ESG WG6 Report
Public engagement, education, communication
Social and career aspects
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Beyond Discoveries:
Particle Physics in Service of Society

The Particle Physics Community as a Model of Scientific and Societal Leadership

- International scientific collaboration as a driver for peace
- Scientific facts and critical thinking as cornerstones of truth
- Diversity, equity, and inclusion as strategy for institutional success

Let us engage with society and highlight the success of particle physics, built on these shared values.

ESG Working Group 6

WG6 members reviewed the input received and identified key topics during the month of May.

Next step: Organize the material into:

- **Guiding principles:** What should we stand for?
- **Good practices:** What works well, and how can it be sustained?
- **Recommendations:** What actions are needed, and by whom?
- → **The following is an overview of the received input; need to discuss what is reasonable, useful, and relevant to retain as final recommendations**
- → Work in progress — further feedback is welcome!

WG6 Composition

- M. Bombara (Slovakia)
- M.J. Costa (Spain)
- L. de Paula (Brazil)
- S. Özkorucuklu (Türkiye)
- M. Pimenta (Portugal)
- P. Van Mechelen* (Belgium)
- L. Zivkovic (Serbia)
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Engagement, Education, and Communication

General guiding principles

Outreach and Communication

- Strengthen public trust in science through outreach that fosters critical thinking, counters misinformation, and inspires future scientists.
- Shift science communication from scientific discoveries to research processes, personal stories, and the value of international collaboration and DEI.
- Expand outreach to diverse and underrepresented audiences to boost interest in STEM. Use social media to ensure a broad reach.
- Communicate effectively and transparently to build public and political support for the next European flagship project.

Training and Education

- Strengthen training in instrumentation (and thereby support a timely execution of the ESPP).
- Establish closer ties with industry.
- Integrate modern physics into school curricula.

Open Science

- Promote Open Access to scientific knowledge.
- Encourage the use of Open Data in education, outreach, and citizen science.

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Some good practices

- Open Access and Open Data platforms such as the INSPIRE, HEPDATA, Particle Data Group, ArXiv, . . .
  $\rightarrow$ may need a broader funding base (beyond CERN, INFN, DESY, . . .)
- Accelerator Training such as the CERN Accelerator School:
  $\rightarrow$ may serve as a model for instrumentation training
- Outreach groups and initiatives such as the CERN Education, Communications & Outreach Group, EPPCN, IPPOG, Teacher & Student Forum, CERN Festival Programme, CERN Openlab, PolarQuEEEst, . . .
  $\rightarrow$ these key platforms for outreach and education could be expanded and strengthened

Actionable recommendations

Coordination of Outreach, Education, and Communication

- Strengthen European education, communication, and outreach strategy, led by CERN and Member States, supported by a central office with dedicated staff and funding.
- Coordinate various outreach networks (Education, Communication & Outreach group, EPPCN, IPPOG, Teacher & Student Forum). Promote coordination with related scientific fields to improve efficiency and avoid duplication.
- Provide outreach training and create a European platform for sharing materials and best practices. Evaluate outreach impact through surveys and tracking of educational and career outcomes.
- Develop educational programmes with teachers and students to integrate modern physics into school curricula.

Training in HEP

- Develop structured European training programmes in instrumentation, including a certified curriculum (e.g. Erasmus Mundus) linked to R&D and industry.
- Establish a graduate school in instrumentation with defined certification levels linked to the training branch within the ECFA detector roadmap and to DRD Collaborations.

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Social and Career Aspects

General guiding principles

Improve stability and perspectives for ECRs

- Increase awareness about employment perspectives at the earliest stages of ECR careers.
- Promote postdoc contracts of at least 3 years and increase long-term positions aligned with project timelines.
- Expand mentorship to support ECRs in career development, skills, and personal growth.
- Ensure timely decisions on flagship projects to retain attractivenes of the field to ECRs.

Recognition and evaluation

- Acknowledge contributions equally in accelerator, computing, detector, analysis, and theory. Value non-research activities (e.g. outreach, DEI, mentoring) and expand evaluation criteria beyond bibliometrics.
- Facilitate the recognition of individual scientific contributions in large collaborations and recognize the training value of smaller experiments.
- Reassess long-term mobility expectations and foster a healthier work-life balance.

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Training and engagement

- Embed transferable and entrepreneurial skills in training.
- Encourage ECR involvement in instrumentation and accelerator R&D.
- Include ECRs in the organisation of collaborations, working groups, and conferences; establish dedicated ECR sessions where possible.

Diversity and Inclusion

- Promote diversity, equity, and inclusion to drive innovation and better decision-making.
- Value and recruit candidates with industry experience.
- Enforce zero-tolerance for harassment/discrimination with accessible and anonymous reporting systems.

Some good practices

- International Office at DESY: to ease the moving to a new country
- Mentoring schemes, incl. mental health mentoring, gender mentoring implemented at various institutions.
- Diversity and Inclusion programme at CERN
  $\rightarrow$ CERN should maintain its commitment to DEI policies that enrich its working environment, including support to users who originate from countries where they do not have adequate protections.
- Centres for Doctoral Training in the UK include a 6-month industry placement

Actionable recommendations

Recruitment and mobility

- Develop PhD programmes with industry placements to support career mobility.
- Create an international support body (e.g. under CERN) to facilitate researcher relocation; institutions should offer expert assistance and include relocation funding in ECR contracts.

Well-being and DEI

- Fund mental health support (if not included in standard health insurance), with targeted services for ECRs.
- Ensure institutions, conferences, and schools have clear codes of conduct and complaint procedures.
- Set up DEI Offices with appropriate resources.
- DEI Offices should monitor progress via surveys and ECR-inclusive committees; publish regular reports.
- Enable individuals with diverse disabilities to engage in science and outreach by providing tailored accessibility tools.

ECR engagement

- Provide funding for ECFA ECR Panel activities, including community-building and professional development.
- Ensure transparent selection and balanced representation in the ECFA ECR Panel across countries and research areas.

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Summary

Most salient topics (according to me)

Instrumentation & link with industry

- Strengthen training in instrumentation, and in transferable and entrepreneurial skills.
- Establish closer ties to industry, including industry placement of PhD students and hirings from industry into instrumentation jobs.

ECR career perspectives

- Short-term contracts, frequent relocations, and uncertain job perspectives weigh in on ECR's mental health and work-life balance.
- Activities in computing, accelerators, instrumentation not always well recognized.
- Not clear whether these practices ensure that we keep the best talents in the field.

Feedback welcome!

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