

# Towards a European strategy on particle physics

G. Wormser  
LAL Orsay



# Talk outline

- The process to define a European strategy on particle physics
- The Zeuthen meeting and documents
- The European priorities
- US-Europe relationship
- Personal proposal to start implementing a global model of collaboration
- Summary



# Europe political complexity

- More than 40 countries in Europe
- CERN member states : 20 countries
- European Union members states 25 soon 27 countries
- Where is Europe boundary in particle physics: Russia, Israel, Turkey?
- Two major labs CERN, DESY, one internationally driven, the other one nationally funded but open to international participation
- Several more accelerator centers nationally funded: Frascati, PSI, RAL/Daresbury
- APpEC (club of funding agencies) recently created to coordinate European astroparticle physics



# The European Union tools and councils

- Multiyear R&D framework plans 6th PCRD, 7th PCRD 2007-2013
- The ESFRI board and roadmap
- The European Research Council
- New tools in the 7th PCRD NCI: New Construction Initiatives. Call launched early 07, 600 M€, the initiative has to be in the ESFRI roadmap
- Official delegation of ESFRI to CERN Council process for HEP related matters.
- Important EU contribution to HEP european programs since 6th PCRD, especially in accelerator R&D (CARE, EUROTEV, EUROFEL, EUDET, EURISOL, EUROTRANS) (~100 M€) and Grids (DATAGRID, EGEE, EGEE-II) (82 M€)
- Strong expectation in the 7th PCRD, especially for a large SupraConductivity RF facility, to be based at CERN.



# The CERN Council strategy process

- All details can be found at:
- <http://council-strategygroup.web.cern.ch/council-strategygroup/>
- Started in September 2005 under the aegis of section 2b of the CERN convention
- Three phases
  - Community input : the Orsay symposium January 2006
  - Strategy group workshop : Zeuthen meeting May 2006

CERN council approval : Lisbon, July 14, 2006



# CERN convention

- .1. The Organization shall provide for collaboration among European States in nuclear research of a pure scientific and fundamental character, and in research essentially related thereto. The Organization shall have no concern with work for military requirements and the results of its experimental and theoretical work shall be published or otherwise made generally available.
- 2. The Organization shall, in the collaboration referred to in paragraph 1 above, confine its activities to the following:
  - (a) the construction and operation of one or more international laboratories (hereinafter referred to as "the Laboratories ") for research on high-energy particles, including work in the field of cosmic rays; each Laboratory shall include:
    - (i) one or more particle accelerators;
    - (ii) the necessary ancillary apparatus for use in the research programmes carried out by means of the machines referred to in (i) above;
    - (iii) the necessary buildings to contain the equipment referred to in (i) and (ii) above and for the administration of the Organization and the fulfilment of its other functions;
  - (b) the organization and sponsoring of international co-operation in nuclear research, including co-operation outside the Laboratories; this co-operation may include in particular:
    - (i) work in the field of theoretical nuclear physics;
    - (ii) the promotion of contacts between, and the interchange of, scientists, the dissemination of information, and the provision of advanced training for research workers;
    - (iii) collaborating with and advising other research institutions;
    - (iv) work in the field of cosmic rays.



# The actors of the Strategy process

- CERN council : Government representatives of member states(for large countries, one scientific and one political delegate) (works with one vote per country)
- Observer status granted to :
  - Turkey, Israel , Russia, EU, UNESCO
  - USA, Japan, India (given for LHC contributions)
- The strategy group :
  - Chairs: Ken Peach (SPC chair), Torsten Akesson (ECFA chair)
  - Preparatory group : Chairs +8 « ad personem » members picked up for R-ECFA and SPC
  - Directors of 8 large european laboratories : CERN, DESY, RAL, PSI, LNF Frascati, LN Gran Sasso, LAL Orsay, DAPNIA Saclay
  - 20 persons designated by the 20 member states
  - Usually the CERN council (scientific) delegate
  - Invited members from the observer states (with an observer status)



# The Orsay symposium

- Organised by LAL Orsay January 30-February 1, 2006
- Very strong participation of the European community: >400 present + 400 connected by video at one time or another (80 peak)
- <http://events.lal.in2p3.fr/conferences/Symposium06/>
- Presentations and discussions were summarized in a « briefing book » given to Zeuthen workshop participants



# The Zeuthen workshop

- One main deliverable: a two-page bulleted strategy document, to be submitted to the special session of CERN Council (Lisbon July 14) for unanimous approval
- This document had therefore to be unanimously approved at Zeuthen!
- A second deliverable ; a 20 page document backing this strategy document
- Organized around many working groups (membership chosen by preparatory group)
- Success can be declared: a non empty document was indeed unanimously approved. Important not to underestimate this achievement!



# The Draft Strategy Document

- Contains 17 statements
  - 2 general issues
    - European role and structure in HEP
    - Need for an European strategy
  - 8 scientific activities
    - Not very different from EPP2010
    - Mentions links with nuclear physics and theoretical physics
  - 4 organizational issues
    - How to pursue the strategy process
    - Global scale collaboration
    - Relationship with EU
    - Relationship with non member states
  - 3 complementary issues
    - Outreach, technology transfer to other scientific fields, industry



# Reminder: the EPP2010 priorities

- Fully exploit the LHC
- Major program of R&D design, industrialization, management and financing studies of the ILC accelerator and detectors; Intent to host; make a compelling bid
- Stronger emphasis on the interface of particle physics, astrophysics and cosmology
- Develop a strong and well coordinated neutrino program with international planning and cooperation
- Best possible efforts on small and large scale precision experiments



# The dual role of CERN council

- One key aspect of the European strategy process is the ability of CERN council to work in a dual way
  - (a) Taking care of the CERN laboratory in Geneva when meeting there
  - (b) Taking care of European strategy as a whole when meeting abroad
- Note again that CERN Council is direct representation of European governments
- An important point is the connection between the two functions:
  - Will approved (in mode (b)) strategic decisions implying increased CERN budget be followed by the vote of a budget increase in mode (a)
  - First example coming very soon: DSD document stresses the need for extra R&D effort
- Who will represent Europe in a global collaboration mode
  - First example : Europe presentation in FALC
- Will CERN council manage European contribution (financial and/or technical) to a global machine channeled thru CERN organization



# Europe/US relationship

- Difficult transition from a world of competition to a world of global cooperation
- Very important to realize that today, some feelings of mistrust exist on both sides!
- From Europe:
  - Widespread feeling (also shared by some in the US!) that the overall scenario of US participation in the LHC is a very good deal for US
    - Does not necessarily imply that past agreements must be renegotiated
  - How compelling a compelling US ILC bid can really be?
  - How to guarantee that the next large machine in Europe will be more globally financed than the LHC has been
- From the US
  - Why accusing US who is respecting signed agreements?
  - Can Europe make decisions thru CERN council requiring unanimous approval, especillay with the large weight of the « small countries »
  - Can the decoupling between the two roles of the CERN council be strong enough to let Europe invest in something large not in Geneva.
  - US is opening widely its various councils to European participation. Why Europe is not doing the same?



# A personal model to « break the ice »

- This was (rather intensely) discussed at Zeuthen but it represents here only my personal views
- Use the LHC upgrade program as a short-term moderate cost first example of a future global machine
  - LHC upgrade is key part of both Europe and US strategies
  - Treating LHC upgrade in a global mode allows to exercise the model when costs scale is « moderate » (200-400 MCHF)
  - It will soothe the LHC US contribution « problem » (viewed from Europe) while preserving ICFA rules for free usage of beams
  - It will encourage Europe to invest massively in a non European machine, not having to wait 20 years to see if the reciprocity can be reached.
  - Rather in line with new FALC role



# European contributions to a world wide project abroad

- Again, intensively discussed in Zeuthen but my personal views expressed here
- Many european countries including some of the « small countries », want to participate to the ILC
- This can only be achieved « thru CERN », ie meaning thru their contribution to the CERN budget
- From ~2012 onwards, IF the CERN budget is kept at the present level, ~300 MCHF per year would become available for new projects. Could be split in three parts:
  - LHC upgrades
  - Extensive R&D for the next large scale accelerator in Europe
  - « Centralized » participation to a world wide machine not based in Europe (ECP)
- European participation to the world wide machine would be supplemented by direct participation of european countries on a voluntary basis. (Could still transit thru CERN if desired) (EVP)
- Practical example: assuming  $ECP=100$  MCHF/y over 10 y and  $EVP=ECP$ , Europe could contribute 2 GCHF to a non european based ILC (rather optimistic scenario but maybe not totally crazy)



# Summary

- European strategy process nearing completion! Given Europe political complexity, this is a real achievement that should not be underestimated!
- Very important to always distinguish from now on CERN Council with its new dual role and CERN laboratory.
- US and Europe scientific priorities reasonably well aligned: an historic opportunity to strengthen international collaboration
- Some level of mistrust exists today. Using the LHC upgrade program to dissipate it and accelerate the transition towards the new way of global collaboration needed for ILC may be worth exploring.

