Muon Collider R&D – Potential US Engagement

Design Study Engagement ($)
- MAP Designs are the foundation for the IMCC Effort
  - Support US Engagement with each of the sub-system designs
  - Effective knowledge transfer to enable rapid progress
  - Incorporate final R&D and design results from the US program
- Next generation MDI at higher energies and interface to detector/physics teams
- End-to-end simulation incorporating muon multi-physics elements
- Ensure our ability to explore US siting options

Technology Development Engagement ($$)
- Magnet Technology
  - Collider Ring – High Field Magnets
  - Accelerator Rings – Fast Ramping Magnets O(1kT/s)
  - Cooling Channel
    - Solenoids for 6D cooling
    - Very high field solenoids for final cooling
  - Target Solenoid
- RF
  - Cooling Channel
    - NCRF in magnetic fields
    - Explore cold copper technology for 6D modules
  - SCRF for acceleration chain
  - Need for Test Stands

Test Facility/Demonstrator Engagement ($$$)
- 6D Cooling Demonstrator
  - Fully engineered cooling module
    - RF prototypes
    - Magnet prototypes
  - Integrated cooling module demonstrator
    - With protons ⇒ Intensity
    - With muons ⇒ Cooling
      - Requires intermediate Muon Source (e.g., nuSTORM type)
- Fast ramping magnets and power converters for acceleration chain
- Leverage facilities to demonstrate:
  - Radiation and shock resistance of targets and SC coils
  - High gradient SCRF
  - High-field dipoles

Unique Cross-cuts
- $C^3$ cold copper cavities for cooling
- FCC high-field dipole development
- Others?