

# Stato RD\_FA per referees

Franco Bedeschi

Giugno 2021

## Sommario

- ❖ Sviluppi internazionali
- ❖ Commenti su lavoro in corso
- ❖ Impatto di Covid-19
- ❖ Situazione missioni
- ❖ Commenti finali

# Impegni internazionali

## ❖ Organizzazione e partecipazione (SPC e conveners):

### ➤ Passati:

- International Workshop on the High Energy Circular Electron Positron Collider – Shanghai, October 26-28, 2020
  - 9 INFN/RD\_FCC talks
- FCC week, 9-13 November 2020
  - FCCIS kickoff meeting → 3 INFN/RD\_FCC talks on MDI
  - 4th FCC Physics and Experiments Workshop → 12 INFN/RD\_FCC talks
- IAS program on HEP – Hong Kong – 14-21 Gen. 2021
  - 7 INFN /RD\_FCC talks

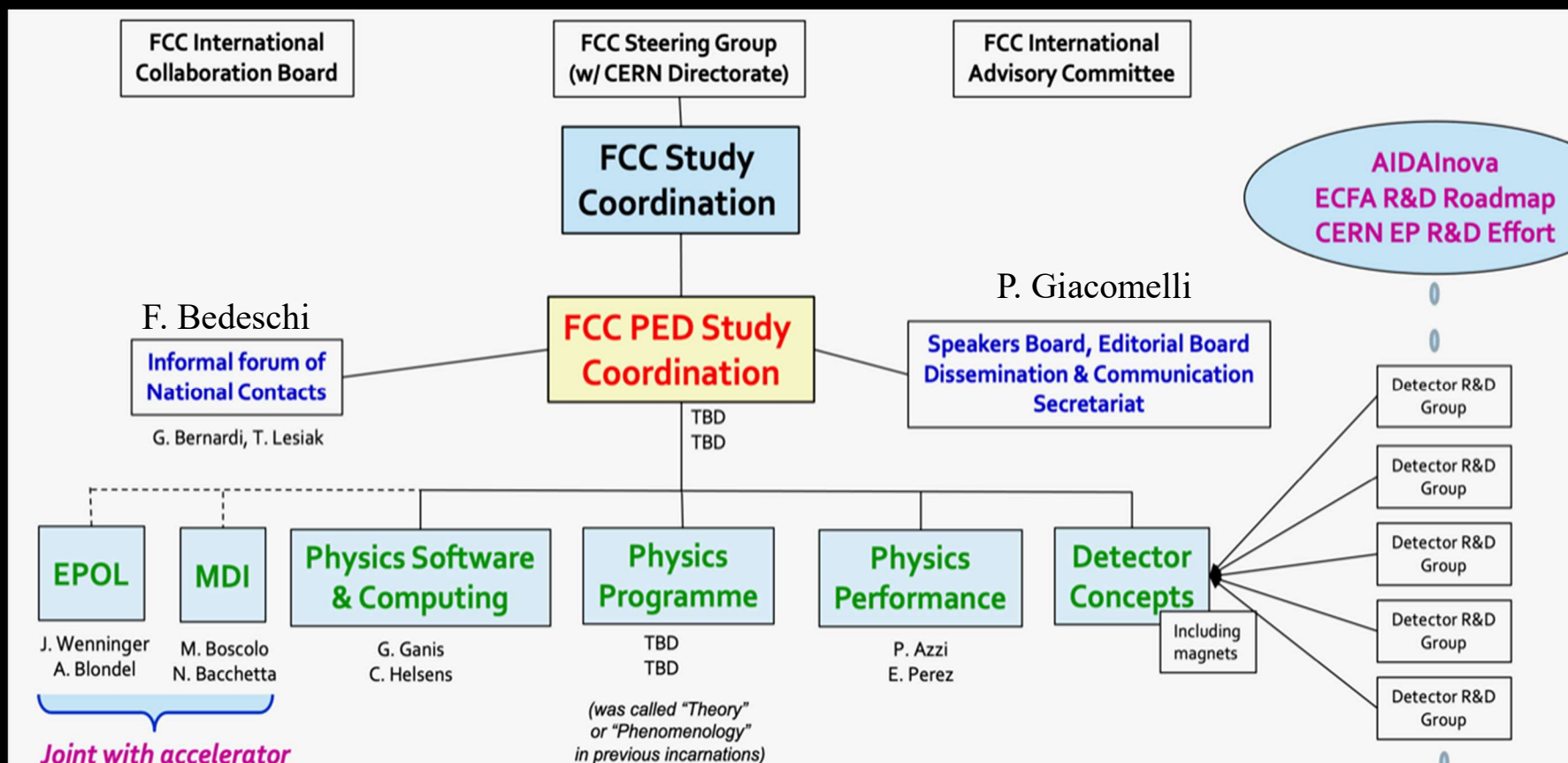
### ➤ Futuri:

- FCC week, June 28 - July 2, 2021
- ECFA workshops on e+e- Higgs/EW/Top factory, June 18, 2021 (kickoff)
- International Workshop on High Energy CEPC, TBD (Fall 2021)

# Organizzazione FCC

## ❖ Progressi nella definizione della struttura

- P. Azzi, F. Bedeschi e M. Boscolo in Steering Group di FCCee
- Molte slots ancora in fase di riempimento



# AIDAinnova approvato

## ❖ AIDAinnova new major EU grant:

- Grant agreement signed February 2021
- Objective:
  - To push detector technologies beyond the state-of-the art, with a special emphasis to the needs of a future Higgs factory, and to offer well equipped infrastructures for testing detector systems to the European particle physics community

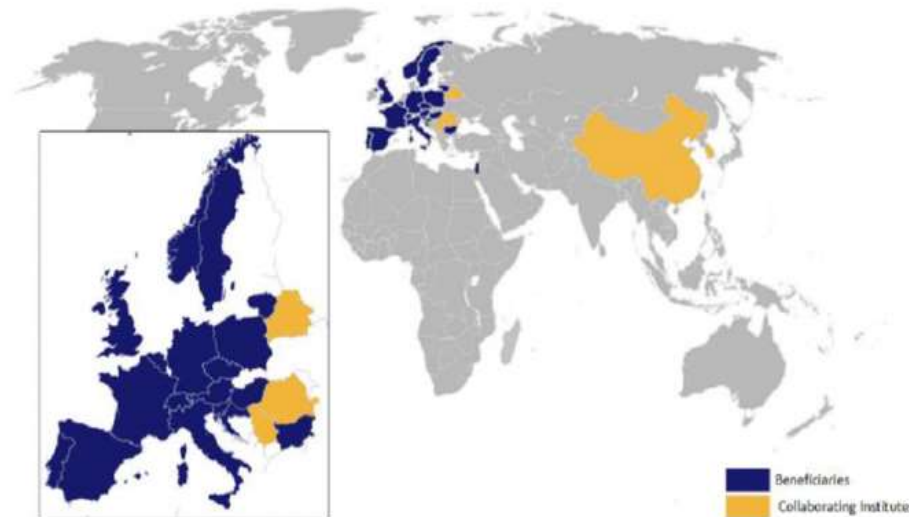
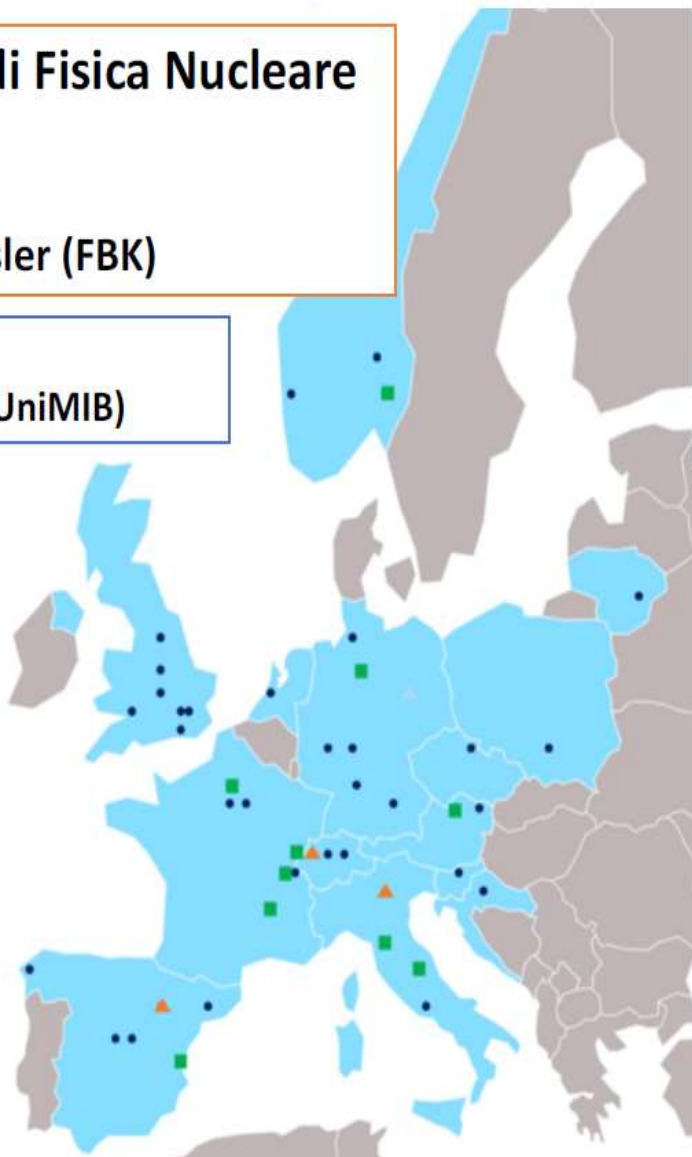
# AIDAinnova approvato

## AIDAinnova beneficiaries

Istituto Nazionale di Fisica Nucleare  
 CAEN S.p.A.  
 Eltos S.p.A.  
 Fondazione Bruno Kessler (FBK)

ASSOCIATED PARTNER:  
 GLASStoPOWER (spinoff-UniMIB)

Legend:  
 ● Academia  
 ■ Industry  
 ▲ RTOs



**45 beneficiaries/15 countries:**  
 34 academic + 11 industrial and RTOs  
 + 10 associated partners

**Project Coordinator:**  
 Felix Sefkow (CERN & DESY)

**FULL COST BUDGET : 22.3 Meu**  
**EC CONTRIBUTION: 10.0 Meu**

# AIDAinnova → INFN

## ❖ Molte attività' INFN connesse a FCCee in AIDAinnova:

- WP 5 – Pixel MAPS – tasks: 5.2.1/ 5.2.2
  - ARCADIA – M. da Rocha Rolo (TO)/Belle2 – F. Forti (PI)
- WP 7 – Gas Detectors – tasks: 7.3.2/ 7.4.1 [S. Dalla Torre (TS)]
  - $\mu$ Rwell chambers – G. Bencivenni (LNF)/Drift chamber – M. Primavera (LE)
- WP 8 – Calorimetry – tasks: 8.4.2 [R. Ferrari (PV)]
  - Dual readout calorimeter – G. Gaudio (PV)
- WP 10 – Cooling for VTX – tasks: 10.2
  - Cooling substrates/microcooling – F. Palla (PI)
- WP 11 – Microelectronics – tasks: 11.3 [A. Rivetti (TO)]
  - ASICS for  $\mu$ Rwell chambers – P. Giacomelli (BO), M. Rolo (TO)
- WP 12 – Software – tasks: 12.2.1 /12.4.2/ 12.5.2
  - Key4HEP – T. Boccali (PI)/MPGD simulation – G. Cibinetto (FE)
  - Particle flow for Dual readout cal. - B. di Micco (RM3)

# ECFA Roadmap

## ECFA Detector R&D Roadmap Process

### Organisation

**May 2020**  
EPPSU mandate to ECFA to develop a roadmap for detector R&D efforts in Europe

**Sep 2020**  
Structure in place with **Detector R&D Roadmap Panel**

**Dec 2020**  
Task Forces active

Website:

<https://indico.cern.ch/e/ECFADetectorRD/Roadmap>

### Expert & Community Consultation

**Feb 2021**  
Collection of requirements of future facilities & projects

**Feb/March 2021**  
Questionnaires of Task Forces to national contacts

Task Forces liaise with experts in

- ECFA countries
- adjacent disciplines
- industry

**March-May 2021**  
**Open Symposia**

### Drafting Roadmap & Feedback

**May 2021**  
Task Forces collate input from symposia

**25-28 May 2021 Drafting sessions**

- opening session with all experts involved
- plenary & parallel sessions with Task Force members
- final session of Roadmap Panel

**2 July 2021**  
Near final draft shared with RECFA\*

**30 July 2021**  
**Presentation at Joint ECFA-EPS session**

**Until Sep 2021**  
Collect final community feedback\*

**Oct 2021**  
**Detector R&D Roadmap Document** submission to RECFA and afterwards to PECFA and Council

\*community feedback via RECFA delegates and National Contacts

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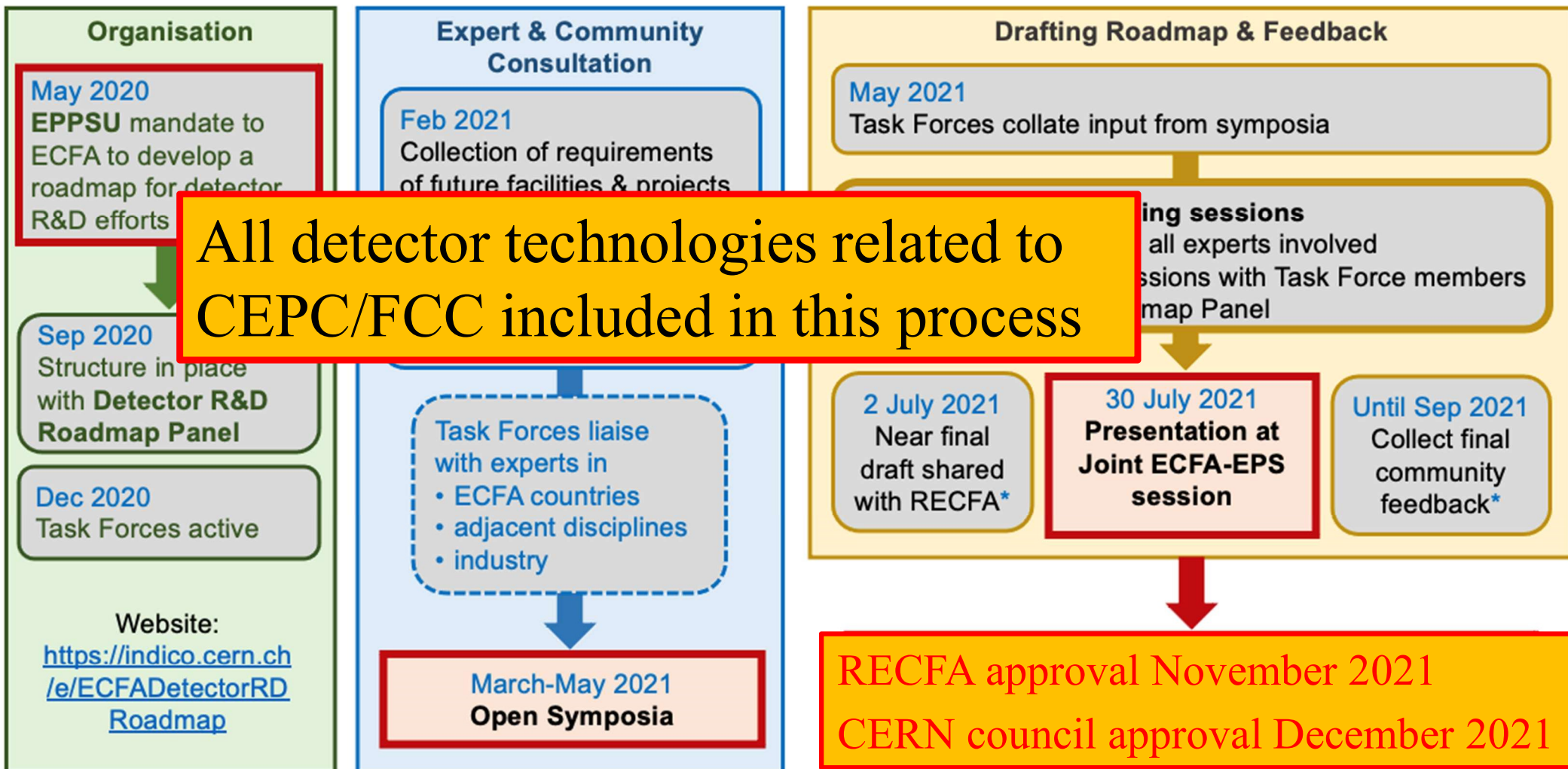
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# ECFA Roadmap

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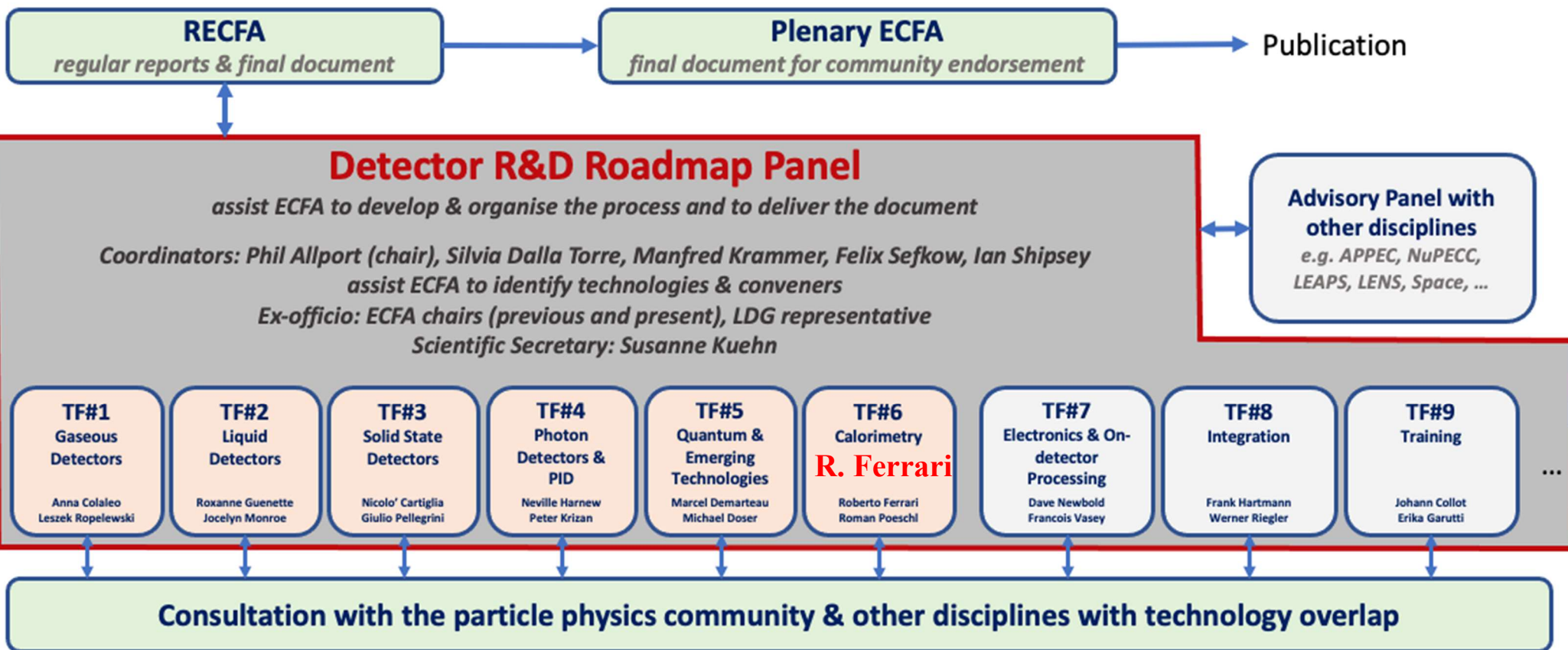
All detector technologies related to CEPC/FCC included in this process

RECFA approval November 2021  
CERN council approval December 2021

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# ECFA Roadmap

## Organization to structure the consultation with the community



<https://indico.cern.ch/e/ECFADetectorRD/Roadmap>

March-May 2021  
Open Symposia

RECFA approval November 2021  
CERN council approval December 2021

# Lavoro in corso

## ❖ Software (v. talk Patrizia):

- Fast simulation: aggiunta di timing e cluster counting PID
  - Grandi data sets prodotti e disponibili
- Progressi importanti su full simulation
- Consolidamento lavoro su case studies:
  - Higgs recoil, PRIN su EWK at Z pole, Pisa su 4 boson couplings

## ❖ Dual Readout (v. talk Gabriella)

- Enorme lavoro in corso per il prototipo (v. Gabriella e Romualdo)
  - Pronti per test prototipo a DESY tra poco
- Call CSN5 risottomessa, PRIN su D-SiPM

## ❖ Drift Chamber (v. talk Gianfranco):

- Molto lavoro per consolidare il cluster counting
  - Programma nuovo di test beam parassitico

# Lavoro in corso

## ❖ Camere $\mu$ RWell (v. Marco):

- Camera grande completata al CERN e in viaggio per Bologna
  - Setting up lab tests
- Camere test completate al CERN a costi superiori al previsto
  - Lavoro in corso per testarle sul fascio al CERN in Ottobre

## ❖ Dispositivi a silicio (v. Attilio)

- Sviluppo di soluzioni basate su tecnologie di DMAPs:
  - Potenzialmente utilizzabili sia per la regione di vertice che per Si-Wrapper.
- Stretti contatti con ARCADIA per lo sviluppo del rivelatore di vertice
- Diverse opzioni per i sistemi di grandi dimensioni (AtlasPix3)
- Cooling e meccanica

# Impatto Covid-19

- ❖ Workshops/meetings alla fine si sono fatti virtuali
- ❖ Test beams hanno subito grossi ritardi
  - Si riparte da giugno 2021 pero' sia DESY che CERN
- ❖ Missioni FEST completamente bloccate fino ad ora
  - Possibile ripartenza entro l'anno

# Missioni

## ❖ Nessuna spesa da gennaio 2021 (-50% ass. = 50 kE)

➤ Le cose ora si stanno muovendo. Confermati test beams previsti:

■ DESY 2 settimane a giugno per prototipo calorimetro

■ CERN 2 settimane in ottobre per test uRwell

➤ Altri test beams non previsti a settembre 2020: (+20 kE)

■ CERN 1 settimana+ in Agosto per calorimetro

■ Test drift tubes in parassitico al CERN per cluster counting

## ❖ Sblocchi:

➤ Tutti test beams:

■ BO: 8 kE, CT.dtz: 2 kE, FE.dtz: 5 kE, LNF: 5 kE, MI: 6.5 kE, PV.dtz: 9 kE, TO.dtz: 5 kE = 40.5 kE totale

➤ AidaInnova approvato → 2 kE a LE.dtz (+2.5 kE per ADC)

➤ Organigramma FCC → 5 kE a PD.dtz

# Missioni FEST

- ❖ **Programma sempre attivo e sara' esteso di 2 anni**
  - Possiamo in ogni momento utilizzarlo
  - Il coordinatore italiano Marco Maggiora invita a non toccare per il momento le assegnazioni e i SJ associati

# Commenti finali

- ❖ Molto lavoro fatto nonostante la pandemia
- ❖ Hardware:
  - Prototipi sviluppati. Molto lavoro di test beam da ora a fine anno
- ❖ Software;
  - Continua impegno importante per FCC su fast e full simulation
  - Cresce il lavoro su studi di fisica (case studies)
- ❖ Covid19 ha rallentato/cambiato un po' le cose, pero'
  - FCC si sta consolidando al CERN,
    - anche se con qualche incertezza ....
    - L'organizzazione sta prendendo forma e noi ci siamo
- ❖ Programma per 2022 ancora in fase di definizione