

European Strategy

2013: “Other scientific activities essential to the particle physics programme”

“Experiments studying quark flavour physics, **investigating dipole moments, searching for charged-lepton flavour violation and performing other precision measurements at lower energies, such as those with neutrons, muons and antiprotons**, may give access to higher energy scales than direct particle production or put fundamental symmetries to the test. They can be based in national laboratories, with a moderate cost and smaller collaborations. *Experiments in Europe with unique reach should be supported, as well as participation in experiments in other regions of the world.*”

Input being sought by Dec-18 2018 for the release of a new strategy in May 2020.

- this is a 10 page-limit submission and guidelines released last week.

Europe has an approved CLFV data taking programme through to O(2022)

MEG-II (80 people) : 6×10^{-14} after 3 years : so finish data taking 2021/22.

Mu3e (60 people) : first data in 2020 @ $10^8 \mu/s$ to get to 2×10^{-15} within 2 years so also 2021/22

Phase-II requires $2 \times 10^9 \mu/s$ to get to 1×10^{-16} not yet approved.

The Big Question and one we hope to get clarity on for the timescale of the Dec Submission is would the MEG-II, Mu3e (and COMET-II) be interested in exploiting PIP-II.

Is there e.g. a possibility of having all 3 CLFV variants @ FNAL ?

IV Muon Experiments with *Project X*

*Robert Bernstein, Graham Kribs,
Vincenzo Cirigliano, André de Gouvêa, Douglas Glenzinski, Brendan Kiburg,
Kyle Knoepfel, Nikolai V. Mokhov, Vitaly S. Pronskikh, and Robert S. Tschirhart*

arXiv:1306.5009

Other things happening in Europe: “Physics Beyond Colliders” initiative
Gaining traction. Big meeting Nov 2017 with another one this November.

Of things discussed:

pEDM : O(1 GeV) proton ring (COSY starting)

MuonE : spacelike $\mu e \rightarrow \mu e$ (150 GeV muon) for g-2 HVP (but before 2026)

LDMX : also possible with muon beam

... and ShiP, NA62+, KLEVER, REDTOP, NA64, NUSTORM, IAXO, LUXE, γ -factory

Guidelines for submitting input for the 2020 update of the European Strategy for Particle Physics

Cover page (1 page)

Each document submitted should carry a single cover page containing no more than the title, the contact person(s) and an abstract.

Comprehensive overview (maximum 10 pages)

This core part of the document must be no more than 10 pages long (excluding the cover page) and must provide a comprehensive and self-contained overview of the proposed input. It should address:

- scientific context,
- objectives,
- methodology,
- readiness and expected challenges.

Addendum

A separate addendum is to be provided addressing the following topics (where relevant):

- interested community,
- timeline,
- construction and operational costs (if applicable),
- computing requirements.

Format and deadline for submission

The cover page and the comprehensive overview are to be submitted as a single file, the "main document", in portable document format (pdf) by 18 December 2018. The addendum is to be submitted as a separate file by the same deadline. A dedicated submission portal will be available on the EPPSU website as of October 2018, once the Strategy update has been formally launched by the Council at its September 2018 Session. The link to the EPPSU website will appear on the CERN Council's web pages - <https://council.web.cern.ch/en> - and be widely communicated through the appropriate channels.

Distribution

Both documents submitted (main and addendum) will be passed on to the Physics Preparatory Group (PPG) and the European Strategy Group (ESG). Unless explicitly requested otherwise, they will also be made public. The option not to make either document public will be available upon submission via the dedicated portal.