

Fermilab Physics Advisory Committee March 2025

The Physics Advisory Committee: Halina Abramowicz (Chair), Klaus Blaum, Allen Caldwell, Albert de Rock, Aida El-Khadra, Joseph Formaggio, Elisabetta Gallo, Cecilia Gerber, Stefania Gori, Atsuko Ichikawa, Zach Marshall, Tim Tait, Mayly Sanchez, Niki Saoulidou (Ex Officio), David Schuster

Scientific Secretary: Sergo Jindariani

Report from the LBNC - Niki Saolidou

Charge: For information only

Status and plans for the Fermilab's accelerator complex

Charge: We ask the committee to review the status of Fermilab's accelerator complex. In particular, given the importance of delivering 120 GeV beam to NOvA, 2x2, SpinQuest and TestBeam before the Long Shutdown, as well as preparing the complex for Mu2e and later for LBNF/DUNE, we ask the committee to review the Main Injector run plan for FY26 and the associated risks.

Status of the SpinQuest experiment

Charge: We ask the PAC to review the status of the SpinQuest experiment as well as the potential physics opportunities and plans for the dark sector and additional upgrades, taking into account the updated schedule for the MI beam. The committee is also asked to review the status of the recommendation made at previous reviews:

1. The PAC encourages SpinQuest to collaborate closely with the accelerator group to understand how beam delivery scenarios, together with improvements in data-taking efficiency, can allow them to accomplish physics goals

Report from Microelectronics

Charge: We ask the PAC to review the status of the MicroElectronics (ME) activities at the laboratory and of the recommendations made at past meetings:

1. The lab should help the ME group develop strong bids by providing adequate personnel support and resources for the needed capture team.
2. We recommend that the ME group continue to strive to develop capabilities in service of future HEP needs.

Report from the Collider Physics Division of the Particle Physics directorate

Charge: We ask the committee to review the status of the recommendations made at previous reviews:

1. The PAC notes that the budget challenges faced by CMS are similar to those reported labwide and nationwide. Still, given the time-critical nature of the group's contributions to the upgrades, we encourage the group and the lab leadership to work together with the DOE HEP to ensure that the group has sufficient scientific resources, including postdoctoral researchers, to deliver on US commitments to the CMS upgrade, despite the challenging budget.
2. We recommend the lab continue to explore more efficient methods for the distribution of funds to university and lab partners.

Higgs Factory and Muon Collider Detector R&D status and plans

Charge: We ask the PAC to comment on Fermilab's ongoing and planned detector R&D for the future Higgs Factory and Muon Collider.

Higgs Factory Accelerator R&D status and plans

Charge: We ask the PAC to comment on Fermilab's ongoing and planned accelerator R&D for the future Higgs Factory.

Muon Collider Accelerator R&D status and plans

Charge: We ask the PAC to comment on Fermilab's ongoing and planned accelerator R&D for the future high energy Muon Collider.