

Cooling Demonstrator Program for the Muon Collider

Monday 27 October 2025 11:15 (30 minutes)

A multi-TeV Muon Collider (MuC) has the unique potential to provide both precision measurements and the highest energy reach in one machine that cannot be paralleled by any currently available technology. One of the key challenges in development of the MuC is delivery of a high brightness muon beam, which is essential to produce sufficient luminosity. Ionization cooling, is currently the only feasible option for cooling a muon beam. Although MICE proved the physics principles of ionization cooling, the challenges associated with the cooling technology and its integration remain the bottleneck for a MuC. To understand and mitigate these risks, a Demonstrator facility that contains a sequence of ionization cooling cells that closely resemble a realistic ionization cooling channel is required. Such a facility will not only allow the design of each component of a cooling cell but will also allow the integrated performance of these to be tested to demonstrate that there are no showstoppers for such systems. In this talk I will review the progress on design of the muon cooling Demonstrator. Then I will discuss potential host sites and associated timelines within which the Demonstrator could be deployed. Finally, I will identify associated science programs that could be synergistic with the development, construction and operation of the Demonstrator.

Footnotes

Funding Agency

I have read and accept the Privacy Policy Statement

Yes

Author: STRATAKIS, Diktys (Fermi National Accelerator Laboratory)

Presenter: STRATAKIS, Diktys (Fermi National Accelerator Laboratory)

Session Classification: Facilities and Programs Session II

Track Classification: COOL'25