

**Fermilab Accelerator Advisory Committee**  
**May 6-8, 2008**

**Charge (Draft Rev. 4)**

The Fermilab Accelerator Advisory Committee is asked to look at a variety of activities supporting the Fermilab strategic plan for the post-Tevatron era. The primary topics for review and discussion are:

**1. Project X R&D Plan**

Fermilab has prepared a Project X R&D Plan aimed at supporting all activities required to complete a technical, cost, and schedule baseline (CD-2 in the language of DOE) by the end of 2011. This plan is integrated with R&D programs running in parallel on ILC, SRF Infrastructure, and High Intensity Neutrino Source (HINS). It is also desirable to develop the design of Project X in a manner that retains the opportunity for future utilization in a muon-based facility (Neutrino Factory or Muon Collider).

The Committee is asked to review and offer comments and recommendations relative to the Project X R&D plan, including the overall strategy, the appropriateness of program goals, timeline, organization, and alignment with the ILC, SRF, HINS, and Muon programs.

**2. Fermilab Muon Program**

The Muon Collider initiative is organized through the Muon Collider Task Force (MCTF) at Fermilab. Activities of the Neutrino Factory and Muon Collider Collaboration (NFMCC) and MCTF are closely coordinated, with NFMCC concentrating on Neutrino Factory design and simulation, and experimental efforts on targeting (MERIT) and 4-D cooling (MICE); and the MCTF concentrating on Muon Collider design and simulation, and technology development for 6-D cooling arrangements that would be applicable to a MC.

The Committee is asked to review the activities of the MCTF and NFMCC activities at Fermilab, and offer comments on the strategic approach, the appropriateness of program goals (including with respect to timing), and the technical progress towards achieving these goals. The committee should note that the national Muon program will have been reviewed by the Muon Technical Advisory Committee four weeks before the AAC meeting. As such the AAC is specifically asked to concentrate on Fermilab's contributions to these programs. In formulating its comments

and recommendations the committee should consider, and offer advice as appropriate, on the interaction between these activities and the broader national and international muon programs.

### 3. Photoinjector Program and Future Directions.

The photoinjector program, currently situated in the A0 laboratory, is under consideration for relocation to the New Muon Lab (NML) in support of beam testing of 1.3 GHz cryomodules sometime in the 2012 timeframe. This relocation could offer the opportunity for a new program of advanced accelerator R&D operating in parallel with cryomodule testing. Such a program could be based on the upgraded photoinjector and/or the 750 MeV electron beam that would be made available via the operation of a complete ILC/Project X RF unit at NML. The committee will be presented with an outline of facility characteristics, an overall scientific strategy, and possible AARD program elements.

The Committee is asked to review the scientific potential for AARD based on the currently configured facility, and possible facilities at NML. We are particularly interested in the Committee's comments and recommendations relative to the following:

- Comment on the competitiveness, nationally and internationally, of potential science programs in each of three scenarios:
  - The current configuration with possible modest upgrades
  - A 50 MeV capability in NML
  - A 200-750 MeV capability in NML
- For each scenario, which program elements seem most compelling?

As usual the committee is invited to issue comments or suggestions on any aspect of the programs discussed beyond those specifically included in this charge. It is requested that a concise report responsive to this charge be forwarded to the Fermilab Director by July 1, 2008.

Thank you.