Muon Collider R&D Coordination Group

Sergo Jindariani (Fermilab), Diktys Stratakis (Fermilab), Sridhara Dasu (UW-Madison)

March 28th, 2023

Snowmass Muon Collider Forum

- The forum goal was to build a strong collaboration between the AF+EF+TF frontiers for Muon Collider (MuC) research
- Monthly meetings and dedicated workshops for 18+ months before Snowmass: 160 e-mail subscribers, 50-100 regular participants
- The report of the MuC Forum report is now public: 180+ authors, 50% are early career scientists
- What the forum asks:
  - Engagement in the International Muon Collider Collaboration (IMCC)
  - Contribute in physics studies, detector and accelerator R&D
  - Study options for hosting a Muon Collider in the US

Request for P5 input

On March 1st, Fermilab directorate asked Diktys Stratakis (Fermilab) and Sergo Jindariani (Fermilab) to prepare and organize input to the P5 committee on the US Muon Collider efforts

- Serve as **points of contact** for a broader, national effort, beginning to organize input for P5
- Develop a **notional budget profile** for a Muon Collider R&D program to be able to present to P5
- Reach out to other relevant **experts** from the community including and beyond Fermilab, to join this effort
- Asked Sridhara Dasu (UW-Madison) to join us and represent User community in organizing these efforts

R&D Coordination Group formation

- Keep Accelerator + Detector + Theory united
- Focus on key elements of **10 TeV accelerator and detector design**
  - Break work into individual areas; keep tight connection with the IMCC

Physics Case Development:
Patrick Meade (Stony Brook), Nathaniel Craig (UCSB)

Accelerator R&D Focus Areas:
Muon source:
Mary Convery (Fermilab), Jeff Eldred (Fermilab), Sergei Nagaitsev (JLAB), Eric Prebys (UC Davis)

Machine design:
Frederique Pellemoine (Fermilab), Scott Berg (BNL), Katsuya Yonehara (Fermilab)

Magnet systems:
Steve Gourlay (Fermilab), Giorgio Apollinari (Fermilab), Soren Prestemon (LBNL)

RF systems:
Sergey Belomestnykh (Fermilab), Spencer Gessner (SLAC), Tianhuan Luo (LBNL)

Detector R&D Focus Areas:
Tracking Detectors:
Maurice Garcia-Sciveres (LBNL), Tova Holmes (Tennessee)

Calorimeter Systems
Chris Tully (Princeton), Rachel Yohay (FSU)

Muon Detectors
Melissa Franklin (Harvard), Darien Wood (Northeastern)

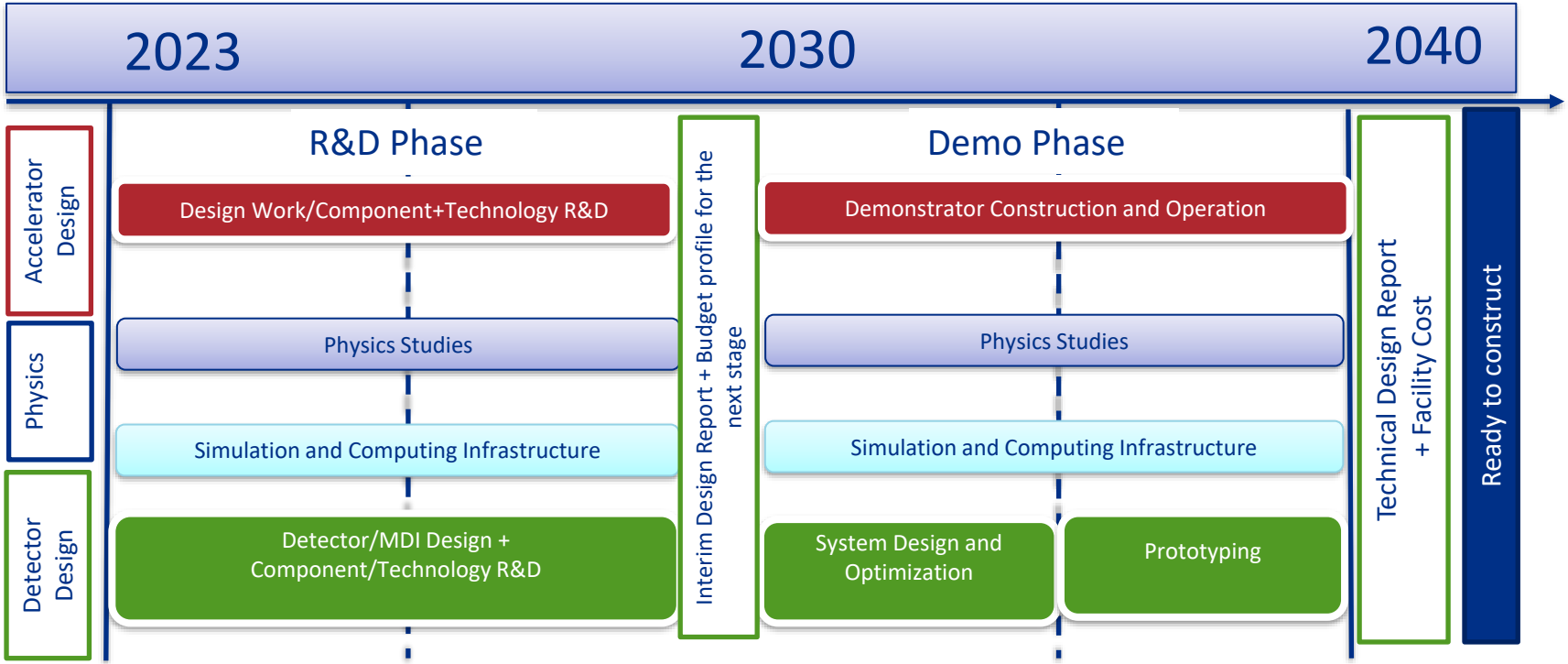
Electronics/TDAQ
Darin Acosta (Rice), Isobel Ojalvo (Princeton), Michael Begel (BNL)

MDI+Forward Detectors:
Kevin Black (Wisconsin), Karri DiPetrillo (Chicago), Nikolai Mokhov (Fermilab)

Detector Software and Simulations:
Liz Sexton-Kennedy (Fermilab), Simone Pagan Griso (LBNL)

International Liaisons:
Daniel Schulte (CERN), Chris Rogers (RAL), Donatella Lucchesi (INFN), Federico Meloni (DESY)

Sketch of a possible US R&D Timeline



Fermilab

Timeline

- BNL P5 townhall – Apr 12-14th : expect 1-2 talks on MuC (physics & detectors)
- SLAC P5 townhall – May 3-5th: expect one talk on MuC (accelerator)
  - Reporting on the international participation how we anticipate this will develop over time is very important. IMCC help is very much appreciated here!
- Work beyond the P5 townhalls
  - Identify possible synergistic activities with generic accelerator and detector R&D
  - Identify overlaps with ongoing IMCC efforts
  - Revise the budget profile as necessary
  - Continue to provide interfaces with IMCC and P5/EPP until a US Muon Collider organization is formed