



ECFA and the European strategy discussion in 2012

International Workshop on Future Linear Colliders
26–30 September, Granada, Spain

- History of ECFA involvement in LC
- European HEP Structure
- European Strategy for the energy frontier with personal reflections
- Changing environment for the Linear Collider effort
- Uneducated personal exercises for “if” ...
- Timeline for the Strategy Update
- Summary

Tatsuya NAKADA, ECFA Chair and

Scientific Secretary for the Strategy Session of the CERN Council

Ecole Polytechnique Fédérale de Lausanne (EPFL)





- History of ECFA involvement in LC
 - Joint ECFA/DESY Study on Physics and Detectors for a Linear Electron-Positron Collider.
1996–1997 Chair: L. Mandelli, 1998–2002 Chair: D. Miller
 - The ECFA Study of Physics and Detectors for a Future Linear Collider,
2003–2005 Chair: D. Miller
 - ECFA Study of Physics and Detectors for the International Linear Collider,
2005–2010 Chair: F. Richard

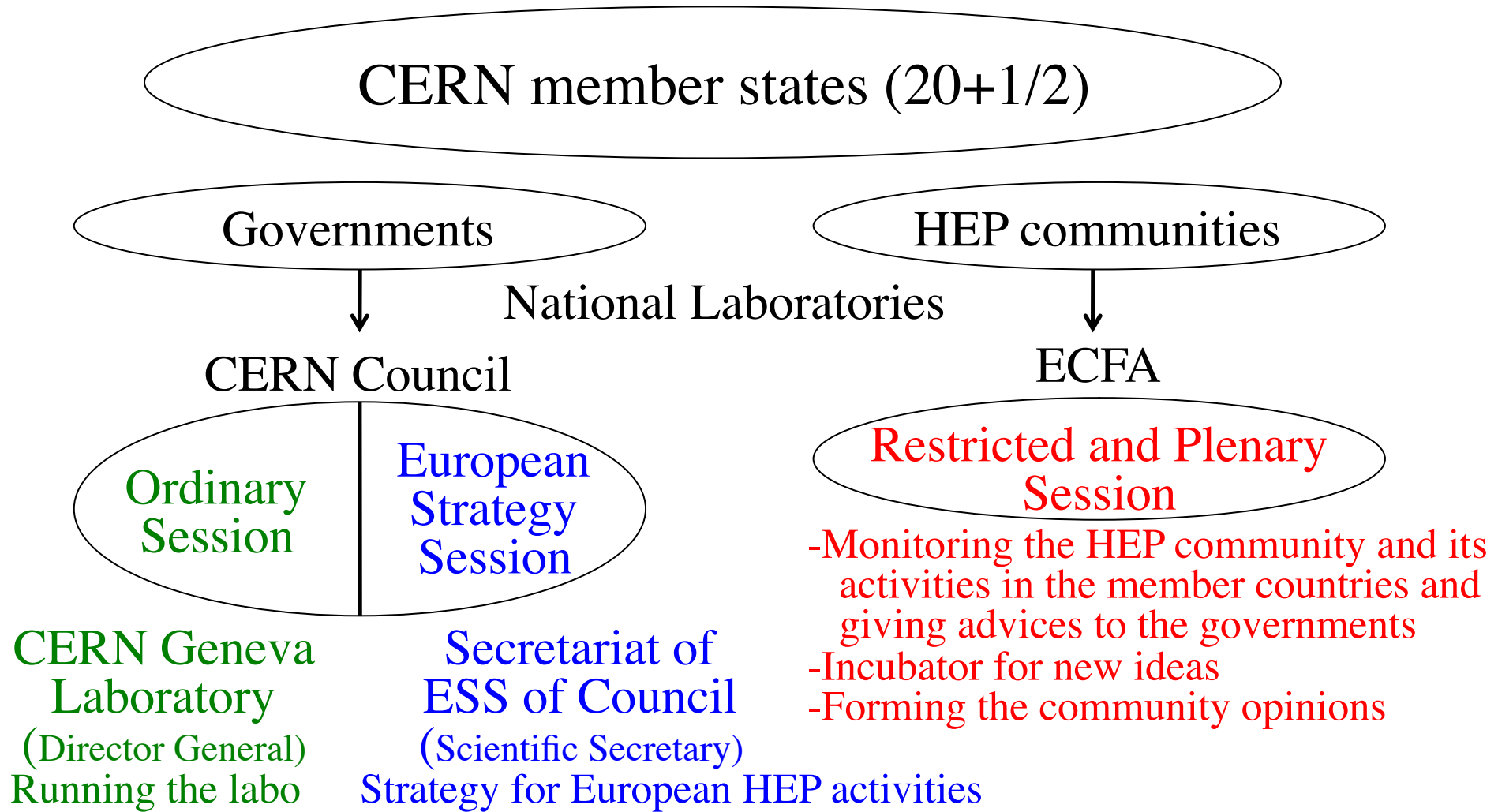


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- ECFA Study of Physics and Detector for a Linear Collider,
2011–2013 Chair: J. Fuster



• European HEP Structure





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CERN member states (20+1/2)

Governments

HEP communities

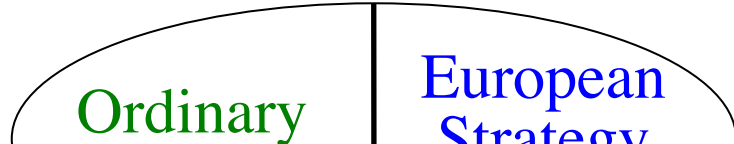


National Laboratories



CERN Council

ECFA



This is a part of the strategy, i.e. will be revisited by the update process

- Monitoring the HEP community and its activities in the member countries and giving advices to the governments
- Incubator for new ideas
- Forming the community opinions

(Director General)
Running the labo

(Scientific Secretary)
Strategy for European HEP activities





- **European Strategy for the energy frontier I**
 - The LHC will be the energy frontier machine for the foreseeable future, maintaining European leadership in the field;

A subsequent major luminosity upgrade (SLHC), motivated by physics results and operation experience, will be enabled by focussed R&D;



- European Strategy for the energy frontier I
 - 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 focussed R&D; *to this end, R&D for machine and detectors has to be vigorously pursued now and centrally organized towards a luminosity upgrade by around 2015.*



- Personal reflections

- LHC has been the priority project of the European Particle Physics
- Running at 1/2 of the energy is progressing well, Reaching the ~designed energy and ~luminosity will be ~2015.
- Exact definition of “major luminosity upgrade” is still fluid. Potential of LHC without major upgrade is still to be explored. The upgrade activities for the four large experiments are advancing: the first time slot for an upgrade in around 2018?



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- Good hope to settle the existence of the Standard Model (like) Higgs by the end of 2012.



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- European Strategy for the energy frontier II
 - 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 intensified, 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-intensity neutrino facility.*



- Personal reflection

- Although CERN plays a central role, the CLIC R&D is advancing by an international collaboration organised like a typical large HEP experiment.



- **European Strategy for the energy frontier III**
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- 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.*



- Personal reflections

- Work organised as a global effort with ICFA-ILCSC-GDE-Groups in the Three Regions framework. TDR work well advancing.
- Time for a new assessment by Council, i.e. updating the Strategy, has been delayed from 2010 to early of 2013 (see later).



- Changing environment for the Linear Collider effort
 - ILC-GDE mandate finishes with the completion of TDR in 2012: a new structure needed
 - CLIC submits its CDR in 2011-2012
 - Physics results from the LHC 2011-2012 run
 - Update of the European Strategy for Particle Physics in early 2013.



- For the strategy update, a common and coherent view from the Linear Collider community would be effective. Case studies for different LHC outcomes could be useful to build up such a view?

Here are my “very personal” and “uneducated” exercises...



- Many new particles below 1 TeV (with or without Higgs) seen by LHC: \Rightarrow Gather momentum to propose ILC construction. For Europe, CERN Council provided a framework (CERN/2898/Rev.)
 - 1) CERN is prepared to join partners in discussions about new governance structures for future global accelerator projects.
 - 2) In particular, CERN is prepared to provide an institutional framework within which a “Project Governing Board” could direct a global accelerator project.
 - 3) As a *prototype* implementation of such an institutional framework for a global accelerator project, CERN should *explore* a governance structure for future upgrades of the LHC.
 - 4) CERN is willing to consider hosting a future global accelerator project, if it is deemed to be in the interest of the Organization and the global particle physics community.
 - 5) In the case of a future global accelerator project hosted elsewhere, CERN is willing to coordinate broad European participation.



- No new particles nor Higgs seen by the LHC experiments \Rightarrow Wait for the results from the LHC 2015–2017 run @ $\sqrt{s} \approx 14$ TeV, but continue CLIC “R&D” and ILC “D”?
- How can one sustain LC effort in a productive manner?



- Only a low mass Higgs seen by LHC \Rightarrow Propose a Higgs factory(?)
 - Need to demonstrate convincing cases, with respect to the LHC experiments.
 - Is there convincing scientific case for the $t\text{-}\bar{t}$ threshold running?
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 By the way, evidence for New Physics may come first from flavour experiments....



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 - Preparatory and Strategy Group established
 - Kickoff meeting: ECFA-EPS session of Europhysics HEP Conference in Grenoble in July 2011
 - Preparatory Group started to work (Science input)



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 - Three-day Open Symposium for community input in September 2012
 - One-week Strategy Group meeting for drafting the updated Strategy in January 2013
 - CERN Council discussion in March 2013
 - Presentation at EU Council of Ministers in May (or June) 2013



- Summary

- As an incubator for new initiatives, ECFA has been supporting the Linear Collider activities
- In the current European Strategy, Linear Colliders have important positions.



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- As an incubator for new initiatives, ECFA has been supporting the Linear Collider activities
- In the current European Strategy, Linear Colliders have important positions.
- Linear Collider community needs to adapt for evolving environment in particle physics.
- For the strategy update, common and coherent inputs from the Linear Collider community would be highly valuable.