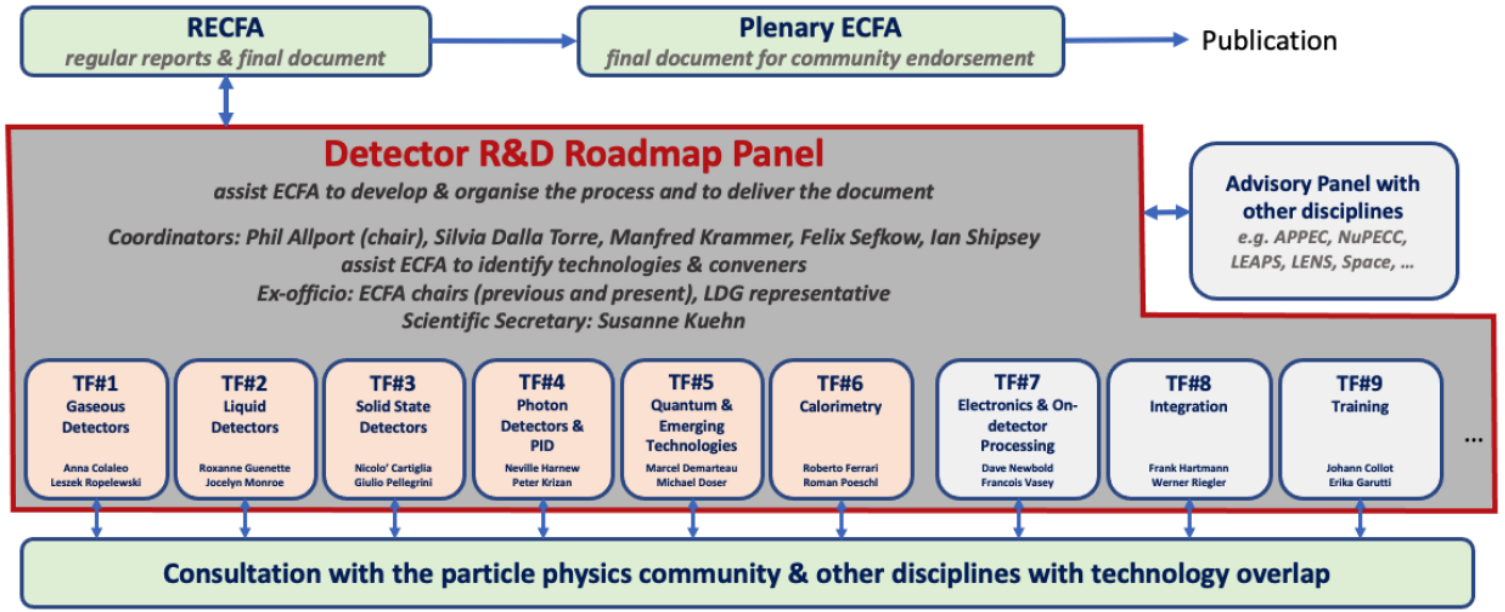
Implication française dans DRD1

Paul Colas, CEA/Irfu Université Paris Saclay

Detector R&D roadmap by ECFA : implementing European Strategy



Gaseous detectors in France

- Gaseous detectors are very useful at colliders :
  - For Large areas (muon chambers, hadronic calorimeters) : often the only affordable option
  - For tracking (cylindrical drift chambers, proportional chambers, straws, TPCs) : low matter budget, dE/dx for particle ID
- Long history in France: Large wire chambers for CDHS, Delphi TPC, Georges Charpak Nobel Price
- Gaseous detectors still in action in HEP:
  - ALICE @ LHC
  - T2K/ND280 at JPARC
  - TPC studies for ILC, considered for FCC
  - Shine,…

RD51 -> DRD1

- RD51 (from the long series of R&Ds reviewed by the LHCC) gathers since 2008 all the R&Ds on MPGDs
- ECFA recommendation is to ensure a transition to DRD1 in the framework of the ECFA studies. More aimed at (CERN) physics program, though ‘other applications’ are allowed
- This will be done by extending RD51 to Wire chambers, drift chambers, straws, RPCs/MRPCs…
- Maxim Titov and Eraldo Oliveri, co-spokes of RD51 this year, have the charge of the transition.
- A new WG structure (very much inspired by RD51’s) is proposed, with:
  - Extended convenership including experts from rattached technolgies
  - A large WG2 (‘Applications’) satisfying the ECFA requests
  - An additional WG8 (dissemination, organizing schools)
  - Still issues with MOUs, Work packages, overlaps with other DRDs… under discussion

DRD1

- Kick-off last week
- Next step : write proposals in WGs (end of March)
- Most of the French community is on T2K, Nuclear physics and medical applications. Not yet an FCC-oriented participation.
- Very early research in the recent years PICOSEC Micromegas <30 ps demonstrated, development to multipad, larger surfaces in progress

Present FCC-related activities

- Closest to this is the TPC for ILC
- TPC cooling with 2-phase CO2
- Operability of a TPC at FCC (ion space charge)
- Distortions : Serguei Ganjour, PC, in link with ALICE TPC, with KEK and other people at CERN and in China.
- Backgrounds at FCC/CEPC to be studied (starting)
- Ion back-flow suppression

RD51 Management Structure for 2023:

- ***Co-Spokesperson*** *– Eraldo Oliveri, Maxim Titov*
- ***Spokesperson Advisors*** *– Leszek Ropelewski, Silvia Dalla Torre*

- ***CB Chair*** *– Shikma Bressler*
- ***CB Deputy Chair*** *– Jochen Kaminski*

- ***Scientific Secretary*** *– Atsuhiko Ochi*

- ***Technical Coordinator:*** *Florian Brunbauer*

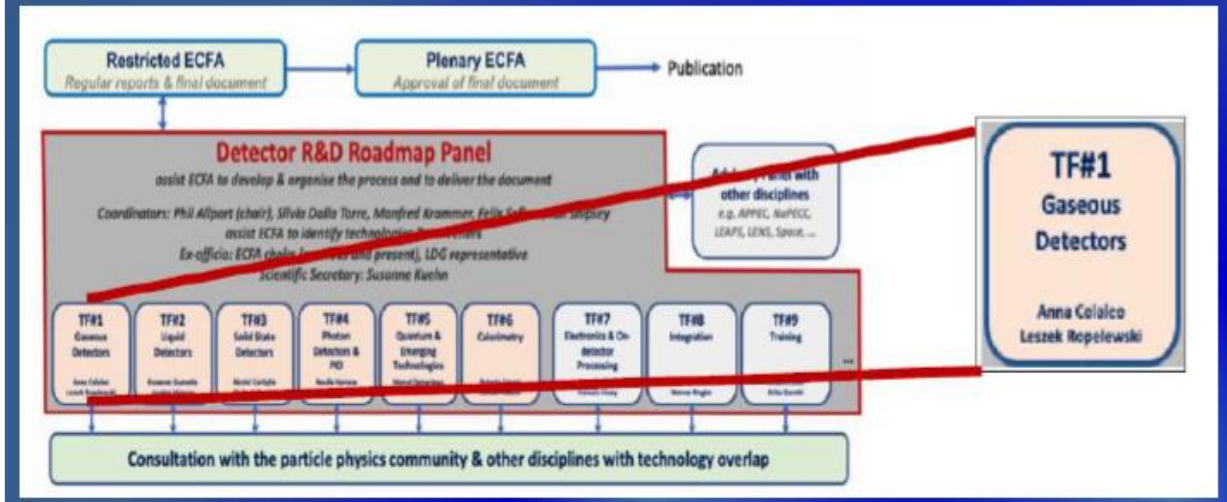
- ***Management Board*** *– Amos Breskin, Paul Colas, Klaus Dehmelt, Yannis Giomataris, Supratik Mukhopadhyay, Emilio Radicioni, Yorgos Tsipolitis, Joao Veloso, Andy White, Silvia Dalla Torre, Leszek Ropelewski, Atsuhiko Ochi, Shikma Bressler, Jochen Kaminski, Hans Taureg, Florian Brunbauer, Eraldo Oliveri, Maxim Titov*

- ***Changes to WG conveners:***
  - WG2: Piotr Gasik replacing Florian Brunbauer
  - New WG8 (Training and Dissemination): Florian Brunbauer, Mauro Iodice

- ***Co-Chairs of the RD51-DRD1 Review Panel:*** *Andy White, Emilio Radicioni, Paul Colas*

- *All RD51 WG conveners are members of the DRD1 WGs participating in the preparation of the DRD1 Kick-off workshop at CERN on Mar. 1-3, 2023*

Towards DRD1 (Gaseous Detectors) Collaboration



- ✓ ***Coordinated by the ECFA Detector R&D TF1 Conveners: Anna Colaleo and Leszek Ropelewski***
- ✓ ***Taking advantage of RD51 experience***

A dedicated DRD1 WG has been formed *(regular weekly meetings since Nov. 2022):*

- ✓ **ECFA TF1 Conveners**: *Anna Colaleo, Leszek Ropelewski*; **TF1 Members**: *Klaus Dehmelt, João Veloso*
- ✓ **ECFA Coordinators Group Member**: *Silvia Dalla Torre*
- ✓ **MPGDs**: *Eraldo Oliveri, Fulvio Tessarotto, Maxim Titov*
- ✓ **RPCs**: *Ingo Deppner, Giuseppe Iaselli, Barbara Liberti*
- ✓ **TPCs**: *Esther Ferrer Ribas, Jochen Kaminski*
- ✓ **Large volume detectors LDC**: *Marco Panareo, Francesco Renga*
- ✓ **Straw tubes, TGC, CSC, drift chambers, and other wire detectors:** *Peter Wintz*
- ✓ **Infrastructure, detector R&D programmes (CERN EP R&D, AIDAinnova)**: *Roberto Guida, Beatrice Mandelli*
- ✓ **Administrative support**: *Florian Brunbauer, Hans Taureg*