US HFCC L2: Machine-Detector Interface

Spencer Gessner, SLAC
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FCC-ee MDI Meeting

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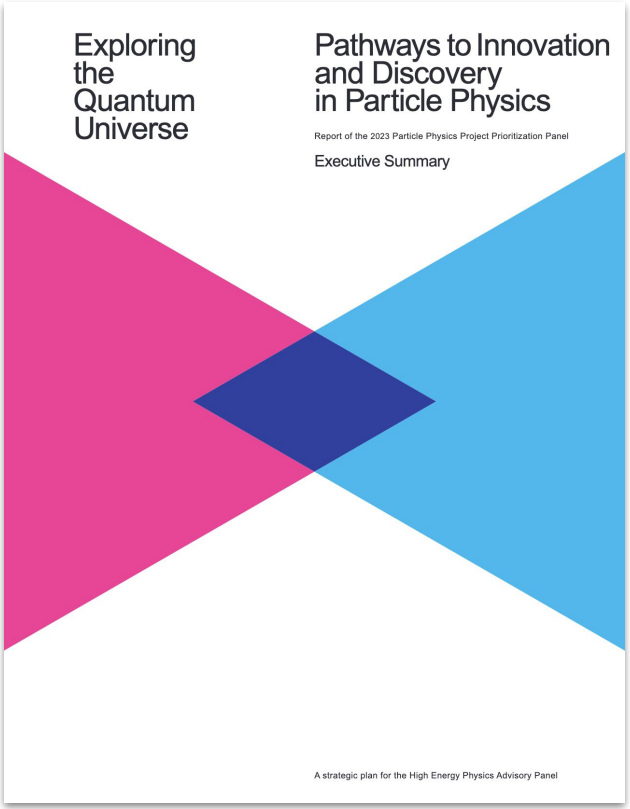
SLAC NATIONAL ACCELERATOR LABORATORY
Jefferson Lab
Stanford University
U.S. DEPARTMENT OF ENERGY

US P5 Report

P5's recommendations for Future Colliders:

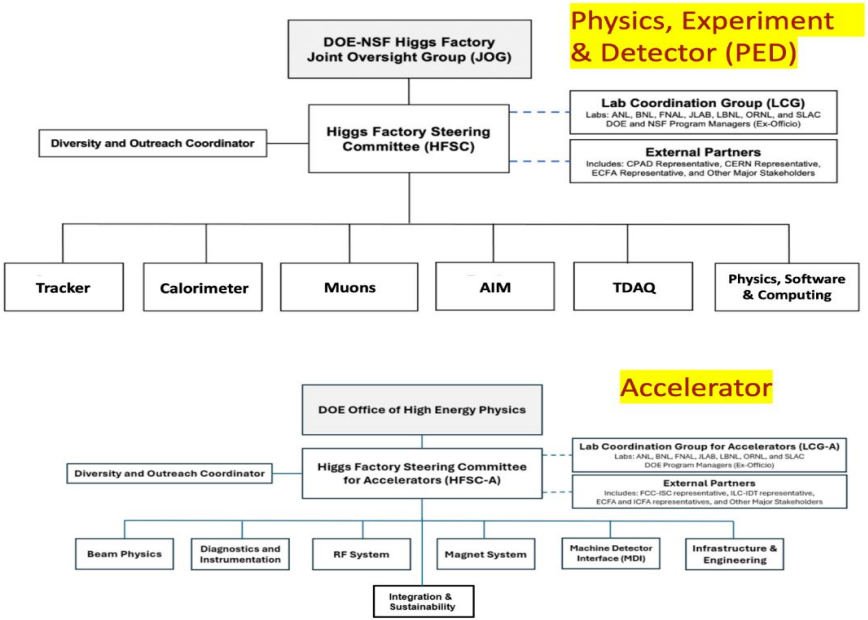
2c. An **off-shore Higgs factory**, realized in collaboration with international partners, in order to reveal the secrets of the Higgs boson. The current designs of **FCC-ee** and ILC meet our scientific requirements. The US should actively engage in feasibility and design studies.



US Higgs Factory Coordination Consortium (HFCC)

HFCC Organization

Created by DOE and NSF, **in response to the P5 recommendation,** the Higgs Factory Coordination Consortia (HFCC) provides strategic direction and leadership for the U.S. community to engage, shape, and thereby advance the development of the PED and Accelerator program for a potential future Higgs factory; and to ensure cooperation with our partners in the international program.



As part of the, the HFCC is responsible for preparing the charge input to the the ongoing ESPPU

S. Rajagopalan, BNL

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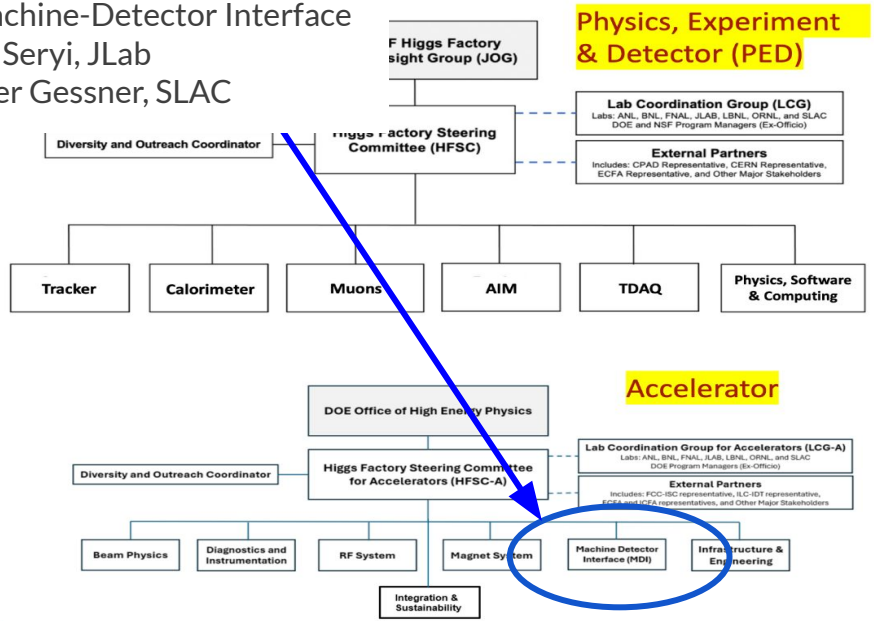

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L2 Guidelines

- Identify potential areas where US can make leading and significant contributions
- Expand on previous US achievements and our expertise & capabilities
- Collect input from community and encourage proposal submissions
- Think about interplay with PED and where joint projects can benefit both
- Work with FCC project management to ensure our input is relevant and desire
  - Attend FCC-ee MDI meetings!

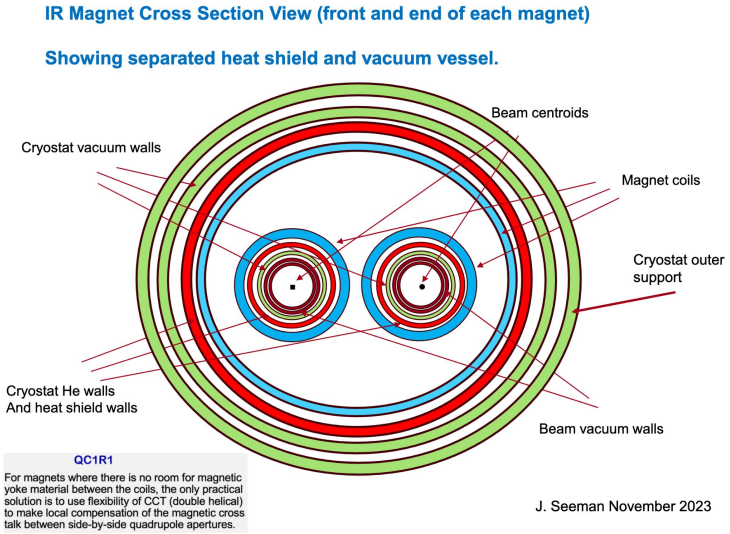
L2 Goals

Goal: Select a set of R&D topics that will contribute to the Higgs Factory designs while augmenting core capabilities in the US and, ideally, will lead to a significant role in a future construction project.

- Communicate with the broader US accelerator community to encourage the development of proposals from US participants for collaboration on the FCC-ee within the L2 subject area.
- Help develop criteria for proposal reviews and assist in the review process.
- Track progress and spending of the accepted proposals within the L2 subject area.
- Participate in the annual collaboration meetings and program progress reviews.
- Arrange an annual in-person meeting and quarterly virtual meetings focused on the specific L2 topics which might be combined with other L2's working on overlapping topics.

Future Efforts in the US

- Modeling beam-beam interactions
  - Build on existing simulation efforts and collaboration between LBNL and SLAC.
- IR Magnet system mock up
  - Proposed by J. Seeman, SLAC
- IR Magnet design
  - Use BNL direct-wind technology
- IR Solenoid compensation design
  - Based on local compensation schemes
- Collimation system design
  - Based on synergy with EIC project
- Others. . .



Beam-Beam Modeling in State-of-the-Art PIC

Large disruption with ILC Beams in WarpX

A. Formenti, LBNL

The development of high-performance, high-fidelity PIC codes for Beam-Beam simulations reduces risks for the collider community.