

## **Muon Colliders and Their Magnet Technology Needs**

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**Abstract—** Muon Collider magnet technology was summarized from the viewpoint of six categories. 1) Capture Solenoid for Simultaneous mu+ & mu- Beams, 2) Muon Ionization 6-Dimensional Cooling Channel, 3) Muon Ionization Final Cooling Channel, 4) Acceleration to the TeV Energy Scale for Muon Colliders, 5) Muon Collider Magnet Needs, 6) HTS Magnet Development. Based on the recent development, we can look forward future Muon Colliders.

- Muon Colliders offer an energy-efficient path to multi-TeV CoM energies
- Recent physics studies indicate that important collider physics is accessible
- The MAP R&D Program and the MICE Experiment have demonstrated the feasibility of key accelerator physics concepts
- A new International Muon Collider Collaboration is now leading the design effort with the goal of being able to deliver a multi-TeV muon collider sometime in the 2040s
- This effort needs the strong engagement of the magnet community in order to succeed).

**Keywords (Index Terms)** — Muon Collider, high energy physics, accelerator, superconducting magnet.