# IPPP report and European Strategy Update

Keith Ellis
IPPP

# IPPP Associateships 2017-2018

**Bezrukov**
Minimal Models for Cosmology and Particle Physics

**De Santo**
Synergies and Complementarity between the High-Luminosity LHC and Future Colliders

**Englert**
Phenomenological aspects of LHC physics and model-building

**Issever,**
Prospects for the Higgs self-coupling measurement at the LHC

**Rademacker,**
Multibody decays of Heavy Flavour as a precision tool to characterise physics beyond the SM

**Nikolopoulos,**
Direct searches for light Dark Matter

**O'Connell,**
Twistors and Higher Dimensions.

**Rizvi,**
Electroweak Precision Observables at the LHC

**Applications for 2018-2019 due 31/8/2018**

# IPPP Senior Experimental Fellowships

Dan Watts Ken Long

Bridging the gap between neutrino-nucleus and electro-nucleus scattering

Tim Gershon

Towards the ultimate precision in flavour physics

Applications for 2018-2019 due 31/8/2018

# Upcoming IPPP workshops

- YETI 2018, “LHC Firsts”, 7-10 January 2018 (Cerdeno).
- Higgs+dijets,  10-12 January 2018 (Andersen).
- Higgs-Maxwell Meeting (in association with Edinburgh, Glasgow & Lancaster) 14 February 2018 (Edinburgh).
- UK Input to the European Particle Physics Strategy Update, 16-18 April 2018 (Spannowsky et al).
- MC4BSM, 18-20 April 2018 (Krauss).

# DIVA program

New

- Durham IPPP Visiting Academics — DIVA
- Funded by STFC in IPPP grant 2018-2020, and thereafter subject to success/funding.
- https://www.ippp.dur.ac.uk/diva

- Up to six bursaries are available each year with a value of £5000 each.
- The intention of the bursaries is to bring distinguished researchers from outside the United Kingdom for the period of at least three weeks.
- Decisions on bursaries will be made by the IPPP Steering Committee, which meets twice a year, in March and in September.
- To be considered at the March or September meeting, applications must be received before the 28/2 or 31/8 respectively.
- Applications can be sponsored by any permanent member of staff at a UK University with a particle physics programme.
- Applications should be sent to keith.ellis@durham.ac.uk and linda.wilkinson@durham.ac.uk
- Preference will be given to visits that have the potential to create new collaborations, rather than maintain existing relationships.
- Proposed research topics should influence, or have the potential to influence the UK experimental program.
- There is no application form, but hosts should submit the name and institute of proposed visitor, the proposed length and time period of the visit, and the proposed topic.
- DIVA winners will be expected to give a seminar or colloquium at both the host institution, and at the IPPP.
- Applications longer than one page of A4 will not be accepted.

# European Strategy Update

- Next update of the European Strategy for Particle Physics.
- Aim to have update of Strategy for May 2020.
    - 7 years since the last update, 2013.
    - End of Run 2 of LHC (12/2018)
    - FCC conceptual design report completed
    - CLIC update
    - Report of Physics beyond Colliders Study Group by end of 2018
    - Japanese decision on ILC should be known by end of 2018.

# Current European Strategy(2013)

a) Europe should preserve this model (i.e. CERN) in order to keep its leading role, sustaining the success of particle physics and the benefits it brings to the wider society.

b) The European Strategy takes into account the worldwide particle physics landscape and developments in related fields and should continue to do so.

c) Europe's top priority should be the exploitation of the full potential of the LHC, including the high-luminosity upgrade of the machine and detectors with a view to collecting ten times more data than in the initial design, by around 2030. This upgrade programme will also provide further exciting opportunities for the study of flavour physics and the quark-gluon plasma.

d) CERN should undertake design studies for accelerator projects in a global context, with emphasis on proton-proton and electron positron high-energy frontier machines. These design studies should be coupled to a vigorous  accelerator R&D programme, including high-field magnets and high-gradient accelerating structures, in collaboration with national institutes, laboratories and universities worldwide.

e) Europe looks forward to a proposal from Japan to discuss a possible participation, (in ILC)

f) CERN should develop a neutrino programme to pave the way for a substantial European role in future long-baseline experiments. Europe should explore the possibility of major participation in leading long-baseline neutrino projects in the US and Japan.

h) Europe should support a diverse, vibrant theoretical physics programme, ranging from abstract to applied topics, in close collaboration with experiments and extending to neighbouring fields such as astroparticle physics and cosmology. Such support should extend also to high-performance computing and software development.

i) Detector R&D programmes should be supported strongly at CERN, national institutes, laboratories and universities. Infrastructure and engineering capabilities for the R&D programme and construction of large detectors, as well as infrastructures for data analysis, data preservation and distributed data-intensive computing should be maintained and further developed.

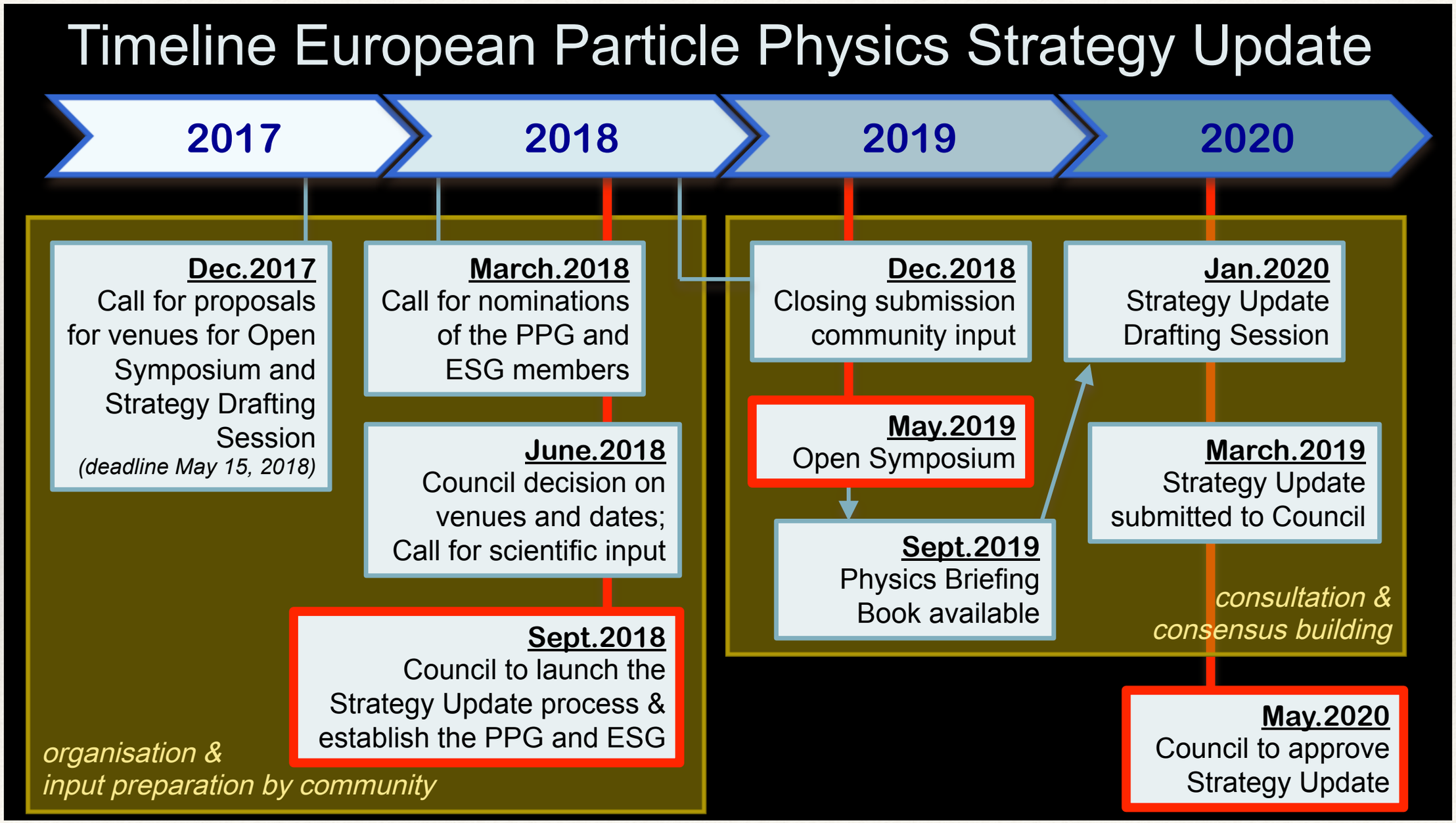
j) A range of important non-accelerator experiments take place at the overlap of particle and astroparticle physics, such as searches for proton decay, neutrinoless double beta decay and dark matter, and the study of high-energy cosmic-rays. These experiments address fundamental questions beyond the Standard Model of particle physics. The exchange of information between CERN and ApPEC (Astroparticle Physics European Consortium) has progressed since 2006. In the coming years, CERN should seek a closer collaboration with ApPEC on detector R&D with a view to maintaining the community's capability for unique projects in this field.

k) A variety of research lines at the boundary between particle and nuclear physics require dedicated experiments. The CERN Laboratory should maintain its capability to perform unique experiments. CERN should continue to work with NuPECC on topics of mutual interest.

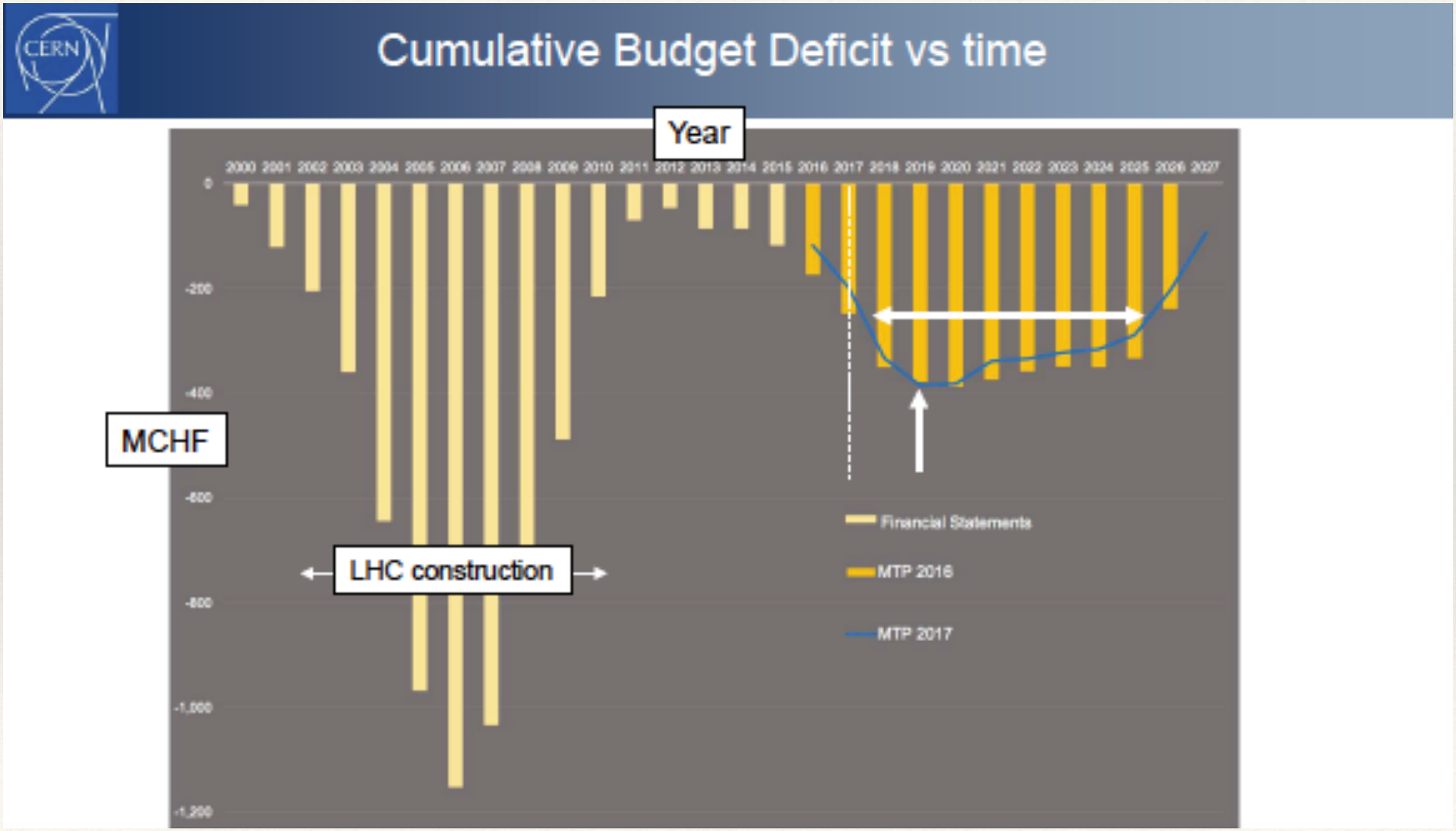
# Last strategy process led to initiation of CERN/European activity in neutrino physics

Prototype cryostats for liquid Argon detectors at CERN

# Countdown to May 2020



# Timeline for Money



# Strategy process 2018 to early 2019

- The input is collected by the Physics Preparatory Group, (PPG)
- The PPG organizes the Open Symposium to discuss the proposals.
- The drafting is based on input from the community-collaborations, proposals, national institutes, national roadmaps, individuals.
- The PPG summarizes the input, the discussion and the conclusions in a Briefing book.
- The briefing book constitutes the input for the European Strategy Group(ESG)  to draft the update.
- The drafting of the strategy takes place during a dedicated Draft Session (the conclave the EPPSU process)
- The whole organization is run by the strategy secretariat.
- The strategy update is drafted by the  European Strategy Group (ESG).
- All teams are chaired by the Strategy Secretary.

# Strategy Secretariat

Strategy Secretary
Halina Abramowicz (Israel)

ECFA chair
Jorgen D'Hondt(BE)

Laboratory Directors' Group
Leonid Rivkin (CH)

Scientific Policy Committee
Keith Ellis (UK)

# Composition of PPG(15-17 people)

The Strategy Secretary (chair)
- Four members recommended by the SPC
- Four members recommended by ECFA
- SPC chair
- ECFA chair
- Chair of the the European Laboratory Directors Group
- One representative appointed by CERN
- Representative(s) from Asia (≤2)
- Representative(s) from the Americas (≤2)

# Composition of the ESG(62-64 people)

Members
- The Strategy Secretary (chair)
- One representative appointed by each CERN MS (22)
- One representative appointed by each of the Labs participating in the European Laboratory Directors Group including its Chairperson (9)
- CERN DG
- SPC chair
- ECFA chair

Invitees
- President of CERN Council
- One representative from each AMS and OS (7+3)
- One representative from the European Commission
- Chairs of ApPEC, NuPECC, FALC, ESFRI
- Members of the PPG (17 - Secretariat)

# Update of strategy process 2018-May 2020

- 2018 to early 2019 is a year of preparation, and for generation of ideas.
- “Letting a hundred flowers blossom and a hundred schools of thought contend is the policy for promoting progress in the arts and the sciences”…
- 2019-2020 is to do with fiscal reality, hammering out consensus, uniting the community with common goals.

# Start of UK strategy effort

- We have identified about 50 names from around the UK, nominated by their Universities.
- Four people have been chosen to stimulate a set of workshops, the first to be held 16-18 April 2018 at the IPPP, "UK inputs to European Particle Physics Strategy Update", http://conference.ippp.dur.ac.uk/event/661/
- Sinead Farrington(Warwick), Evgueni Goudzovski (Birmingham), Mitesh Patel(Imperial), Michael Spannowsky(IPPP) are the main contact persons.
- All 50 names will all be invited to the workshop, (as well as other interested parties - subject only to space limitations).
- Registration will commence in mid-January.