



University of Antwerp  
| Particle Physics Group

# European Strategy for Particle Physics Update

Plans for Belgian community input

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be.hep Solstice Meeting, 19 December 2024

# What is the ESPP?

## European Strategy for Particle Physics

- Mandated by the CERN Council to set the long-term future of the field
- Regularly updated (previously in 2013 and 2020)
- <http://europeanstrategyupdate.web.cern.ch/>

### Priorities from the 2020 update

- full exploitation of the (HL-) LHC
- investigation of a future hadron collider at CERN with  $\sqrt{s} \geq 100$  TeV, with a  $e^+e^-$  Higgs and EW factory as a possible first stage
- continued development of scientific programmes beyond colliders at CERN
- develop roadmaps for R&D in accelerator and detector technologies

# Third Update of the ESPP

## Remit of the European Strategy Group

Develop a visionary and concrete plan for the realisation of the next flagship project at CERN, attracting international collaboration and allowing Europe to continue to lead the field.

- Timeline approved by CERN Council in March 2024
- Strategy Secretariat and European Strategy Group established in June 2024
- Physics Preparatory Group established in September 2024
- Should include the **preferred option** for the next collider at CERN and **prioritised alternative options**
- Should also indicate **priorities complementary to colliders** at CERN and other laboratories inside and outside Europe
- Expect to submit draft Strategy Document to Council by January 2026
- Final ratification by Council in June 2026

# The European Strategy Group

Set up by Council to establish a proposal for the third update of the **medium- and long-term European Strategy for Particle Physics**

## Composition

- Strategy Secretary (acting as chair)
- One representative per CERN Member state (→ **PVM for Belgium**)
- One representative appointed by each “Large Particle Physics Laboratory”
- CERN Director-General and CERN Director-General-elect
- SPC (Scientific Policy Committee) and ECFA (European Committee for Future Accelerators) chairs

Also invited: President of the CERN Council, one representative per Associated Member and Observer State, one representative of the European Commission, APPEC, NuPECC, and ESFRI chairs, members of the Physics Preparatory Group

# The ESG Working Groups

The ESG will work on the following topics

- National input for the Strategy update / scientific diversity in European particle physics
- Project comparison group
- Implementation of the Strategy / Deliverability of larger projects
- Relations with other fields of physics
- Sustainability and environmental impact
- Public engagement, education and communication
- Social and career aspects for the next generation
- Knowledge and technology transfer

# The Physics Preparatory Group

Set up by Council to prepare the **scientific contribution** to the work of the European Strategy group and to prepare a **Physics Briefing Book**, based on input from the community

## Composition

- Strategy Secretary (acting as chair)
- Eight members appointed by Council (4 on recommendation of SPC, 4 on recommendation of ECFA) (→ **Fabio Maltoni**)
- One representative of CERN
- Two representatives of the Americas and two representatives from Asia (appointed by ICFA)
- The SPC, ECFA, and LDG chairs

# Timeline



## Other relevant information will become available by the end of 2025

- FCC Feasibility Study
- Clearer view on the international landscape for future colliders

# Input from national communities

## Facilitate wide discussions

- Engage maximum number of colleagues, especially Early Career Researchers
- Suggestion to hold national meetings organized by RECFA delegate and ESG representative (→ Nick van Remortel and PVM)
- Questionnaire prepared by ECFA

## Deadlines

- 31 March 2025: main input from the community
- 26 May 2025: further input in advance of the Open Symposium
- 14 November 2025: final input, following the submission of the Physics Briefing Book and prior to the Drafting Session



# ECFA Questionnaire

## Next collider at CERN

- (a) Which is the preferred next major/flagship collider project for CERN?
- (b) What are the most important elements in the response to (a)?  
physics potential / long-term perspective / financial and human resources (incl. effects on other projects) / timing / careers and training / sustainability
- (c) Should CERN/Europe proceed with the preferred option set out in (a) or should alternative options be considered?  
if Japan proceeds with the ILC / if China proceeds with the CEPC / if the US proceeds with a muon collider / if there are major new (unexpected) results from the HL-LHC or other HEP experiments
- (d) Beyond the preferred option in (a), what other accelerator R&D topics should be pursued in parallel?  
e.g. high-field magnets / RF technology / alternative accelerators
- (e) What is the prioritised list of alternative options if option (a) is not feasible?
- (f) What are the most important elements in the response to (e)?

## Non-collider projects and other fields

- (a) What other areas of physics should be pursued, and with what relative priority?
- (b) What are the most important elements in the response to (a)?
- (c) To what extent should CERN participate in nuclear physics, astroparticle physics, or other areas of science, while keeping in mind and adhering to the CERN Convention?

# Update process in Belgium

## National community meeting: February 5, UAntwerp

- Full day meeting at the UAntwerp City Campus
- Purpose: get informed about main projects of interest to Belgian community
- Programme is being developed (topics proposed via [Google doc](#))
- **Please register!** (no fee)
- <https://indico.cern.ch/e/BIESPPU>

## Follow-up

- Discussion within your group/laboratory
- Second meeting to converge on national input  
→ format/date not defined yet, could be a meeting with delegation of staff members, ECRs, ...

**Questions, feedback, suggestions?**

