

# Theoretical Physics

## Summary of discussion

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- Purpose of the Open Symposium exercise w.r.t. Theoretical Physics
- Quality assessment indicators
- Critical mass of theory groups
- Relations between theorists and experimentalists
- Lattice field theory
- Relations with the E.U.

# Main purpose

- Identify possible problems/issues calling for action at the european level
- Identify and promote good practice models which could help the progress of theoretical physics in europe

The comparison with US and RoW, and within Europe, was intended to stimulate discussion in view of the above goals

Further input welcome until Mar 15 !!

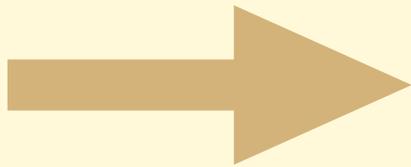
# Role of citations/impact factors

- In this context, goal was to provoke discussion
- General agreement that citations provide an incomplete and sometimes biased picture
- The need for objective impact and quality indicators remains
- Make sure the subfields where the accumulation of citations follow different patterns are properly compared. E.g. time-consuming higher-order calculations
- Introduce new tools? Google?

# Critical mass of theory groups

clear advantage, but not indispensable for good research

The critical mass can be achieved by different means, not necessarily concentrating all theorists in a limited number of excellence centres.



Exploit other means to bring together theorists, such as Workshops, Summer Institutes, **visitor programmes** at large centres.

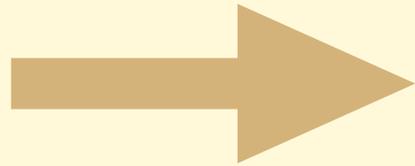
For example:

- add more focus to the TH visitor programme
- extend programmes like the G.Galilei Institute
- enable smaller centres to run Workshops, etc.

Critical mass in smaller Institutions is however crucial to provide active environment to Postdocs and, especially, students

# Relations between TH and EXP

1 CERN/DESY vs IPPP models:  
both successful



both share the ability to bring together  
theorists and experimentalists

However, the daily exposure of theorists to experimentalist, and viceversa, possible at the labs and at many Universities, is invaluable

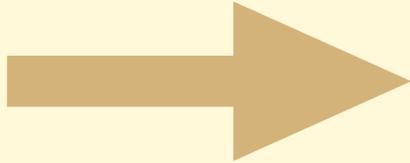
2 Students: seeds for the future progress of our field

- strongly encourage contacts between exp and th students
- train the former to understand the latter, and viceversa

# Relations between TH and EXP at the LHC

1

Time of back-of-the-envelope calculations is over! The LHC requires theorists to familiarize themselves with the necessary tools



**training of the students essential !!**

- role of Universities and advisors -- allow more flexibility in the curriculum and scientific profile of a student and postdoc
- create occasions for TH students and EXP students to establish close contacts and learn from each other

2

**Protocols of collaboration** between experiments and theorists? I personally believe that common sense is a more powerful tool ....

# Lattice field theory

1

Theoretical developments, leading to improved algorithms, crucial to fully benefit from the enhanced CPU power

2

Further progress essentially complements the ambitious future experimental programmes, e.g. super-B factories: the potential outcome of these experiments should not be limited by insufficient funding of lattice research

# Relations with E.U.

1

More flexibility required in the use of Network resources

2

Particle physics recognized as a subfield of physics in the calls for proposals

3

Support international theory collaborations directly from PP funding agencies?

4

Maintain room for creativity, do not confine all theoretical activities within the boundaries of **project oriented** programmes