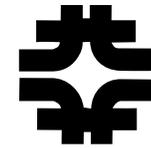


# Project X Accelerator Update

Steve Holmes

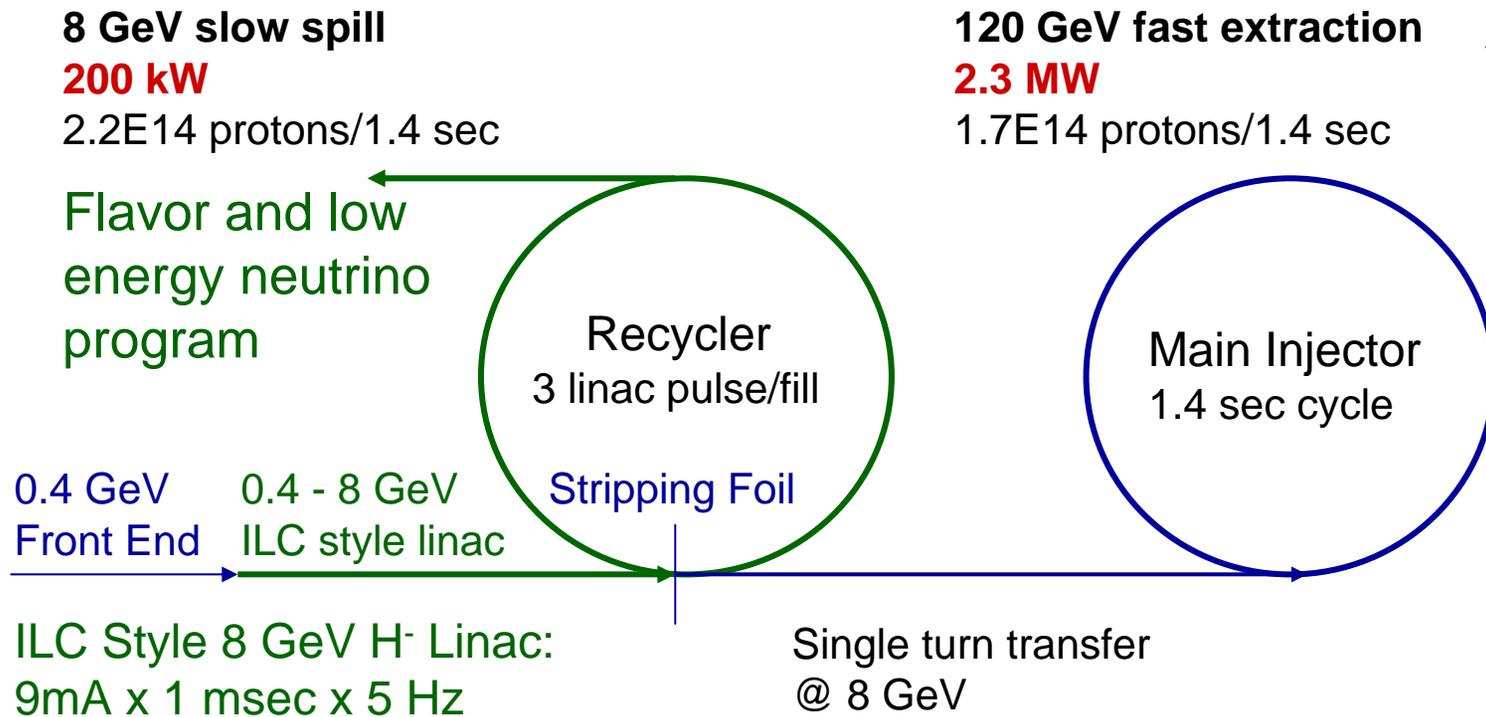
ANL-UChicago-FNAL Collaboration Meeting  
June 27, 2008

# Project X Facility Overview



Project X is a high intensity proton facility aimed at supporting a world leading program in neutrinos and rare decays.

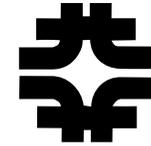
NO<sub>v</sub>A initially,  
DUSEL later



# Project X Facility Overview

## High Level Performance Goals

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### Linac

Particle Type	H <sup>-</sup>	
Beam Kinetic Energy	8.0	GeV
Particles per pulse	$5.6 \times 10^{13}$	
Pulse rate	5	Hz
Beam Power	360	kW

### Recycler

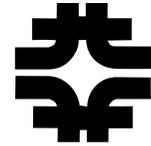
Particle Type	protons	
Beam Kinetic Energy	8.0	GeV
Cycle time	1.4	sec
Particles per cycle to MI	$1.7 \times 10^{14}$	
Particles per cycle to 8 GeV program	$2.2 \times 10^{14}$	
Beam Power to 8 GeV program	206	kW

### Main Injector

Beam Kinetic Energy (maximum)	120	GeV
Cycle time	1.4	sec
Particles per cycle	$1.7 \times 10^{14}$	
Beam Power at 120 GeV	2300	kW

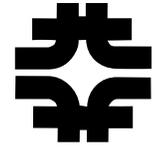
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# Since Last Meeting



- 
- Research Design and Development (R&D) Plan
    - Includes resource loaded schedule
    - Presentation to P5 on 1/31/08  
<http://projectx.fnal.gov/RnDplan/index.html>
  - P5
    - “The panel recommends an R&D program in the immediate future to design a multi-megawatt proton source at Fermilab and a neutrino beamline to DUSEL and recommends carrying out R&D on the technologies for a large multi-purpose neutrino and proton decay detector.”
    - “A neutrino program with a multi-megawatt proton source would be a stepping stone toward a future neutrino source, such as a neutrino factory based on a muon storage ring... This in turn could position the US program to develop a muon collider as a long-term means to return to the energy frontier in the US.”

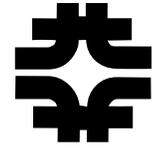
# Since Last Meeting



- 
- Omnibus bill
    - No available M&S for PX in FY08
    - Suspended ILC and SRF programs
  - Collaboration
    - Draft MOU circulating for comment

# Project X RD&D Plan Strategy

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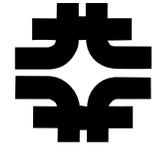


- Working backwards:
    - FY13: CD-3 – Start Construction
    - FY12: CD-2 – Establish Baseline
    - FY10: CD-1 – Establish Baseline Range
      - Requires a complete Conceptual Design Report
    - FY09: CD-0
      - Requires new cost (range) estimate which will be reviewed by DOE
  - FY2008 Goals
    - Establish basic performance parameters;
    - Develop design concept sufficient to form basis of a cost estimate;
      - Baseline Configuration Document
    - Understand how/if the linac could support a 2+ MW upgrade;
    - Form Project X RD&D Collaboration and establish work assignments for FY09.
-

# Project X RD&D Plan

## Collaboration Plan

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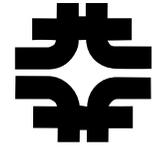


- Intention is to organize and execute the RD&D Program via a multi-institutional collaboration.
  - Goal is to give collaborators complete and contained sub-projects, meaning they hold responsibility for design, engineering, estimating, and potentially construction if/when Project X proceeds.
  - Project X RD&D Collaboration to be established via a Collaboration Memorandum of Understanding (MOU) outlining basic goals of the collaboration, and the means of organizing and executing the work.
  - It is anticipated that the Project X RD&D Program will be undertaken as a “national project with international participation”. Expectation is that the same structure of MOUs described above would establish the participation of international laboratories.

# Project X RD&D Plan

## Collaboration Plan

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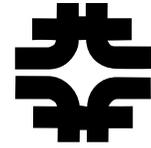


- A draft MOU covering the period through CD-2 is currently circulating for comment among the management of the following potential U.S. collaborators:
  - ANL
  - BNL
  - Cornell
  - LBNL
  - ORNL/SNS
  - MSU
  - TJNAF
  - SLAC

# Project X RD&D Plan

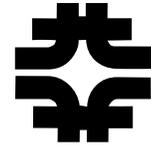
## Collaboration Plan

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- Plan is to have an initial Collaboration Meeting, at Fermilab, in late summer/early fall with the following goals:
    - Form the RD&D Collaboration
      - Sign the Collaboration MOU;
      - Initial meeting of Collaboration Council
    - Agree to baseline performance goals and configuration
    - Establish/bless RD&D organization
    - Establish areas of responsibility and work plan for FY2009
  - Existing/candidate areas for ANL-FNAL Collaboration
    - Cavity processing (Kelly, Rowe)
    - Linac accelerator physics design (Ostroumov, Carniero)
    - Triple spoke resonators (Ostroumov, Kim, Champion)
    - 2 MW target facility (Martens, Grudzinski)
    - CW linac concept (with Muons Inc, etc.)
-

# Summary



- 
- Design concept exists for a facility with >2 MW beam power at 120 GeV, simultaneous with 200 kW at 8 GeV.
  - Design provides flexibility to support a long-term future for accelerator based physics at Fermilab
    - Design aligned with needs of ILC technology development
    - Design concept supports future development of muon facilities
  - Strong support from P5 and HEPAP
    - Emphasis on neutrino beam to DUSEL
  - Project X RD&D plan developed through CD2 (2011-2012)
    - Integrates effort on Project X, ILC, and HINS
  - Working towards organizing as a national project with international participation.
    - ANL-Fermilab collaborations being established
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