Paris Sphicas
CERN & NKUA
EPS HEP 2025
Marseille, July 10, 2025

- **Introduction**
- **ECFA Panels**
  - **HET Factory Studies**
  - **Detector Panel**
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ECFA session at EPS HEPP conference

- **The "ECFA session" in EPS HEP conferences is an old (precious) tradition**
  - ECFA has two plenary meetings per year:
    - Summer meeting outside CERN:
      - Even years at major European facility; odd years: EPS-HEP
    - End-of-year meeting at CERN
- **This year's ECFA session at the EPS conference is a short 1.5 weeks after the ESPP Symposium**
  - Given that the update of the European Strategy for Particle Physics is the highest priority item on our to-do list, this year's session is dedicated to the ESPP
  - Todays agenda:

ECFA overview	PS
ESPP: process, status and next steps	Karl Jakobs
ESPP: summary of Large Projects	Phil Burrows
ESPP: physics of Higgs-EWK-Top-QCD-BSM-flavor	Jorge de Blas
ESPP: physics of Dark Matter & Neutrinos-Cosmic Mesgrs	Pilar Hernandez
ESPP: summary of Computing and Instrumentation	Ulrich Husemann

ECFA: one-page introduction/summary

- **European Committee for Future Accelerators: https://ecfa.web.cern.ch**
  - **Plenary ECFA (PECFA): multiple representatives (1-10) per country**
  - **Restricted ECFA (RECFA): one representative per country**
    - **+ ex-officio members: CERN DG, CERN DRC, LDG Chair**
    - **+ observers: chairs of APPEC, NuPECC & EPS-HEPP board**
    - **+ representative of Early Career Researchers**
- **ECFA Charge ("Terms of Reference")**
  - **Long-range planning of European high-energy facilities – accelerators, large-scale facilities and equipment – adequate for the conduct of a valid high-energy research programme … matched to the size of this community and to the resources which can be put at the disposal of high-energy physics by society.**
  - **Equilibrium between the roles of international and national laboratories and university institutes in this research, and a close relation between research and education in high-energy physics and other fields.**
  - **Adequate conditions for research and a just and equitable sharing of facilities between physicists, irrespective of nationality and origin, as conducive to a successful collaborative effort.**
  - **… and "[ECFA is] advisory to CERN Management, CERN Council and its Committees, and to other organizations, national or international."**
    - **Country visits by RECFA: a very important dimension of the work of ECFA.**

Membership in ECFA

- **Membership:**
  - **All CERN member states + all European associate member states (of CERN)**
- **Two new countries joined ECFA in 2024/2025:**
  - **Latvia**
  - **Lithuania**
- **Also invited to join: Estonia.**

ECFA Panels and contributions to ESPP

ECFA Panels: HET Factory Study (I)

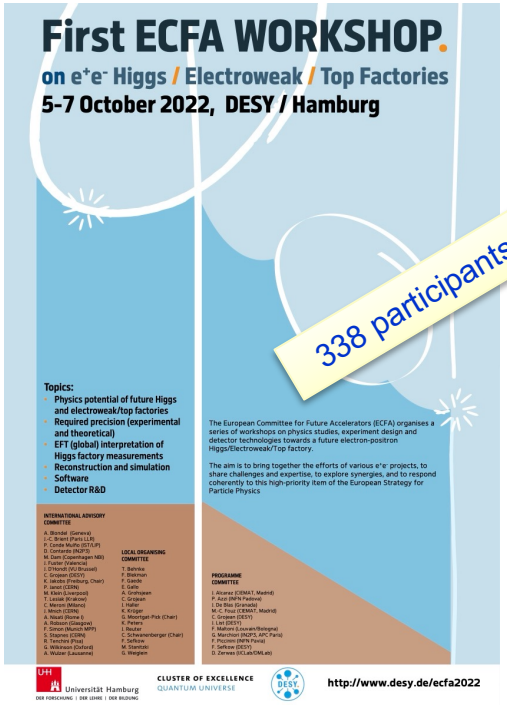
Web page

- **Higgs-Electroweak-Top (HET) Factory study:**
  - Based on the recommendations of the Update of the European Strategy for Particle Physics, …ECFA … to organise a series of workshops on physics studies, experiment design and detector technologies towards a future electron-positron Higgs/EW/Top factory.
  - Aim: bring together the efforts of various e^+e^- projects, to share challenges and expertise, to explore synergies and to respond coherently to this high-priority strategy item.

- **Three working groups:**
  - WG 1, Physics Potential:
    - Jorge de Blas (Univ. Granada), Patrick Koppenburg (Nikhef), Jenny List (DESY), Fabio Maltoni (UC Louvain/ Bologna). (+ Juan Alcaraz (CIEMAT).
  - WG 2, Physics Analysis Methods:
    - Patrizia Azzi (INFN-Padova / CERN), Fulvio Piccinini (INFN Pavia), Dirk Zerwas (IJCLab/DMLab).
  - WG 3: Detector R&D (WG3 web page):
    - Mary Cruz Fouz (CIEMAT Madrid), Giovanni Marchiori (APC Paris), Felix Sefkow (DESY).

ECFA HET Factory workshops

- **Three HET Factory workshops held in 2022-2024:**
  - First ECFA Workshop on e^+e^- HET Factories: 2022 @ DESY (GE)
  - Second ECFA Workshop on e^+e^- HET Factories: 2023 @ Paestum (IT)
  - Third ECFA Workshop on e^+e^- HET Factories: 2024 @ Paris (FR)



338 participants

138 participants

206 participants

ECFA HET Factory Study & Report

- **Original plan was to complete the study at the end of 2025**
  - **ESPP update commenced earlier than anticipated, with a deadline for submissions on March 31st, 2025.**
    - **Work had to be accelerated (significantly).**
- **Editors:**
  - **A. Robson (Glasgow) and C. Leonidopoulos (Edinburgh)**
- **Many thanks (and congratulations) to**
  - **All participants – for all the energy and effort they have been investing on this study**
  - **Special thanks to the coordinators of the three WGs for putting together**
  - **The members of the International Advisory Committee.**
  - **The two previous ECFA chairs, Jorgen D'Hondt, who initiated the study, and Karl Jakobs who nurtured it in the most crucial period.**
  - **Very special thanks to Aidan and Christos who toiled tirelessly.**

The report from the ECFA HET Factory study was submitted to the ESPP:

ESPP entry 141 (10-page executive summary + full report).

And is now published:

As CERN Yellow Report

Also on arXiv

Results from HET Factory study are being used by ESPP Physics Preparatory Groups.

ECFA Detector Panel: contribution to ESPP

- **Co-chairs: Didier Contardo (IN2P3-Lyon) and Felix Sefkow (DESY)**
  - Contribution here.
- **Quick summary of major points:**
  - Overall, the DRDs are an opportunity to organize common activities and gathering of resources to evolve coherently from the state-of-the-art iterative developments towards their evolution to new technologies and methodologies.
  - This is a major objective that should be consolidated during the first R&D phase.
  - Resources: Estimates of scale of available resources/ additional needs to complete initial programs were provided by the DRDs in their proposals to the DRDC.
    - Overall, ~60% of the personnel and ~40% of the budget appear to be available.
    - DRD5 is an exception; low TRL and large participation and resourcing outside of the HEP field.
  - ECFA Roadmap continues to provide guidance, as long as future projects are yet to be approved. Once these decisions are made, a stronger focus and informed scheduling of strategic R&D shall be required, and updates of the roadmap should be considered.
- **Outside ESPP submission: EDP coordination of DRD managers forum.**
  - Formation of MoUs of the DRD collaborations & other cross-DRD issues.

ECFA Training Panel: contribution to ESPP

- **Co-chairs: Johann Collot (Grenoble) + Erika Garutti (Univ. of Hamburg)**
  - **Contribution here.**
- **Proposal for establishment of a comprehensive curriculum in instrumentation, with three levels: Beginner, Intermediate, and Advanced.**
  - **Beginner: through university master's and graduate programs. Further supported by supplementary online and/or in-person lectures compiled by, e.g., the ECFA TP.**
  - **Intermediate: for final-year master's students and first-year PhD candidates who have attained the beginner level. New European school of instrumentation, to be established under the auspices of ECFA, potentially supported by CERN:**
    - **One-week optional introductory course for students who have not acquired the basics of instrumentation at their home university, and**
    - **A two-week intermediate course for final year master's students and starting PhD researchers, aiming to bridge the gap between the beginners' courses and advanced training focused on specific detector technologies.**
    - **Balance between lectures and lab sessions. Need lab space, instructors…**
  - **Advanced: late-stage PhD researchers and early-stage postdoctoral researchers who have attained Intermediate level. List compiled and showcased on the ECFA TP web page. DRD collaborations are encouraged to create specialized advanced schools tailored to their fields.**
    - **Existing examples: DRD1: Gaseous Detectors School, DRD3/AIDAInnova.**

ECFA ECR panel

- **There was no contribution to the ESPP from the ECFA ECR panel**
- **Instead, the panel endorsed a contribution submitted by a group of ECRs on behalf of European ECRs.**
  - **Early Career Researcher Input to the European Strategy for Particle Physics Update — Fifty-five recommendations for the future of our field**
  - **Contribution to the ESPP is here.**

Joint ECFA-NuPECC-APPEC (JENA) activities:

JENAS2025 (triannual symposium)
Contribution to ESPP on Computing

JENAS 2025

- **All-plenary format**
  - 1st day: Physics Highlights and Challenges:
    - Astroparticle, Nuclear, Particle physics (3 talks)
  - 2nd day: JENA working groups + detector R&D
    - (a) Dark Matter, Gravit. Waves, ML for Exp design, Nuclear physics @ LHC, Storage rings, EIC-LHC synergies, Europ. Coalition for AI in fundamental physics
    - (b) Detector R&D in ANP physics (3 talks)
  - 3rd day: Summaries for FA reprs
    - (a) Open questions, detector challenges, ECR report, talk by EU representative.
    - (b) Computing Working Groups & White Paper
    - (c) Training, DEI, ToK
  - 4th day: Strategy summaries by ECFA, NuPECC and APPEC chairs

JENAS 2025


JENAS 2025
3rd Joint ECFA-NuPECC-ApPEC Synposium
Exploring synergies between Particle, Astroparticle and Nuclear Physics
Hosted in Didcot, UK. From the 9th - 11th April 2025
ECFA
NuPECC
APPEC
For more detail:

JENAA Computing Working Group

- **The Computing WG was created as a follow-up to the 2022 JENA Symposium in Madrid and the meeting with Funding Agency representatives**

- **Five (5) Working groups, with 2/3 conveners each (from different areas)**
  - **HTC and HPC (HPC): WG1 web page.**
  - **Software and Heterogeneous Architectures (Software): WG2 web page.**
  - **Federate Data Management, Virtual Research Environments and FAIR/Open Data (Data): WG3 web page.**
  - **Machine Learning and Artificial Intelligence (AI): WG4 web page.**
  - **Training, Dissemination, Education (TDE): WG5 web page.**

- **ENA Computing Working group contribution to ESPP:**
  - **Prepared by WG co-coordinators and ENA chairpersons**
    - **JENA White Paper on European Federated Computing.**
    - **The document, along with the longer WG reports were presented also at JENAS 2025 for discussion with the Funding Agency representatives.**
    - **WG reports: https://www.nupecc.org/jenaa/index.php?display=reports.**

Miscellanea

ECFA meetings in 2025/2026

- **RECFA country visits in 2025:**
  - Bulgaria (Sofia): Mar 7-8 ✓
  - Finland (Helsinki): May 30-31 ✓
  - Belgium (Brussels): Sep 12-13
  - Turkey (Istanbul): Oct 31-Nov 1
- **Plenary meetings in 2025:**
  - PECFA summer meeting: EPS HEP Conference (ECFA session on July 10)
  - PECFA fall/winter meeting: 20-21 Nov
- **JENA Symposium 2025 (JENAS 2025):**
  - UK (RAL): Apr 8-11 ✓
- **Plan for 2026: Five country visits:**
  - Spain: March 6-7
  - Romania: June 5-6
  - Netherlands: July 8
  - Austria: Sep 11-12
  - Slovakia: Oct 23-24
- **Plenary meetings:**
  - PECFA summer meeting: Amsterdam July 9-10
  - PECFA fall/winter meeting: CERN, Nov 19-20