

ECFA-EPS Session

*EPS-HEP Conference, Hamburg
24th August 2023*

Karl Jakobs, ECFA Chair

ECFA

European Committee for Future Accelerators



ECFA Activities

Major ECFA activities are linked to the 2020 Update of the *European Strategy for Particle Physics*



(i) High-priority future initiatives:

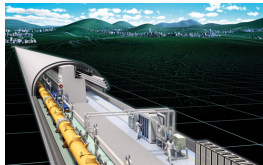
“An electron–positron Higgs factory is the highest–priority next collider. For the longer term, the European particle physics community has the ambition to operate a proton–proton collider at the highest achievable energy. ...”

→ FCC Feasibility Study (CERN)

→ ECFA Initiative on Physics, Experiment and Detector for a future e^+e^- collider

Support a series of workshops with the aim to share challenges and expertise, to explore synergies in their efforts and to respond coherently to this priority in the European Strategy for Particle Physics (ESPP).”

Goal: bring the entire e^+e^- Higgs factory effort together, foster cooperation across various projects;





SECOND • ECFA • WORKSHOP
on e^+e^- Higgs / Electroweak / Top Factories

11-13 October 2023
Paestum / Salerno / Italy

Topics:

- Physics potential of future Higgs and electroweak/top factories
- Required precision (experimental and theoretical)
- EFT (global) interpretation of Higgs factory measurements
- Reconstruction and simulation
- Software
- Detector R&D

[Second ECFA workshop on \$e^+e^-\$ factories](#)

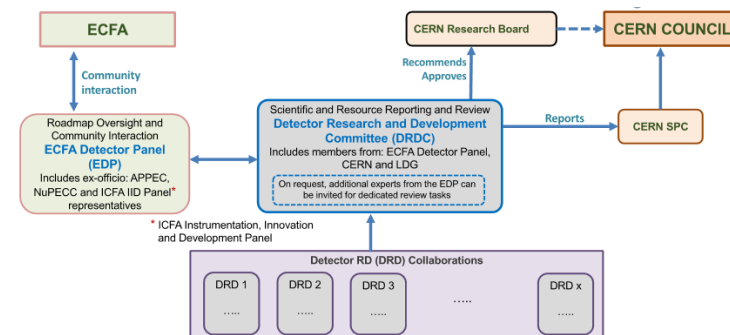
ECFA Detector R&D Roadmap

(ii) ESPP: “Organised by ECFA, a roadmap should be developed by the community to balance the detector R&D efforts in Europe, taking into account progress with emerging technologies in adjacent fields. The roadmap should identify and describe a diversified detector R&D portfolio that has the largest potential to enhance the performance of the particle physics programme in the near and long term. ...”

- [ECFA Detector R&D Roadmap](#) approved by Plenary ECFA in Nov 2021
- In Dec 2021 CERN Council mandated ECFA to work out a detailed implementation plan
- Implementation plan endorsed by CERN Council in Sept. 2022

Key feature: Detector R&D (DRD) Collaborations, anchored at CERN for the various technology areas

DRD proposals have been submitted (end of July 2023);
Review process ongoing



In parallel: Lab Directory Group (LDG) has developed a [Roadmap for Accelerator R&D](#)

→ status reports at the Nov. 2022 Open Plenary ECFA meeting at CERN: <https://indico.cern.ch/event/1212248/>

Detector R&D Roadmap: General Strategic Recommendations

GSR 1 - Supporting R&D facilities

GSR 2 - Engineering support for detector R&D

GSR 3 - Specific software for instrumentation

GSR 4 - International coordination and organisation of R&D activities

GSR 5 - Distributed R&D activities with centralised facilities

GSR 6 - Establish long-term strategic funding programmes

GSR 7 - Blue-sky R&D

GSR 8 - Attract, nurture, recognise and sustain the careers of R&D experts → **ECFA Training Panel**

GSR 9 - Industrial partnerships

GSR 10 - Open Science

Work on implementation of other GSRs is continuing

→ **Common ECFA-LDG working group** to address GSR1, GSR2, GSR3, GSR5, GSR9

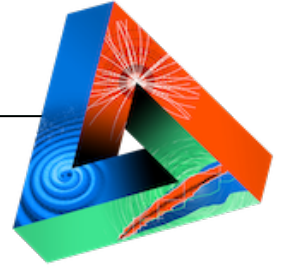
ECFA Early Career Researchers Panel

The objective of the [ECFA Early-Career Researcher \(ECR\) Panel](#) is for its members to discuss all aspects that contribute in a broad sense to the future of the research field of particle physics. In its advisory role to ECFA, the panel reports to ECFA on a regular basis. An annual report of the ECFA ECR Panel is added as a standing item to the agenda of Plenary ECFA meetings.



A selection of pictures of ECFA Early Career Researcher panel members

Joint ECFA – NuPECC – APPEC Activities



(i) [Joint ECFA NuPECC APPEC Seminar](#) in Madrid in May 2022

Discussion of joint activities, synergies, achievements and challenges in the three research areas

Joint activities:

Six [Expressions of Interest](#) endorsed: (ECFA participation in **blue**)

- [Dark Matter \(iDMEu\)](#)
- [Machine-learning Optimized Design of Experiments \(MODE\)](#)
- [Gravitational Waves for fundamental physics](#)
- [Nuclear Physics at the LHC](#)
- [Storage Rings for the Search of Charged-Particle Electric Dipole Moments](#)
- [Synergies between EIC and LHC](#)

+ new proposal under evaluation

EuCAIF: European Coalition for AI in Fundamental Physics



(ii) [JENA Computing Workshop](#) in Bologna in June 2023

Discussion on synergies in computing

→ Working groups to be set up (HPC, software, ML, ...)

