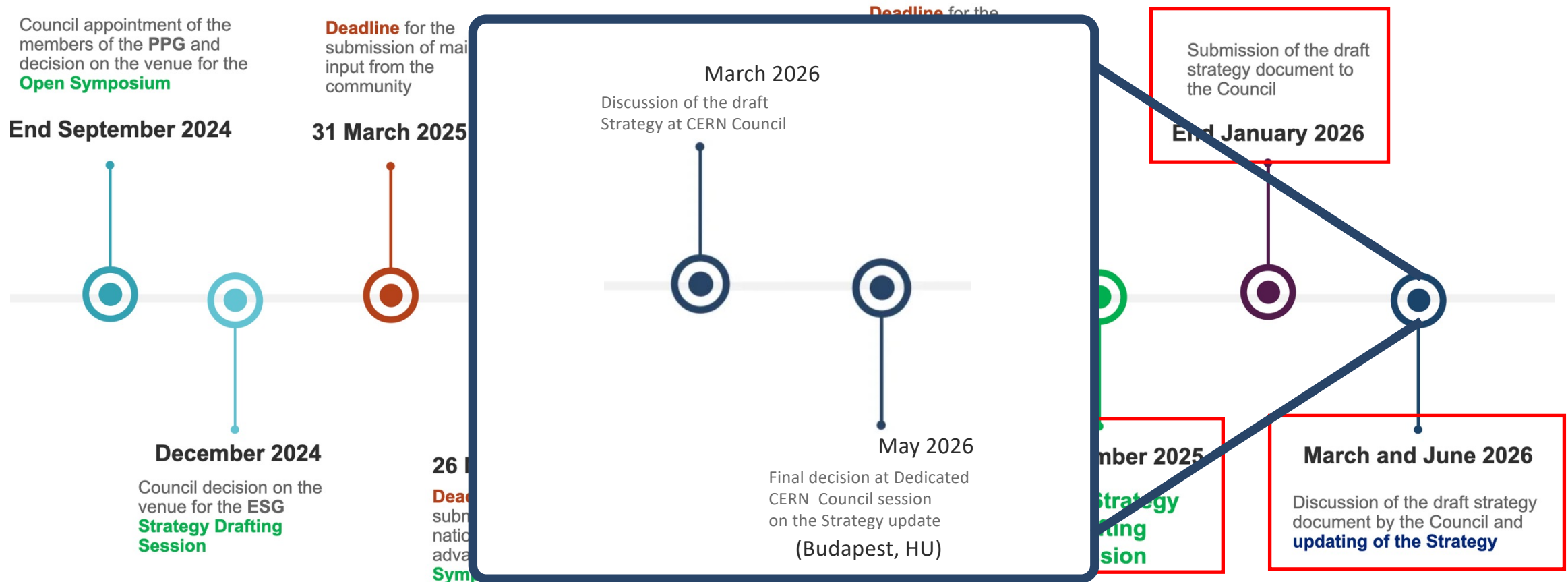
March and June 2026

Discussion of the draft strategy
document by the Council and
updating of the Strategy

Strategy Update 2026

<http://europeanstrategy.cern> and <https://europeanstrategyupdate.web.cern.ch>

263 input proposals



Strategy Update 2026

<http://europeanstrategy.cern> and <https://europeanstrategyupdate.web.cern.ch>

Deliberation and 8 WG documents released on April 1st



Report by ESG Working Group 1: National Input to the ESPP

CERN-ESU-2026-004
15 February 2026

Călin Alexa¹, Anadi Canepa², Budimir Kliček³, Panos Kokkas⁴, Eric Laenen⁵, Mark Lancaster⁶, Sandra Malvezzi⁷, Leandro de Paula⁸, Christelle Roy⁹, and Jochen Schieck¹⁰

Shared with community
on Oct 31, 2025

CERN-ESU-2026-005
15 February 2026

Report by ESG Working Group 2a: Assessment of Large-Scale Accelerator Projects at CERN

G. Arduini^{1,a} (convener), F. Bordry¹ (co-opted accelerator expert), R. Brinkmann² (co-opted accelerator expert), P. Burrows^{3,b} (convener), K. Desch⁴, S. Farrington^{5,6}, F. Gianotti¹, K. Hanagaki⁷, N. Holtkamp^{8,9} (co-opted accelerator expert), J. Keintzel^{1,c} (scientific secretary), B. Kilminster¹⁰, T. Lesiak¹¹, L. Rivkin^{12,13} (co-opted accelerator expert), F. Sabatié¹⁴, M. Tuts¹⁵, A. Zoccoli¹⁶.

CERN-ESU-2026-006
26 March 2026

Report by ESG Working Group 2b: Project Comparison – Physics Potential

Jorge de Blas¹, Anadi Canepa², Cristinel Diaconu³, Monica Dunford⁴, Pilar Hernández⁵, Gino Isidori⁶, Ben Kilminster⁷, Xinchou Lou⁸, Fabio Maltoni⁹, Jocelyn Monroe¹⁰, Rogerio Rosenfeld¹¹, and Yuji Yamazaki¹²

...

Discussion of the draft
document to
Council

January 2026

March and June 2026

Discussion of the draft strategy
document by the Council and
updating of the Strategy

Documents - CDS: <https://cds.cern.ch/collection/European%20Strategy%20Update?ln=en>

ESG Recommendations (I)

I. The next CERN flagship collider project

- i. *The electron–positron Future Circular Collider (FCC-ee) is recommended as the preferred option for the next flagship collider at CERN.*
- ii. *A descoped FCC-ee is the preferred alternative option for the next flagship collider at CERN*

At this stage, without knowing the reasons for which the FCC-ee would not be feasible, other alternative options are not ranked.

Machine	Precision Physics	BSM physics	Physics vs CEPC	Technical readiness	Constr. cost (BCHF)	Time scale	Path to ≥ 10 TeV
FCC-ee	22	23			15.3	2046-2060	
Descoped FCC-ee	15	17			12.9	2046-2055	
LCF550	15	17			14.8	2045-2065	
CLIC1500	14	18			14.6	2045-2066	
LCF250	10	16			9.4	2045-2053	
CLIC380	10	16			7.5	2045-2054	
LEP3	15	17			4.1	2047-2062	
LHeC	8	7			2.1	2044-2051	

While the FCC-ee has been demonstrated to be technically feasible, its implementation remains subject to uncertainties related to:

- (i) **Financial viability**
and
- (ii) The potential **emergence of unforeseen challenges**, notably those associated with **tunnel construction** (acceptance by the population/political)

ESG Recommendations (II)

- i. *The **full exploitation of the physics potential of the LHC and the HL-LHC and the completion of the high-luminosity upgrade remain the highest priorities** of European particle physics.
Every effort must be made to complete the HL-LHC upgrade within the current schedule.*
- ii. *The unique **ecosystem** of particle physics **research centres and universities in Europe** should be further strengthened in order to address the objectives set out in this Strategy.*
- iii. *The implementation of the Strategy should be pursued in **strong collaboration with global partners and neighbouring fields**.*
- iv. *The relationship between the particle physics community and the European Commission should be further strengthened, exploring funding opportunities for the realisation of infrastructure projects and R&D programmes in cooperation with other fields of science and industry.*

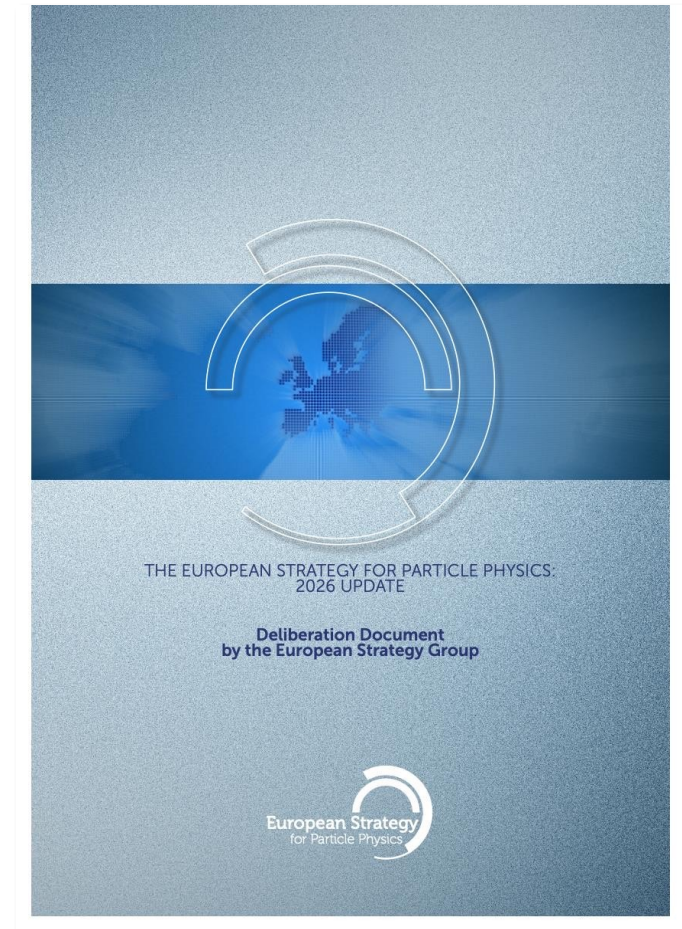
*To ensure that Europe remains at the forefront of technologies for particle physics, **R&D in collaboration with international partners and industry** must continue to be supported with high priority, thereby enhancing sustainability and societal impact.*

Detector Technology:

- i. For the **DRD collaborations** to address the requirements of future flagship projects, they **must receive adequate funding**. New R&D topics and initiatives should be integrated in the DRD scheme. The General Strategic Recommendations in the roadmap must be fully addressed by dedicated initiatives coordinated across the DRD collaborations.*
- ii. A coherent, strategic approach and sufficient resources to support **close cooperation with industry** are required to address the rising costs and growing complexity in engineering, particularly in microelectronics.*
- iii. To enhance efficiency and align developments with global technology trends in other fields, standardised, off-the-shelf solutions should be prioritised over custom designs, where applicable*

Further ESPPU recommendations on detectors

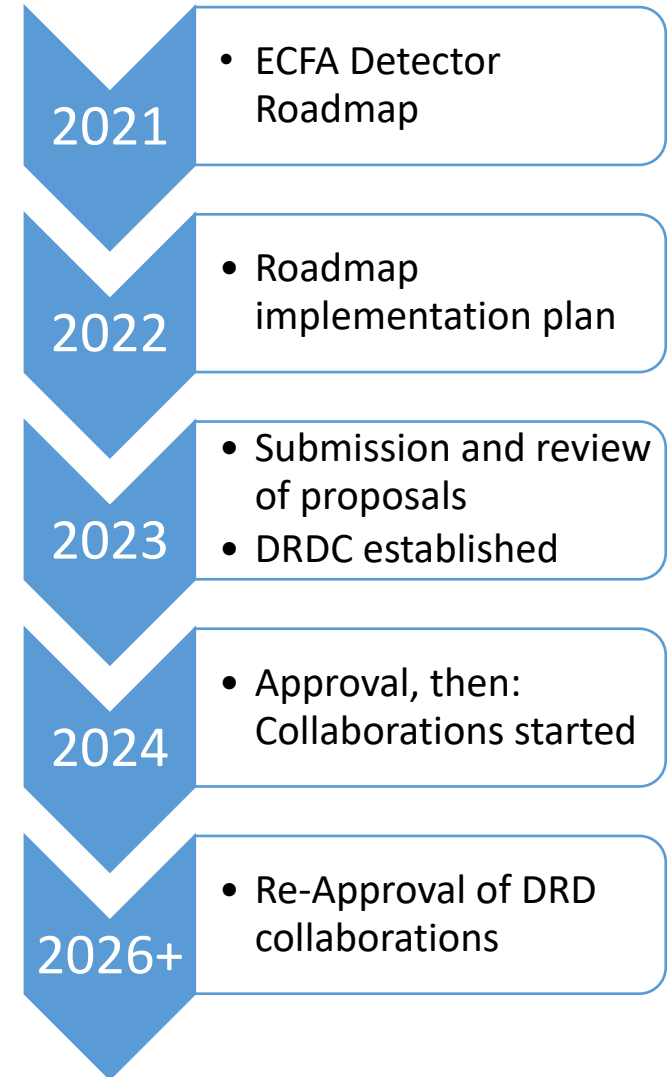
- **The major targets of the detector R&D** should be the preferred option for the next flagship collider at CERN, FCC-ee, as well as the **future non-collider initiatives** (neutrinos, dark matter searches)
- The **ECFA Detector Panel** & recently established **DRD Managers Forum** should **set up an appropriate framework to support and foster cross-DRD coordination**
- Further **initiatives addressing the ten General Strategic Recommendations** (GSRs) topics also need to be organized jointly across all DRD collaborations
- **Bidirectional Knowledge & Technology Transfer** (KTT) must become integral to R&D process
- **Dissemination & Communication** should target a broad range of stakeholders (decision makers)



2. Where to go from the present DRD collaborations?

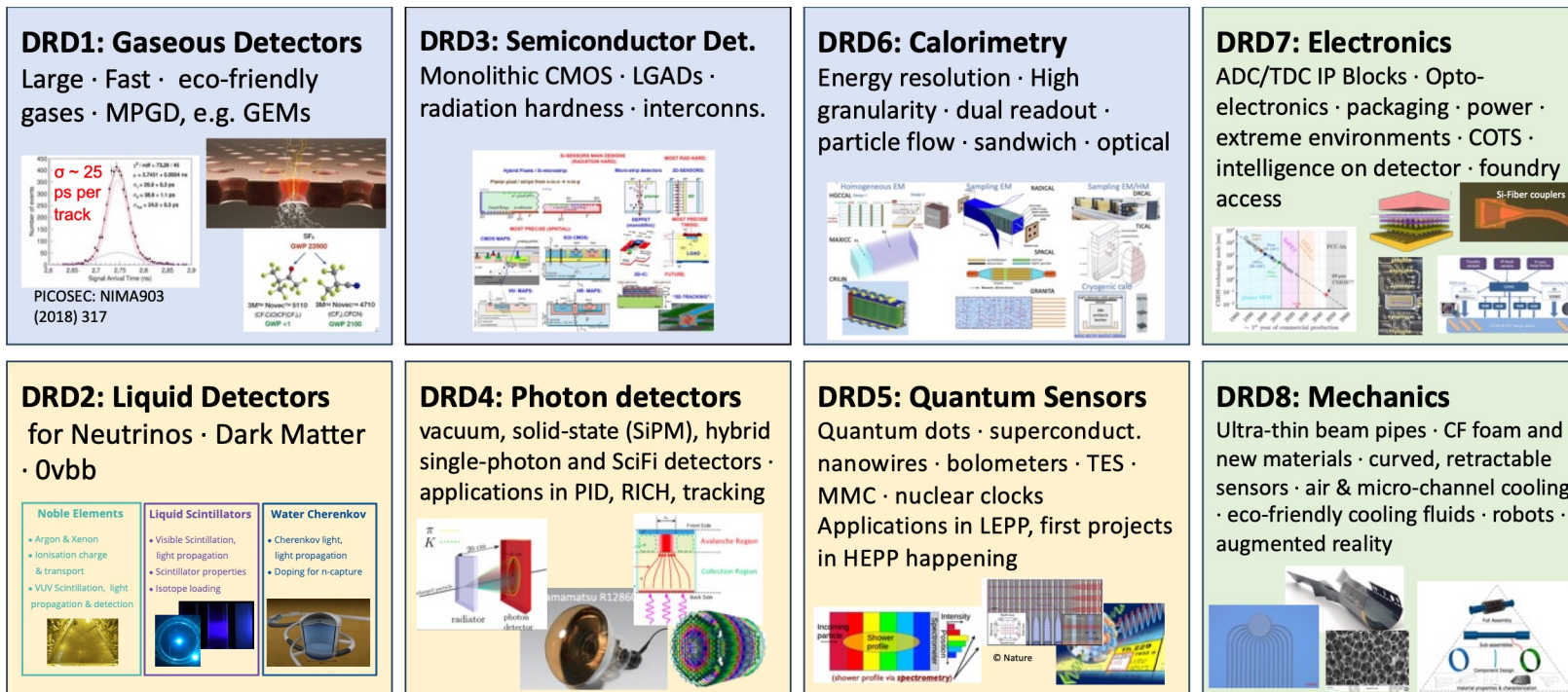
Instrumentation since ESPPU 2020

- *ECFA Detector Roadmap* as result of last ESPP Update 2020
 - Most of the chapter's convenors ("Task Forces") from ECFA Roadmap process became part of *Proposal Writing Teams* for new DRD collaborations
- *Roadmap implementation plan* defined that CERN will host the DRD collaborations
 - Approved by CERN SPC and Council in fall 2022 ([CERN/SPC/1190: CERN/3679](https://cds.cern.ch/record/1190367))
 - DRDC created as new committee at the same level as LHCC, SPSC and others; ECFA Detector panel kept an "advising role"
- **Approval of DRD collaborations** for an initial period of three years:
 - DRD 1,2 4 & 6 in December 2023 → **renewal in Dec. 2026**
 - DRD 3, 5 and 7 in June 2024, DRD 8 in December 2024 → 2027



DRD Collaborations today

- A coherent framework is now in place
 - 8 DRDs: organized in WGs/WPs
 - Approved and running with MoU process ongoing

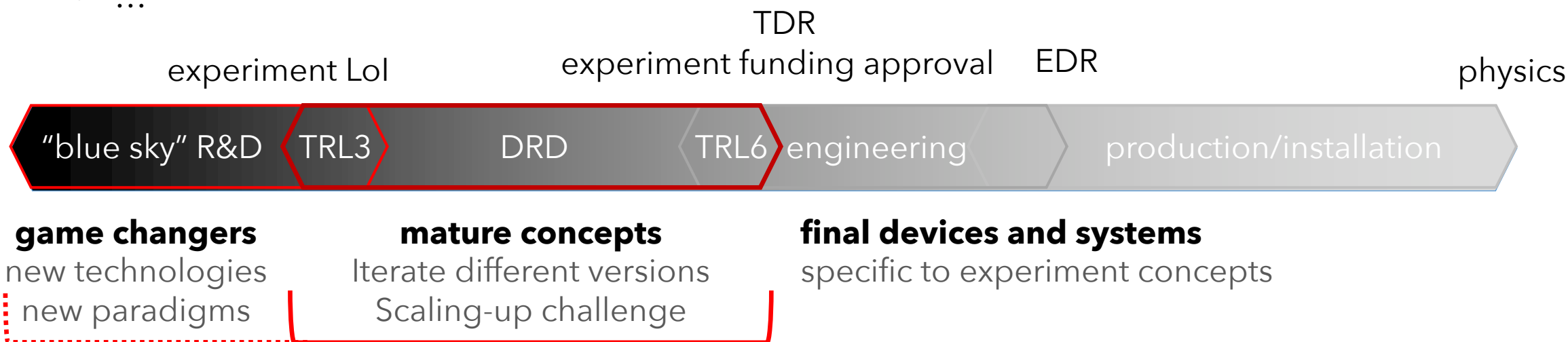


DRDs should covers low TRLs

- “Blue Sky” R&D develops new technologies (TRL 1-3)
- **Strategic R&D** (TRL 3-6) bridges the gap between “blue sky” and the deployment and use in a HEP experiment (TRL 8-9)
covers the **development and maturing of technologies**, e.g.
 - Iterating through different options
 - Improving radiation hardness
 - Scaling up: detector area, number of channels, layers,..
 - ...

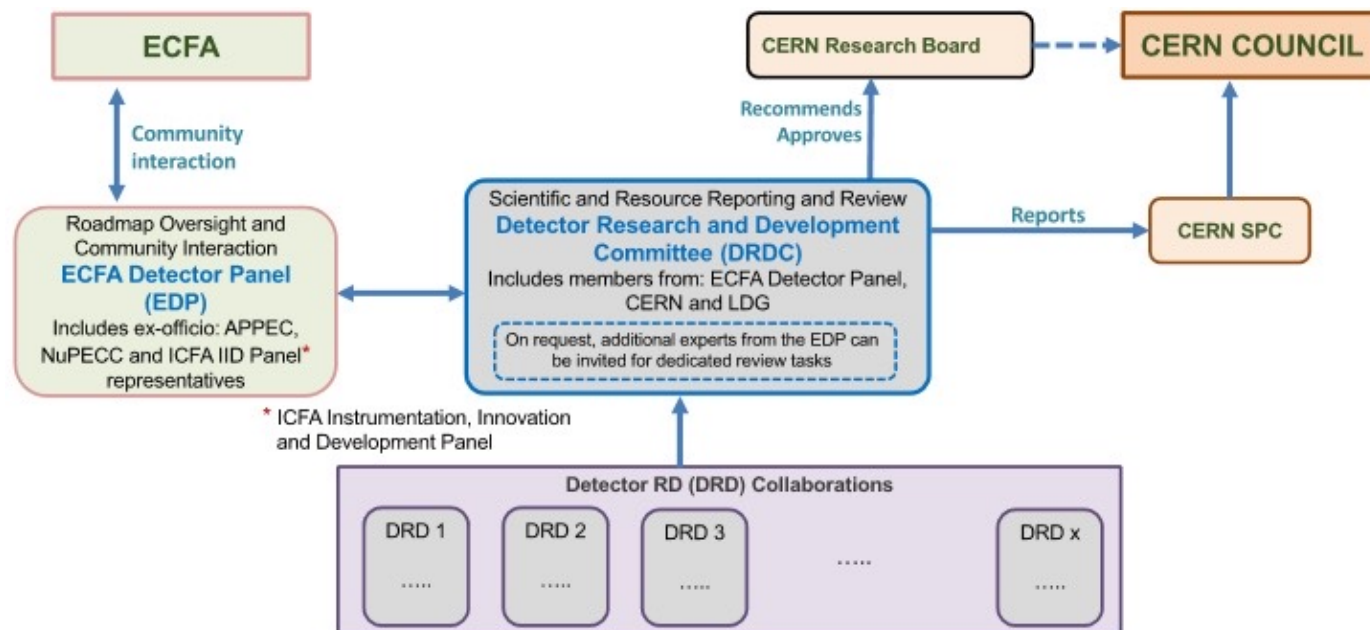
Technology Readiness Levels (TRL):

Experiments	System Test, Deployment, and Operations	9
	System Development	8
		7
Strategic	Technology Demonstration	6
	Technology Development	5
Blue Sky		4
	Research to Prove Feasibility	3
	Fundamental Science/ Basic Research	2
		1



Roles in Detector R&D

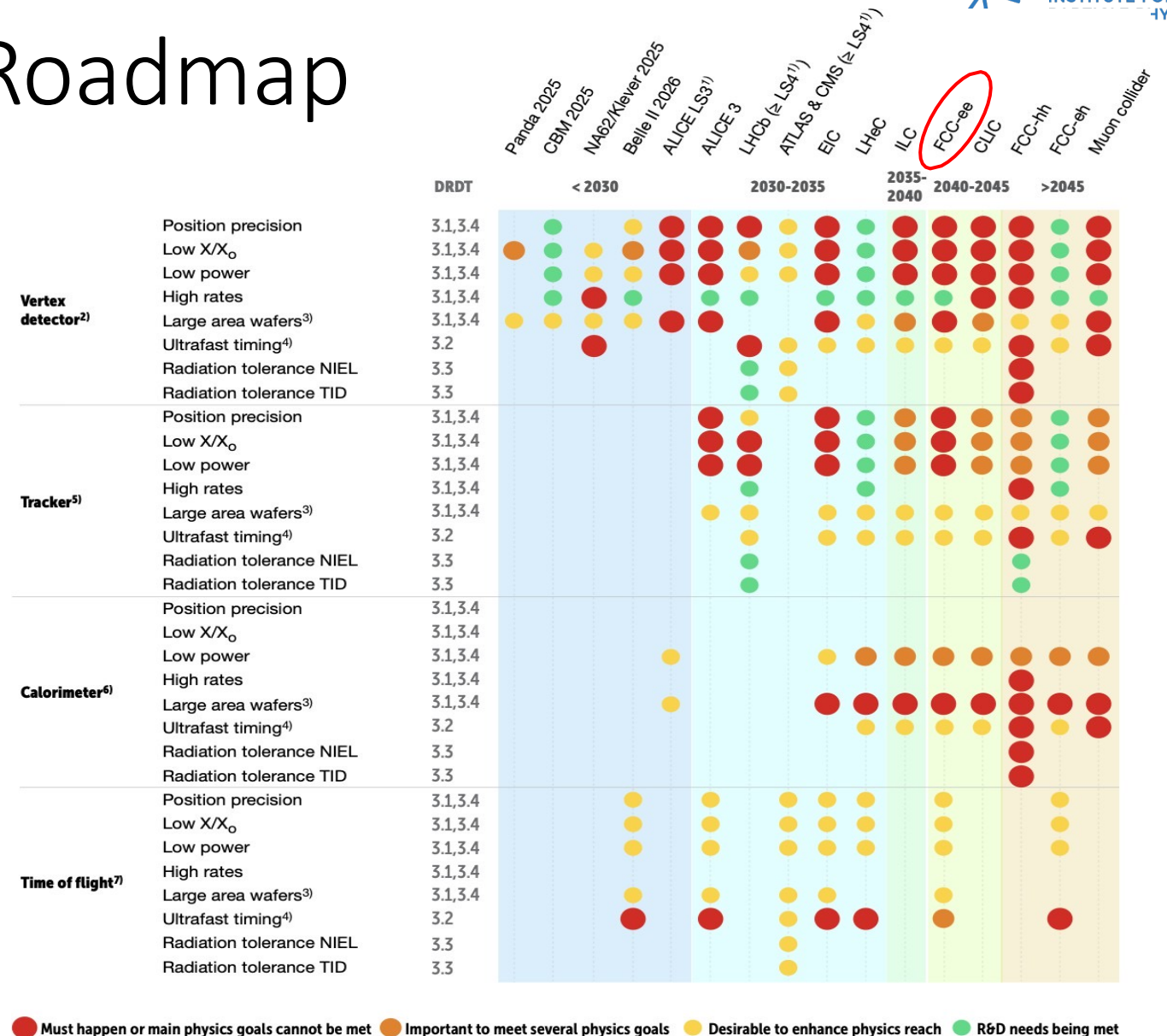
- **DRDs**: implementation of activities
- **DRDC**: review committee
- **ECFA Detector Panel (EDP)**: advisory role & support cross-coordination
 - **DRD Manager Forum**



- **No overarching management structure above DRD collaborations exists**
- Therefore, funding agencies and community support are essential to enable full implementation of strategy recommendations (cross-DRD coordination on common topics, find synergies,..)

ECFA Detector Roadmap

- From 2022, but still valid
- After the Strategy Update, the focus of R&D targeted at collider detectors should move to FCC-ee
- Detector Roadmap Update only after full FCC-ee approval by CERN Council after funding has been secured (~2028)



Strategic Alignment ESPP <-> DRDs

Collaboration	Re-approval	Initial approval
DRD 1,2 4 & 6	Nov 2026	Dec 2023 [RB 247]
DRD 3*), 5 and 7	March 2027	June 2024 [RB 249]
DRD 8	Nov 2027	Dec 2024 [RB 251]

Re-approval of DRD collaborations is due in the months ahead, following the initial three-year approval period. DRDC requests for re-approval:

- A **summary of the main achievements** from the first approval period
- **Define milestones and deliverables** for the next 3-year period 2027-2029 in a 10+10-page document
 - **Focus on developments for FCC-ee experiments to maximize funding opportunities**
- DRD 1, 3, 4 and 6 presented first ideas of such a plan at the plenary ECFA Meeting in Amsterdam on 9/10th July [[Indico](#)], the other DRDs follow in November [[Indico](#)]

Establish long-term funding

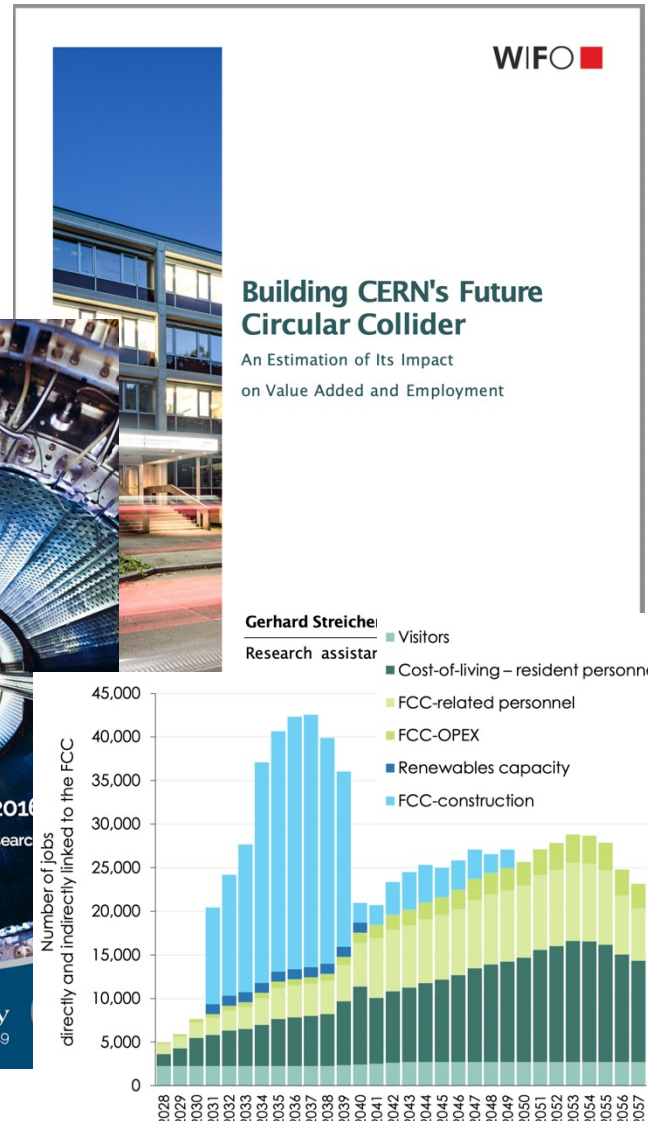
GSR4

DRD collaborations do not bring funding ab initio

- Only resource-loaded projects described in MoUs will be backed up by funding agencies commitments → 2nd phase of setting up DRD collaborations

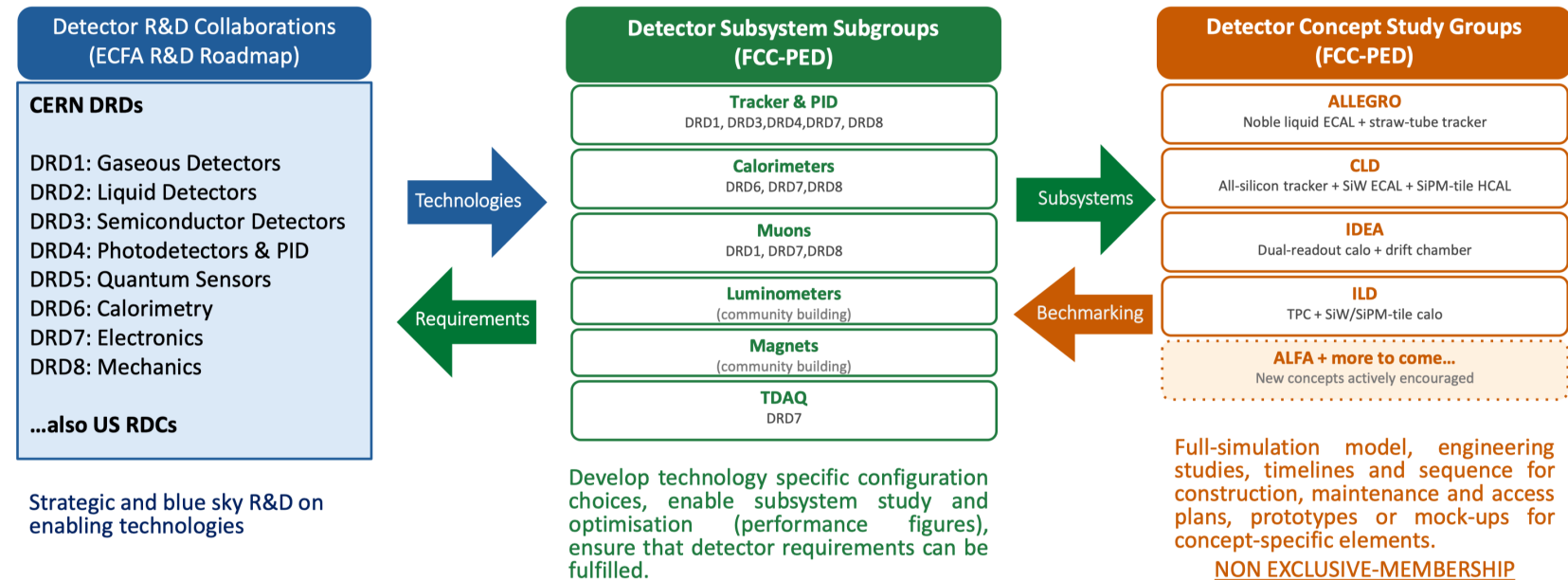
Funding agencies need to be convinced that detector R&D is a good investment

- Is targeted to FCC-ee (if this is the next big flagship)
- But also that
 - Benefit for related fields of **astroparticle** and **nuclear** physics
 - **Society at large**: job creation, education, training, applications and KT to other domains, e.g., medical physics (dosimetry, PET, imaging,...), automotive, environmental,...
- **No metric exists** to quantify socio-economic impact of instrumentation, but other studies exist
 - [Cebr studying impact of physics](#) (recently updated)
 - [WIFO FCC report](#): FCC will generate €50 billion in worldwide value added and create around 26,000 jobs annually



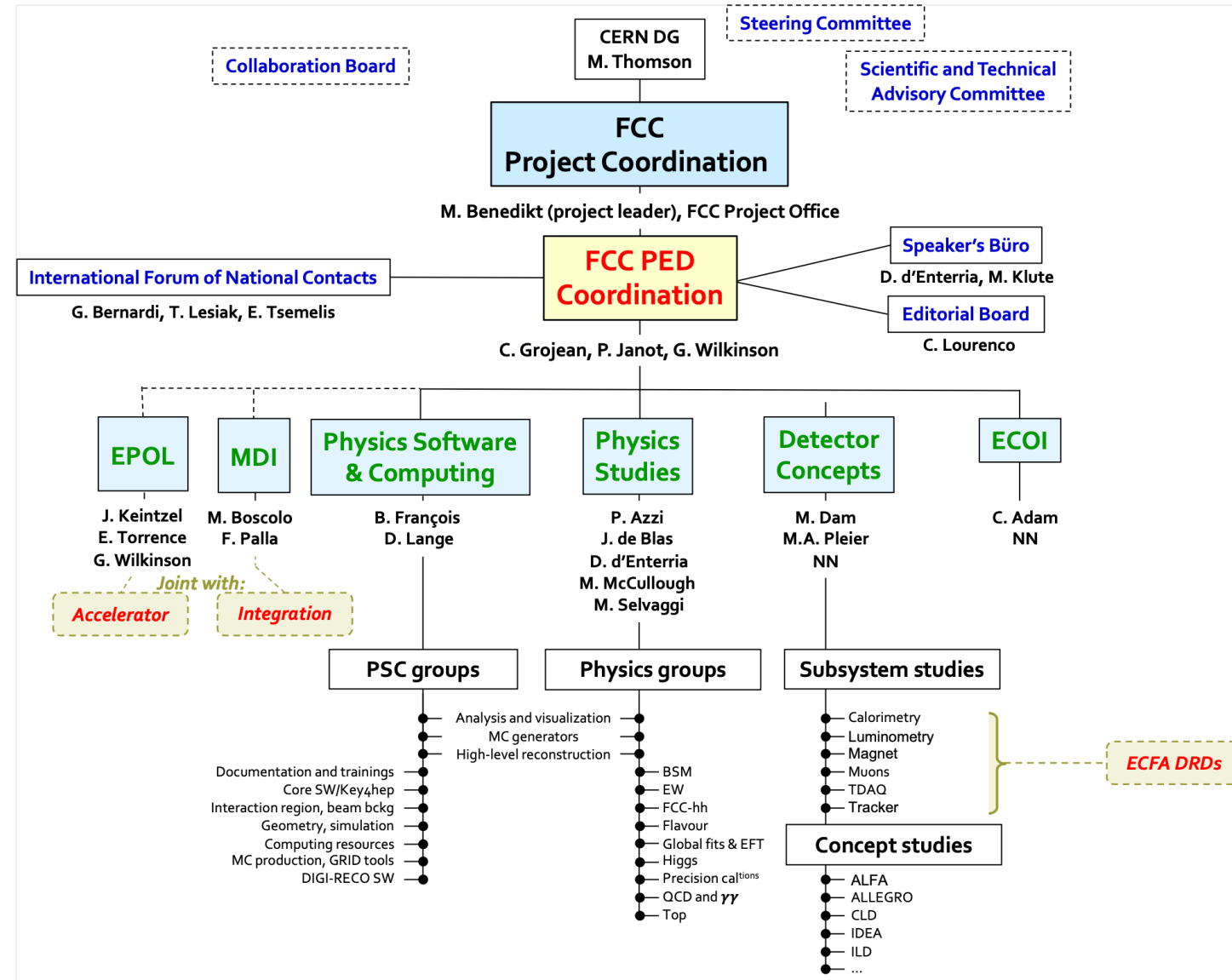
DRD–FCC interface

- FCC-ee, as the **next flagship collider**, is a particularly important player in the strategic guidance to R&D
 - 39 EoI for detector R&D towards FCC-ee were submitted as input to ESPP
- Important to enhance interaction between:
 - DRDs
 - FCC-ee Detector Concept & Subsystem WGs
- A structured connection and mutual engagement encouraged
- Implementation remains with DRDs and FCC structures



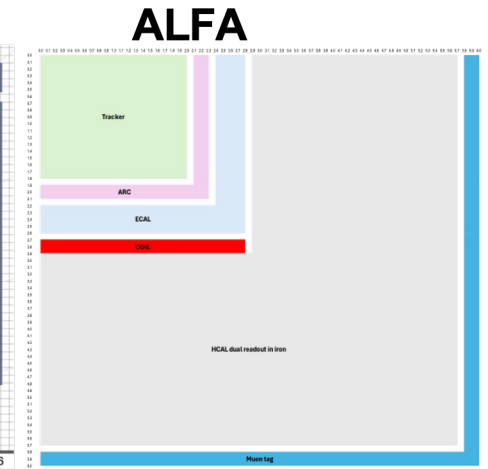
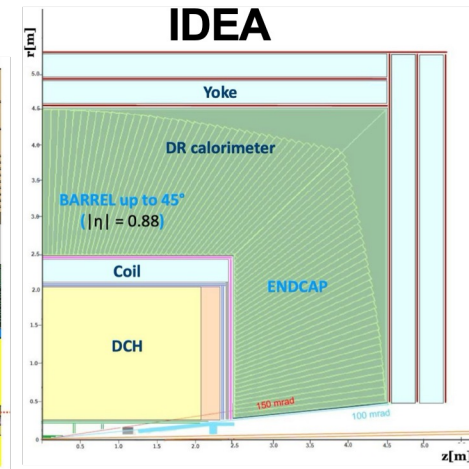
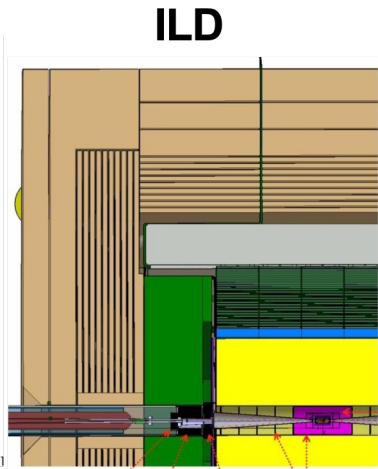
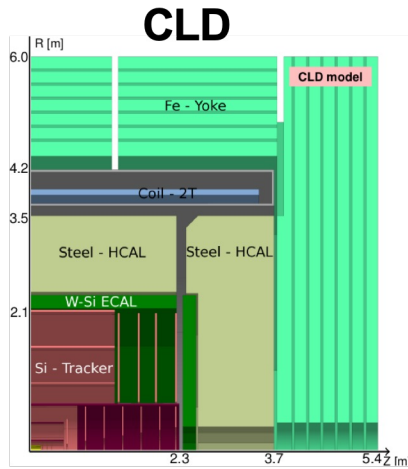
FCC Organization

- FCC project is now entering the *Reference Design Phase*
- This stage is focused on assembling the material required for a Council decision in 2028
- Physics, Experiments and Detector (PED)** pillar is evolving accordingly
- DRDs are seen as technology drivers for subsystems



Detectors Concepts for FCC-ee

Legend: Inner Tracker, Outer Tracker, Wrappers



- Evolved from CLIC detector
- Silicon vertex with 25μm pixels
- Geometry with ALICE ITS approximation → FCC-SEED
- Silicon tracker with 50μm strips
- Sensors plus ASICs or monolithic structure or MAPS
- ARC (Array of RICH Cells) Lightweight with 20cm radial depth
- Two radiators (gas + aerogel)

- Initial design for ILC
- Significant changes for FCC-ee
- Silicon Vertex
- Currently borrowed from CLD for simulations
- TPC as outer tracker
- Studying different layouts varying the inner Radii
- Silicon External Tracker for ToF + momentum resolution

- Conceived for FCC-ee
- Silicon vertex tracker
- Outer based on ATLASPix3 with 50x150μm² pixels
- Inner ARCADIA based 25x25 μm² pixels
- Outer tracker based on low mass Drift Chamber
- 112 layers
- 4m Long
- R = 35-200cm
- Silicon wrapper
- either with MAPS with ~10¹¹ channels!
- or CMOS-LGADS ~40ps

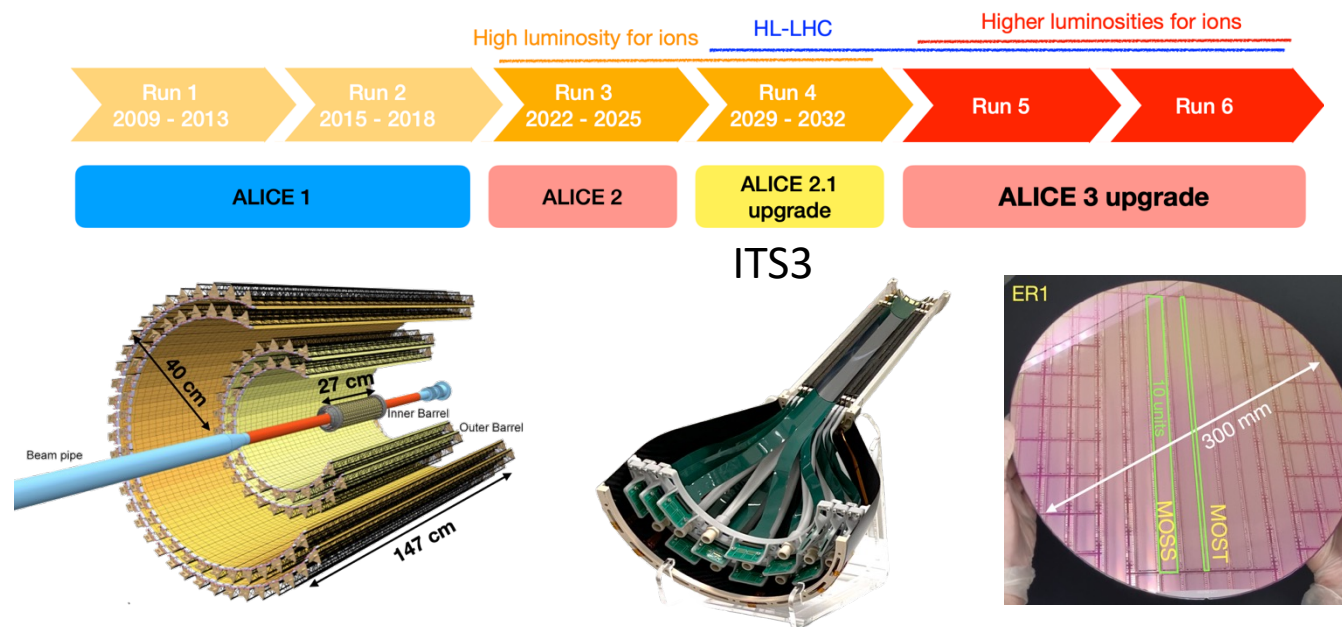
- Conceived for FCC-ee, started with a noble-liquid calorimeter
- Tracking system taken from IDEA
- Silicon Vertex with curved or straight sensors
- Outer tracker with
- Extended Drift Chamber
- Straw tubes
- Scintillating Fiber Tracker (SciFi)
- 5m Long
- R = 35-200cm
- Silicon wrapper
- Monolithic pixel or AC-LGADS

- Newly Conceived project for FCC-ee
- MAPS tracker following ALICE ITS3 developments
- Vertex curved MAPS 65 nm CMOS TPSCo 10x10 μm² pixels
- Outer tracker Reticule-size MAPS,
- 25x32 mm² to 50x128 mm² module
- ARC (Array of RICH Cells) Lightweight with 20cm radial depth
- Two radiators (gas + aerogel)

Vertex Detector Requirements of FCC- ee Exps., ALICE, ePIC, Belle II,..

Vertex Detectors for FCC-ee have **similar requirements to other experiments starting in the 2030ths** (ALICE3, ePIC, Belle-II)

- Resolution (special single point: $3 \mu\text{m}$, time: 5 ns)
- Hit rate/density (up to) 200 MHz/cm^2
- Power consumption $< 50 \text{ mW/cm}^2$
- Radiation hardness TID: 100 kGy , NIEL: $\sim 10^{13}/\text{cm}^2$
- Material budget: very low 0.3% of radiation length per layer



	ITS3	ALICE 3 VTX	ALICE 3 TRK	ePIC	FCC-ee
Single-point res. (μm)	5	2.5	10	5	3
Time res. (ns RMS)	2000	100	100	2000	20
In-pixel hit rate (Hz)	54	96	42		few 100
Fake-hit rate (/pixel/event)	10^{-7}	10^{-7}	10^{-7}		
Power cons. (mW/cm^2)	35	70	20	<40	50
Hit density (MHz/cm^2)	8.5	96	0.6		200
NIEL ($1 \text{ MeV } n_{\text{eq}}/\text{cm}^2$)	$4 \cdot 10^{12}$	$1 \cdot 10^{16}$	$2 \cdot 10^{14}$	few 10^{12}	10^{14} (/year)
TID (Mrad)	0.3	300	5	few 0.1	10 (/year)
Material budget (X_0/layer)	0.09%	0.1%	1%	0.05%	$\sim 0.3\%$
Pixel size (μm)	20	10	50	20	15-20

Suggested Initiatives

From Deliberation Document [[CDS](#)]

- **Coordination across the eight DRDs** on common overarching activities
 - Topics include: database of contacts with industry, conference announcements, instrumentation schools, outreach
 - EDP and the DRD Managers Forum should **establish a framework to support and foster cross-DRD coordination**
- The **ten General Strategic Recommendations** remain highly relevant and have not yet been sufficiently explored. Thus, **initiatives addressing the GSR** topics must be organized jointly across all DRD collaborations.
 - EDP is currently discussing possible activities

General Strategic Recommendations

1. GSR 1 - Supporting R&D facilities: test beams, large-scale prototyping, irradiation
2. GSR 2 - Engineering support for detector R&D
3. GSR 3 - Specific software for instrumentation
4. **GSR 4 - International coordination and organization of R&D activities**
5. GSR 5 - Distributed R&D activities with centralized facilities
6. **GSR 6 - Establish long-term strategic funding programs**
7. **GSR 7 - Support “Blue-sky” R&D**
8. GSR 8 - Attract, nurture, recognize, and sustain the careers of R&D experts
9. GSR 9 - Establish and maintain Industrial partnerships
10. GSR 10 - Support Open Science

Proposed cross-DRD coordination areas

- Following areas are under discussion for enhanced coordination
 - Overlaps between DRDs with shared challenges
 - Limited resources, need to avoid duplication
 - Facilitate exchange, improve coordination, increase visibility of the actions

Knowledge Transfer (KTT)

- support a bidirectional KTT approach across DRDs, as encouraged in the Strategy Update Document
- coordinate cross-cutting technologies, industrial engagement and societal needs

Dissemination & Communication

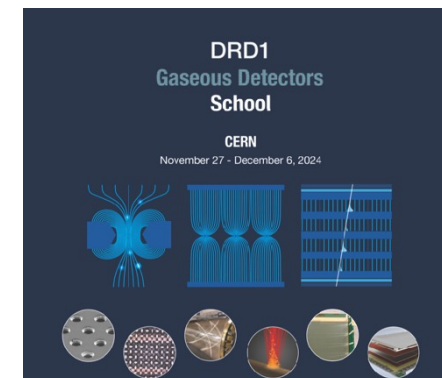
- Establish a coordinated approach to promotion and dissemination across DRDs, starting from activities of the liaisons already existing in the DRDs
- strengthen links with engineering faculties, industry, policy makers and neighbouring disciplines

Engineering Support

- consolidate information on engineering needs across DRDs focusing on concrete R&D projects, including FCC -ee system/det requirements
- provide input for discussions with laboratories and funding agencies.

Training, Education and Careers

- Sustainable **Career Models**: Addressing long-term career paths
 - Competitive salaries would enable mobility between academia and industry
 - **An alternative personnel pipeline is necessary as long as academia cannot compete with salaries in industry**
 - **Find partnerships and open career paths** from closely connected technological domains **within academia**, i.e. from electrical/electronics/mechanics engineering faculties
 - Start with engagement even earlier: **Outreach in high schools**
- Establishing a **European Curriculum in Instrumentation**
 - **Beginner level**: through university master's and graduate programs, supported by material compiled by HEP
 - **Intermediate level**: Erasmus Mundus Master in Instrumentation
 - **Advanced level**: (PhD and postdoc level): dedicated schools in instrumentation (e.g. EDIT) or DRD-specific schools
 - Establish a CERN-hosted instrumentation school similar to *CERN Accelerator School* and the *CERN School of Computing*. **First attempt: [2027 ECFA Winter Instrumentation School](#)**

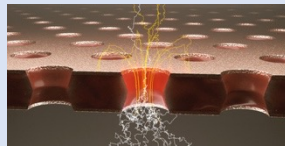
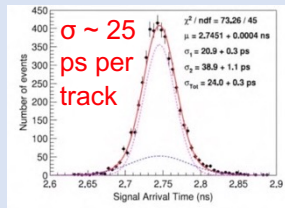


Summary

DRDs today

DRD1: Gaseous Detectors

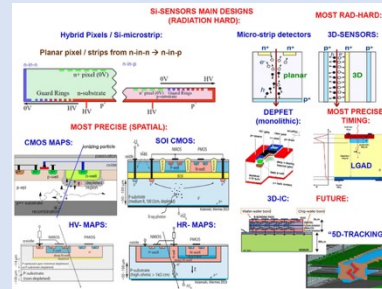
Large · Fast · eco-friendly
gases · MPGD, e.g. GEMs



PICOSEC: NIMA903
(2018) 317

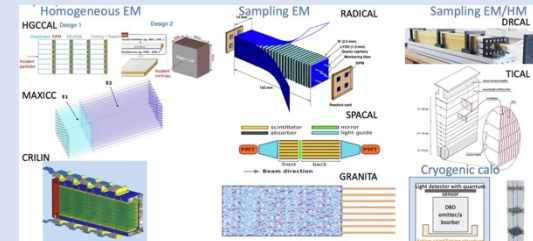
DRD3: Semiconductor Det.

Monolithic CMOS · LGADs ·
radiation hardness · interconns.



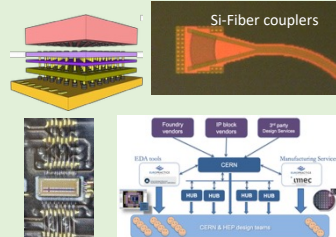
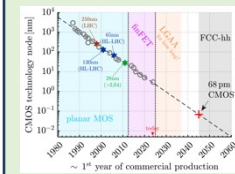
DRD6: Calorimetry

Energy resolution · High
granularity · dual readout ·
particle flow · sandwich · optical



DRD7: Electronics

ADC/TDC IP Blocks · Opto-
electronics · packaging · power ·
extreme environments · COTS ·
intelligence on detector · foundry
access

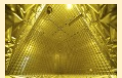


DRD2: Liquid Detectors

for Neutrinos · Dark Matter
· Ovbb

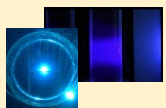
Noble Elements

- Argon & Xenon
- Ionisation charge & transport
- VUV Scintillation, light propagation & detection



Liquid Scintillators

- Visible Scintillation, light propagation
- Scintillator properties
- Isotope loading



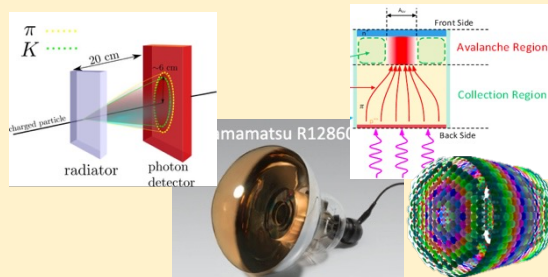
Water Cherenkov

- Cherenkov light, light propagation
- Doping for n-capture



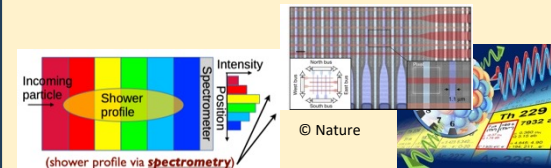
DRD4: Photon detectors

vacuum, solid-state (SiPM), hybrid
single-photon and SciFi detectors ·
applications in PID, RICH, tracking



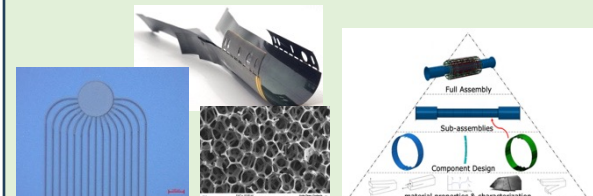
DRD5: Quantum Sensors

Quantum dots · superconduct.
nanowires · bolometers · TES ·
MMC · nuclear clocks
Applications in LEPP, first projects
in HEPP happening



DRD8: Mechanics

Ultra-thin beam pipes · CF foam and
new materials · curved, retractable
sensors · air & micro-channel cooling
· eco-friendly cooling fluids · robots ·
augmented reality



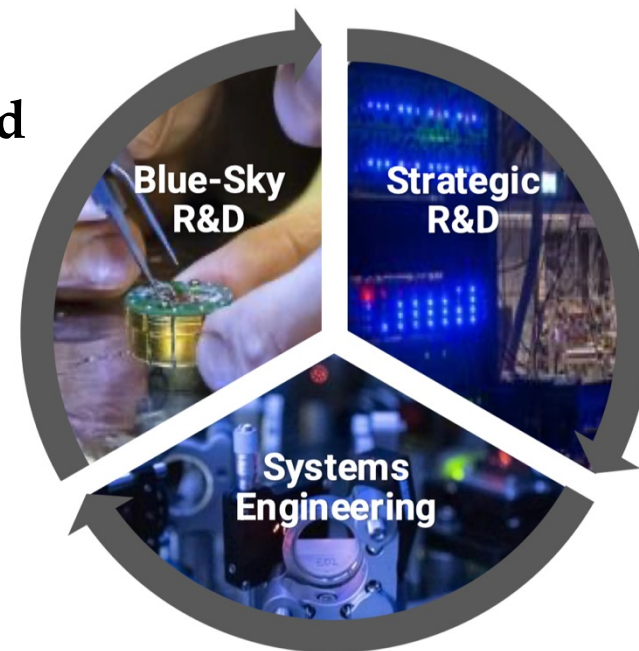
Summary

DRD collaborations have existed for 3 years and are now re-approved

- Evolve on a coherent work program over the next years
- Align R&D activities with priorities identified in the Strategy Update (i.e. FCC-ee)
- Secure funding

ESPP encourages Cross-DRD coordination

- Building on existing DRD structures & DRD Manager forum
- EDP proposes cross-DRD exchange forums to strengthen key priorities:
 - Knowledge transfer, Dissemination, Engineering support (between DRDs and FCC)
- Make existing structures work together better
 - Many of these statements have been made already at the 2020 Update of the European Strategy, being now more important than ever



Thank you
very much
for your attention