Goals of this edition of Muon4Future

Muon4Future2025

Setting the scene, very short summary of L. Sestini talk

- High intensity muon beams provide a powerful tool for conducting fundamental physics measurements, including g-2, charge lepton flavor violation, dipole moments, dark matter searches, …

- Several laboratories have already developed high-intensity muon beams with further improvements underway.

- At the same time, theoretical calculations are advancing in precision, offering increasingly accurate model predictions to be compared with experimental data.

Setting the scene, very short summary from L. Sestini talk (2)

- The High Energy Physics community, since a while, is discussing and investigating the possibility to have high intensity and high intensity-high energy muon beams.
- Recommendations from ESPPU20, as well as 2023 Snowmass and P5 have provided new momentum to pursue dedicated R&D efforts aimed at studying, designing, and prototyping high intensity-high energy muon beams.
- As a result:
  - Studies, design work, and initial R&D have been carried out on technologies for producing, cooling, and accelerating muon beams.
  - Detector technologies capable of operating in high-energy muon collision environments have been evaluated.
  - Theoretical understanding of high-energy muon collisions has reached a high level of maturity

These technologies could be a game changer for the future of collider-based physics.

This workshop aims to foster the formation of a community dedicated to supporting both the R&D efforts and the physics measurements that can be carried out at every stage of the facility's development.

During the workshop there will be presentations and discussions to:

- Strengthen comparisons between recent results from muon-based experiments and predictions of the Standard Model, refining theoretical and experimental consistency checks.
- Continue the assessment and development of muon beam technologies essential for next-generation experiments, including a review of current R&D efforts and planned upgrades for future proposals.
- Identify and prioritize the most promising physics opportunities, from precision measurements to exploratory searches, that can further test the Standard Model and probe potential new physics, while actively addressing innovative concepts, open challenges, and technical requirements.

We want something more

1. Support our activities to ensure the continuation of our experiments and the R&D on enabling technologies.
2. Support by the ESPPU25, while we understand that these will not be the highest priorities in Europe.

How to obtain that

1. Build a community that can collaborate on theory development, R&D and experimental efforts. Workshops like this can serve as starting point. We could consider creating a dedicated forum to share information, foster discussion, and request support when needed.
   Other ideas? Let's explore together how we can strengthen and grow this community.

How to obtain that - cont'd

2. We propose drafting a short document summarizing the outcome of the workshop, major findings and the the request for support. This document could be published on arXiv and shared with the ESPPU25 management team.

   A google doc document is open where we can collect findings, comments, suggestions and requests that can be the basis of the document.
   https://docs.google.com/document/d/1vI3u4O0_cLIavLCFpfZuP--r97V8RvJMDnNO43sGzeI/edit?usp=sharing

Have nice workshop and enjoy Venice