Future Circular Collider
"Physics, Experiment, Detector Panel"

Muon Detector & Gaseous Detectors
(Preparation for P5 meeting)

Coordinators:

Marcus Hohlmann (Florida Inst. of Technology, hohlmann@fit.edu)

Bing Zhou (U. Michigan, bzhou@michigan.edu)

Meeting #4

Apr 5, 2023

FCC

- Agenda
  - P5 Town Hall Meeting (12-April 14, 2023): Timetable · Indico (bnl.gov)

Thu, 4/13

INTERNATIONAL - (1) View from KEK (remote)	*Masa Yamauchi*	
Berkner Hall, Brookhaven National Laboratory	08:30 - 08:50	EDT
(2) View from IHEP (remote)	*Yifang Wang*	
Berkner Hall, Brookhaven National Laboratory	08:50 - 09:10	
(3) View from CERN	*Fabiola Gianotti*	
Berkner Hall, Brookhaven National Laboratory	09:10 - 09:40	
Coffee Break		
Berkner Hall, Brookhaven National Laboratory	09:40 - 10:10	
FUTURE COLLIDERS -- (1) Implementation Task Force	*Thomas Roser*	
Berkner Hall, Brookhaven National Laboratory	10:10 - 10:40	
(2) Physics at Higgs Factories (circular & linear)	*Liantao Wang*	
Berkner Hall, Brookhaven National Laboratory	10:40 - 11:10	
(3) Detector Circular Colliders	*Srini Rajagopalan*	
Berkner Hall, Brookhaven National Laboratory	11:10 - 11:35	
(4) Detector Linear Colliders	*White Andrew*	
Berkner Hall, Brookhaven National Laboratory	11:35 - 12:00	

Update from last coord. meeting

- Presented a draft of the MDGD slide for the P5 townhall talk to the coord. group
- Srini incorporated that into his slide draft:

Gaseous Detectors (M. Hohlmann, B. Zhou)

❖Significant expertise in U.S. built over past decades at the Tevatron/LHC and NP experiments: 11 institutes with ~50 physicists have already expressed interest.

❖Three thrust areas identified as key areas of engagement for U.S.:

- Develop robust, large-area muon/gaseous detectors with fast timing and high spatial resolution.
  - Muons play a key role in precision measurement of Higgs, Z→μμ provides a key benchmarking point
- Create a US-based R&D facility for MPGDs at a national lab (JLab? – synergy with NP)
- Develop services and infrastructure for these systems.

❖Develop and test the initial prototypes and electronics and establish the MPGD facility by ~2028 (FCC approval) to lay the foundation for a significant participation.

- Large Area (at low cost)
- Time resolution (< 1 ns)
- Fine Granularity and high spatial resolution → momentum resolution
- High-rate capability of *O*(10 kHz/cm^2)
- Low mass detectors when used as inner tracking devices

Update from last coord. meeting

- Our feedback
  - Add LLPs to physics motivation
  - Add L1 trigger capabilities for muons
  - Write out "Micro-Pattern Gas Detectors" at least once

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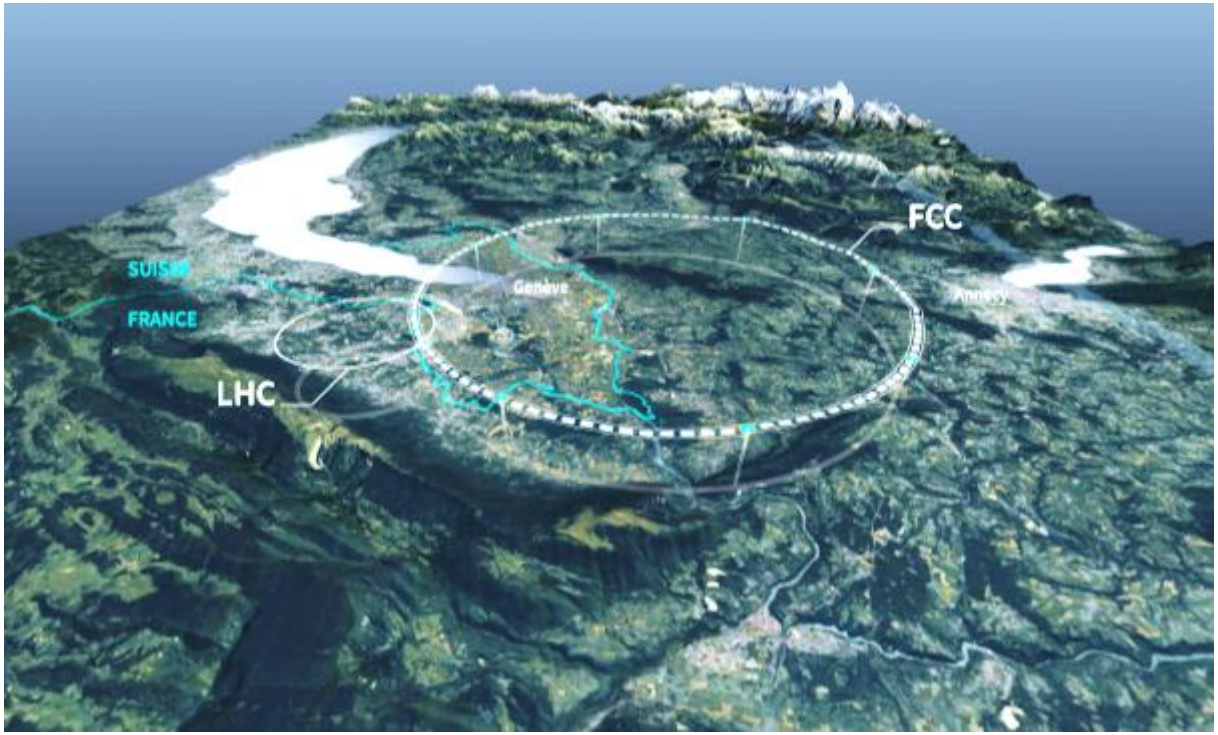
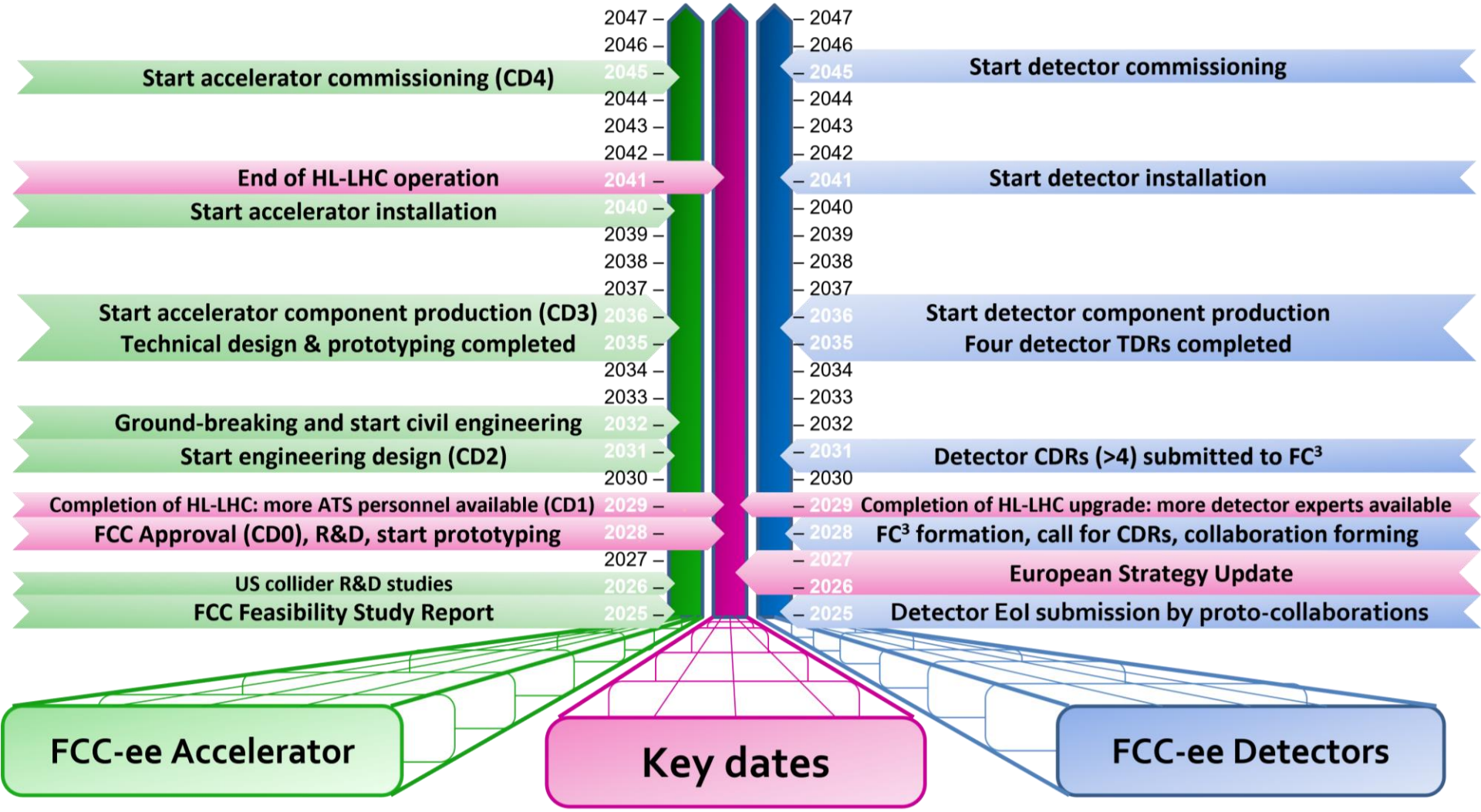


The End

Thank you!

Backup

FCC – Timeline Update



- From Michael Benedikt via Srini Rajagopalan