

# “Open Discussion Session”

- ▶ Surprising (in a positive way) level of discussion in Granada on:
  - ▶ How to organise R&D and how to make choices
  - ▶ Relationship with the ‘global programme’
  - ▶ Broadness vs depth
  - ▶ ‘Value for money’ and comparisons
  - ▶ Money and aspirations
  - ▶ CERN’s non-accelerator programme
  - ▶ Careers and skills
  - ▶ How to maintain ‘vibrance’
  - ▶ Computing, in the medium and long term
  - ▶ Accelerator R&D
- ▶ These discussions were not always ‘open’...
- ▶ These are clearly **strategic points**
  - ▶ Just as important than “which machine is next?”
    - ▶ *Dopke: “Everyone here might be dead by the time the new physics comes”*
  - ▶ We should pay more than lip service to these issues in the Strategy

# Gleaned from Group Inputs

## ▶ R&D programme

- ▶ AIDA and RDx have in the past worked well
- ▶ The 'new' CERN R&D programme is very CERN-centric
  - ▶ Still duplication, lack of coordination, across European activities
- ▶ **Consensus**: as R&D costs and timescales increase, coordination essential

## ▶ Global programme

- ▶ **Consensus**: given the situation, Strategy has to be at least partially responsive to external decisions
  - ▶ The 'best' machine for physics is by definition the one that finally gets built
- ▶ We and CERN need to be aware; responsive; supportive (if and when)
- ▶ Are our global investments matched by counter-investment into Europe?

## ▶ Broadness vs depth

- ▶ **Consensus**: broadening is an important aspect in medium term
- ▶ **No consensus**: what broadening actually means (defined as 'my project')
  - ▶ And how to judge between competing visions for medium-scale activities

# Gleaned from Group Inputs

- ▶ What is 'value for money'?
  - ▶ Perhaps the most interesting topic, only tangentially 'strategic'
    - ▶ I refer you to <https://arxiv.org/abs/1904.02769>
    - ▶ 'The best' is not always 'the most cost effective'
    - ▶ How many points for 'cheap' experiments looking in unlikely places
  - ▶ **My take:** There is no affordable means of 'covering all bases'. Live with it.
    - ▶ Significant lack of realism on affordability at several points in Granada
- ▶ Money and aspiration
  - ▶ **Consensus:** money *and people* are finite resources
    - ▶ No strategy, however scientifically excellent, can be made whilst ignoring this
  - ▶ **Consensus:** uncontrolled public 'announcements' of cost are dangerous
    - ▶ My take: c.f. FCC costing exercise at CERN vs ILC international process
  - ▶ We need to be very careful when comparing costs, merit and time scales
    - ▶ Comparisons with non-HEP major projects are very tricky – avoid
- ▶ CERN's non-accelerator (non-PP) programme
  - ▶ e.g. direct involvement in major particle-astrophysics projects
  - ▶ **Consensus:** the science is great, but this is 'not what CERN is for'
  - ▶ **Consensus:** better coordination with APPEC planning is essential

# Gleaned from Group Inputs

## ▶ Careers / skills

- ▶ **Consensus:** the 'built in bias' in career opportunities is unhelpful to the field
  - ▶ Especially for instrumentation and computing specialists
  - ▶ **My take:** there are very few generalists left; this is very dangerous situation
- ▶ The Oide Principle also applies to detector builders
- ▶ Clearly a strategic issue, but **what is it useful to express** in the Strategy?
  - ▶ The culture of hiring practices is a global phenomenon

## ▶ How to maintain 'vibrance' in our field

- ▶ **Consensus:** HL-LHC will be very challenging, should not omit to re-emphasise this
  - ▶ Failure to complete LHC programme on time and budget will kill future things
- ▶ Some sociological challenges coming up for our field
  - ▶ How can we balance the needs of LHC against other physics opportunities?
  - ▶ How do we cope with 'no new physics' for the foreseeable future?
  - ▶ How do we cope with ever-extending timescales (the 'cathedral syndrome')?

## ▶ Computing

- ▶ **Consensus:** no obvious or easy solutions to the costs of computing
  - ▶ **No consensus:** what to actually do about this
- ▶ **My take:** this is a 'strategic', but possibly LHC-centric issue
- ▶ **My take:** appeal to magic (ML, QC) is definite not an answer

# Gleaned from Group Inputs

- ▶ Accelerator R&D
  - ▶ **Consensus**: we need a significant focus on R&D, noting that this competes with plans to build 'easy' machines
  - ▶ **No consensus**: what this R&D should focus on
    - ▶ Tortoise and hare (e.g. wakefield vs muons vs high field magnets)
- ▶ **My favourite statement** (Made by several people at several times)
  - ▶ "Doing the same thing again only bigger *must eventually approach the end of its plausible lifetime*"
  - ▶ This applies to many other considerations than accelerator technology
- ▶ Summary
  - ▶ **Consensus**: there are a lot of issues outside straight investment decisions that can and will affect the way we do business
  - ▶ **Consensus (?)**: many of these matters concern meta-strategy
    - ▶ A strategy for how we make future strategy
  - ▶ **My take**: a lot is going to happen in the next five years. Should we be thinking of a more frequent / lightweight / parallel process?
- ▶ Other important topics in play (not so widely covered at Granada, but...)
  - ▶ Theory support / connection; impact; diversity; **environmental cost**