

**Muon Accelerators and Results from the MICE Experiment**

**Professor Daniel M. Kaplan**  
Illinois Institute of Technology

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To date most accelerators have used beams of stable particles: electrons, positrons, protons, or ions. High-brightness muon beams could facilitate the study of lepton–antilepton collisions at extremely high energies and provide well characterized neutrino beams. Such muon beams could be realized using ionization cooling, proposed some 50 years ago to increase muon-beam brightness. Ionization cooling of muons has now been demonstrated by the MICE experiment. Passage of the MICE muon beam through an energy-absorbing medium was observed to move muons from the tail of the beam into the core, increasing its phase-space density. The consistency of the measured results with the simulated performance of the apparatus validates designs of ionization cooling channels in which the cooling process is iterated to produce a substantial cooling effect. These results are an important step towards a possible future muon collider to search for phenomena at energy scales beyond the reach of the Large Hadron Collider at a facility of equivalent or reduced footprint.

**Wilson Hall, One West**