

Séminaire LAL

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Perspectives on the route to a multi-TeV muon collider

Muon beams of low emittance have the potential to take the search for new phenomena beyond the reach of the LHC and its upgrades and also the e^+e^- colliders that are under consideration today. Further, stored muon beams have been proposed as the source of intense, uniquely-well characterised neutrino beams. To harness the discovery potential of stored muon beams requires an R&D programme that addresses systematically each of the technological issues that are raised by the implementation of such a facility. Recent progress (the demonstration of muon ionization cooling by the MICE collaboration and the development of a concept for a novel high-energy muon source, LEMMA) gives new impetus to the discussion of the exciting programme of discovery that could be provided by the incremental development of a multi-TeV muon collider.

I will review the discovery potential of intense, high-brightness stored muon beams and discuss the status of the conceptual designs for the muon collider and neutrino factory. I will summarise the status of the R&D that has been performed on the key technological challenges, highlighting the recent measurement of ionization cooling, and outline the challenges that still need to be addressed. I will then present the Neutrinos from Stored Muons (nuSTORM) facility that is being developed in the context of the CERN Physics Beyond Colliders study group. nuSTORM gives us the opportunity to develop the techniques required to embark on the muon-collider journey while making precise cross section measurements that are required for the next generation of long- and short-baseline neutrino-oscillation experiments to reach their full potential.

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Organisation :

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