



# Towards a Future Long-Baseline Neutrino Experiment

Bob Wilson

Colorado State University

CERN Prototype/Beam Test Meeting

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# Outline

- Worldwide development
- European Strategy/US P5
- Fermilab International Facility Host
- Post P5 Actions
- Current status and goals



# Worldwide Development

- Regional development for > 10 years
  - NNN conference series since 1999
  - LAGUNA/LBNO Design Studies – final report Aug. 2014
  - DUSEL -> LBNE – CDR and DOE “CD-1” approval Jan. 2013
  - (Hyper-Kamiokande – small matter effect)
- Technology
  - Water, Liquid, Scintillator, Liquid Argon
  - Liquid Argon TPC convergence for long baseline



# European Strategy/US P5

- European Strategy for Particle Physics (May 2013)
  - *CERN should develop a neutrino programme to pave the way for a substantial European role in future long-baseline experiments. Europe should explore the possibility of major participation in leading long-baseline neutrino projects in the US and Japan.*
- Particle Physics Project Prioritization Panel (May 2014)
  - *Recommendation 13: Form a new international collaboration to design and execute a highly capable Long-Baseline Neutrino Facility (LBNF) hosted by the U.S. To proceed, a project plan and identified resources must exist to meet the minimum requirements in the text. LBNF is the highest-priority large project in its timeframe.*



# Fermilab LBNF Host

- Fermilab is organizing to host an international facility to support a long-baseline neutrino experiment
- Major lab focus on PIP-II (Proton Improvement Plan) leading to mega-watt class source for neutrinos
- Committed to building infrastructure for far/near sites
- Discussing with DOE, CERN, non-US funding agencies how to “internationalize” the lab
  - e.g. Working Group on Int’l Project Management for LBNF
- New Neutrino Division (led by Gina Rameika)
- Fermilab director Nigel Lockyer taking a direct role in the reformulation process

# Rapid Post-P5 Action

- International Meeting for Large Neutrino Infrastructures, Paris, June 2014
  - Agencies reps. issue supportive statement
- Neutrino Summit 2014, Fermilab, July 2014
  - Invited list of PIs spanning world accel. nu community
- Interim International Executive Board, Sept 2014
  - “In principle” interest in a Fermilab-hosted facility + agencies
  - Develop a “Letter of Interest (LOI)” that would have broad acceptance
- Geotechnical Working Meeting at SURF, Oct 2014
  - Participation by iIEB reps. from LBNO and LBNE

# iIEB – Sept 2014



# Status and Goals

- iIEB meeting – this afternoon
  - Report from visit to Sanford Lab
  - Discussion of the draft LOI
  - Possibility of all-PI meeting(s) in December
- Goals
  - Form new collaboration; submit LOI with broad community support to January 2015 meeting of Fermilab Program Advisory Committee (PAC); dissolve LBNE, LBNO, iIEB
  - “Proposal” by summer 2015 PAC
  - Conceptual Design Report ~fall 2015



# (E)LBNF R&D Coordination Goal

- Concept for future management/funding structure
  - Separation of infrastructure (accelerator complex, near/far sites incl. cryosystems) from detectors – like CERN/LHC
  - Collaboration Proposes: Experimental program at Fermilab-hosted Long-Baseline Neutrino Facility
- Worldwide Coordination/Participation in both Facility and Experimental Program
- New collaboration coordination
  - LBNE CERN beam test and WA105
  - Other related LAr R&D and experiments

# Path Forward

