

Update of the European Strategy for Particle Physics

CERN Council has initiated an update exercise to the European Strategy for Particle Physics which was approved by a special Council Session held in Lisbon on 14 July 2006

The old, 2006 strategy statements can be found here:

<http://council-strategygroup.web.cern.ch/council-strategygroup/>

The European Strategy Group (ESG)

The remit of the ESG is to establish a proposal for an Update of the medium and long-term European Strategy for Particle Physics, for approval by the Council. It is expected that the proposal will take the following elements into account:

The Update of the European Strategy for Particle Physics shall in particular aim at:

- Enhancing the visibility of existing European particle physics programmes;**
- Increasing collaboration among Europe's particle physics laboratories, institutes and universities;**
- Promoting a coordinated European participation in global projects and in regional projects outside Europe;**
- Encouraging knowledge transfer to other disciplines, industry, and society.**

The proposal shall take into account the experience from the implementation of the 2006 Strategy, as well as of the structures and procedures currently in place with regard to the strategy.

The proposal shall outline priorities following a thematic approach, with special emphasis on future large infrastructures/projects, including possibilities for a next project at CERN after LHC in a global context, and consider time scales and resources. It shall also consider the possibility of CERN participating in experiments outside the Geneva Laboratory as part of the Strategy implementation.

The proposal shall comprise a series of ordered and concise statements of 1-2 lines each, or 1-2 pages in total followed by more detailed presentations that shall not exceed 25 pages.

Members of the ESG are one delegate from each Member State, CERN DG, representatives of major European National Labs, Strategy Secretariat members, and invited delegates from candidates for accession, observer states and other relevant organizations (about 46 total)

The European Strategy Preparatory Group (ESPG)

The ESPG prepares the gathering of the information needed for the work of the ESG.

The ESPG is composed of the Strategy Secretariat members, four members from each SPC and ECFA, one from CERN, and one each from Asia and the Americas (total 15)

Tatsuya Nakada is the chairperson of both ESG and ESPG
(Emmanuel Tsesmelis helps logistics as Scientific Assistant)

Web page to the Update of the European Strategy for Particle Physics

<http://europeanstrategygroup.web.cern.ch/EuropeanStrategyGroup/welcome.htm>



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The European Strategy for Particle Physics

At appropriate intervals, at most every 5 years, the European Strategy Session of Council will re-enact the process aimed at updating the medium and long-term European Strategy for Particle Physics, by setting up a Working Group, the [European Strategy Group \(ESG\)](#), similar to the Strategy Group in 2005/2006. The ESG will be a Working Group of Council which will cease to exist each time Council has adopted the new medium and long-term Strategy. The remit of the ESG will be to establish a proposal for the European Strategy Session of Council to update the medium and long-term European Strategy for Particle Physics.

Council, September 2007

For the purposes of the Strategy Update, the ESG will be assisted by an ad hoc Preparatory Group.

***Web page will become available on 1st February for submissions
(will be linked from the main Web page)***

Call for Submissions

As part of the [Update of the European Strategy for Particle Physics](#), the European Strategy Preparatory Group welcomes submissions on issues related to the strategy from individual physicists, from groups of scientists representing a community (an experiment, a topic of theoretical research, etc.) as well as from Institutions and Organizations (funding agencies, ministries, etc).

These contributions will be discussed at the meetings of the Preparatory Group and during the Open Symposium, and made available to the Strategy Group for drafting the Update of the Strategy.

Input can be submitted by e-mail in the form of a simple letter, a report, or a link to existing documents brought to the attention of the ESPG.

In addition, everyone is encouraged to attend the Open Symposium, to be held on 10-12 September 2012 at Cracow, where ample time within each session will be dedicated for discussion and input from the floor.

The input from the younger generation is explicitly encouraged

How

Send your contribution on the scientific issues to the appropriate address below:

[Accelerator Physics](#)

[Astroparticle Physics, Gravitation and Cosmology](#)

[Flavour Physics and Symmetries](#)

[Physics at High Energy Frontier](#)

[Physics of Neutrinos](#)

[Strong Interaction Physics](#)

[Particle Physics Theory](#)

[General infrastructure and facilities](#)

[General comments](#)

Each input document should be self-contained (no external links except in the references), less than 15 pages and in PDF format.

Should you encounter problems sending a file, please send a short message using this [address](#).

Unless the authors request otherwise, the documents will be made public on the Strategy Group Web-page.

Timeline for Update of European Strategy

Open for Submissions on scientific issues ~ 1 February 2012

Submissions closed for the Open Symposium 31 July 2012

All submissions will be made available to the speakers and the session-chairs of the Open Symposium.

Open Symposium (at Cracow) 10-12 September 2012

Submissions closed for being included in the Briefing Book to the Strategy Group 15 October 2012

Strategy Group meeting to draft Update of Strategy 21-26 January 2013

Finalizing Update of Strategy by CERN Council March 2013

Special Council Session to adopt Update of European Strategy in Brussels May/June 2013

By the way, very useful overviews and summaries of all fields can be found in the slides (or videos) of the ICFA Seminar at CERN of last October:

<https://indico.cern.ch/conferenceOtherViews.py?showSession=all&showDate=all&view=standard&confId=113370>

An illustrative set of questions proposed from one thematic group:
(just as an example)

In the context of 'Physics at the High Energy Frontier', we request input in particular (but not only) to the following questions:

1. What have we learned from the first data from the LHC so far which has impact on the future strategy?
2. What are the consequences to be drawn from a discovery / an exclusion of a SM-like Higgs boson until the end of the 2012 LHC run? How well could the Higgs properties be measured at LHC?
3. Do the exclusions of certain BSM models/parameters already have impact on the planning of next facilities?
4. Given the new input what is the physics case for LHC luminosity upgrade / linear collider ≤ 1 TeV / linear collider ≤ 3 TeV / higher energy hadron collider / muon collider?
5. Which kind of R&D should be pursued for both accelerators and detectors of the above with which priority?

Additional material

The European strategy for particle physics

Particle physics stands on the threshold of a new and exciting era of discovery. The next generation of experiments will explore new domains and probe the deep structure of space-time. They will measure the properties of the elementary constituents of matter and their interactions with unprecedented accuracy, and they will uncover new phenomena such as the Higgs boson or new forms of matter. Long-standing puzzles such as the origin of mass, the matter-antimatter asymmetry of the Universe and the mysterious dark matter and energy that permeate the cosmos will soon benefit from the insights that new measurements will bring. Together, the results will have a profound impact on the way we see our Universe; *European particle physics should thoroughly exploit its current exciting and diverse research programme. It should position itself to stand ready to address the challenges that will emerge from exploration of the new frontier, and it should participate fully in an increasingly global adventure.*

General issues

1. European particle physics is founded on strong national institutes, universities and laboratories and the CERN Organisation; Europe should maintain and strengthen its central position in particle physics.
2. Increased globalisation, concentration and scale of particle physics make a well coordinated strategy in Europe paramount; this strategy will be defined and updated by CERN Council as outlined below.

Scientific activities

3. The LHC will be the energy frontier machine for the foreseeable future, maintaining European leadership in the field; the highest priority is to fully exploit the physics potential of the LHC, resources for completion of the initial programme have to be secured such that machine and experiments can operate optimally at their design performance. A subsequent major luminosity upgrade (SLHC), motivated by physics results and operation experience, will be enabled by focused R&D; so this end, R&D for machine and detectors has to be vigorously pursued now and generally organised towards a luminosity upgrade by around 2015.
4. In order to be in the position to push the energy and luminosity frontier even further it is vital to strengthen the advanced accelerator R&D programme; a coordinated programme should be transferred, to develop the CLIC technology and high performance magnets for future accelerators, and to play a significant role in the study and development of a high-bruosity neutrino facility.
5. It is fundamental to complement the results of the LMC with measurements at a linear collider. In the energy range of 0.5 to 1 TeV, the ILC, based on superconducting technology, will provide a unique scientific opportunity at the precision frontier; there should be a strong well-coordinated European activity, including CERN, through the Global Design Effort, for its design and technical preparation towards the construction decision, to be ready for a new assessment by Council around 2010.
6. Studies of the scientific case for future neutrino facilities and the R&D into associated technologies are required to be in a position to define the optimal neutrino programme based on the information available in around 2012; Council will play an active role in promoting a coordinated European participation in a global neutrino programme.
7. A range of very important non-accelerator experiments take place at the overlap between particle and astroparticle physics exploring otherwise inaccessible phenomena; Council will seek to work with APFEL to develop a coordinated strategy in these areas of mutual interest.

8. Flavour physics and precision measurements at the high-luminosity frontier at lower energies complement our understanding of particle physics and allow for a more accurate interpretation of the results at the high-energy frontier; these should be led by national or regional collaborations, and the participation of European laboratories and institutes should be promoted.
9. A variety of important research lines are at the interface between particle and nuclear physics requiring dedicated experiments; Council will seek to work with NuPECC in areas of mutual interest, and maintain the capability to perform fixed target experiments at CERN.
10. European theoretical physics has played a crucial role in shaping and consolidating the Standard Model and in formulating possible scenarios for future discoveries. Strong theoretical research and close collaboration with experimentalists are essential to the advancement of particle physics and to take full advantage of experimental progress; the forthcoming LHC results will open new opportunities for theoretical developments, and create new needs for theoretical calculations, which should be widely supported.
14. Particle physicists in the non-Member States benefit from, and add to, the research programme funded by the CERN Member States; Council will establish how the non-Member States should be involved in defining the strategy.

Complementary issues

15. Fundamental physics impacts both scientific and philosophical thinking, influencing the way we perceive the universe and our role in it. It is an integral part of particle physics research to share the wonders of our discoveries with the public and the youth in particular. Outreach should be implemented with adequate resources from the start of any major project; Council will establish a network of closely cooperating professional communication officers from each Member state, which would incorporate existing activities, propose, implement and monitor a European particle physics communication and education strategy, and report on a regular basis to Council.
16. Technology developed for nuclear and particle physics research has made and is making a lasting impact on society in areas such as material sciences and biology (e.g. synchrotron radiation facilities), communication and information technology (e.g. the web and grid computing), health (e.g. the PET scanner and hadron therapy facilities); to further promote the impact of the spin-offs of particle physics research, the relevant technology transfer representatives at CERN and its Member States should create a technology transfer forum to analyse the keys to the success in technology transfer projects in general, make proposals for improving its effectiveness, promoting knowledge transfer through mobility of scientists and engineers between industry and research.
17. The technical advances necessary for particle physics both benefit from, and stimulate, the technological competences available in European industry; Council will consolidate and reinforce this connection, by ensuring that future engagements with industry takes account of current best practices, and continuously profits from the accumulated experience.
11. There is a fundamental need for an ongoing process to define and update the European strategy for particle physics; Council, under Article II-2(b) of the CERN Convention, shall assume this responsibility, acting as a council for European particle physics, holding a special session at least once each year for this purpose. Council will define and update the strategy based on proposals and observations from a dedicated scientific body that it shall establish for this purpose.
12. Future major facilities in Europe and elsewhere require collaborations on a global scale; Council, drawing on the European experience in the successful construction and operation of large-scale facilities, will prepare a framework for Europe to engage with the other regions of the world with the goal of optimising the particle physics output through the best shared use of resources while maintaining European capabilities.
13. Through its programmes, the European Union establishes in a broad sense the European Research Area with European particle physics having its own established structures and organisations; there is a need to strengthen this relationship for communicating issues related to the strategy.

Unanimously approved by the CERN Council at the special Session held in Lisbon on 14 July 2006