International Governance for LBNF

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Working group on international governance for LBNF

- An informal forum for discussions about the higher-level aspects of international governance for LBNF
- Coordinated with the iIEB, as a resource for international governance aspects of the LBNF proposal
- Deliverable is a short whitepaper describing a possible model for governance of LBNF with a strong international footprint
- Also highlighting issues requiring further attention

Working group members and contacts

- Purniah Boddapati
- Carlos Henrique de Brito Cruz
- Jun Cao
- Brajesh Choudhary
- Paco Del Aguila
- Antonio Ereditato
- Josh Klein
- David Lissauer
- Joe Lykken (chair)
- Antonio Masiero
- Tony Medland
- Marzio Nessi
- Andre Rubbia
- Michael Salamon
- Jim Strait
- Robert Svoboda
- Agnieszka Zalewska

Have also gotten valuable information and feedback from

- Sergio Bertolucci
- Mike Procario of DOE HEP

Other feedback is welcome!

International Governance of what?

A long baseline neutrino program hosted by Fermilab, with one or more large LAr far detectors deep underground at the Sanford Lab, and one or more near detectors in the >1 MW neutrino beamline at Fermilab

- An international science collaboration (placeholder name “ELBNF”), which will design, build, operate, and do scientific research with a system of neutrino detectors, and also enable other research opportunities such as searches for baryon number violating processes and neutrino astrophysics.
- A Long Baseline Neutrino Facility providing the neutrino beam that will illuminate the neutrino detectors, as well as conventional facilities and major technical infrastructure to support the beamline and the detectors.

General observations

- The new international collaboration should develop the science strategy, design, and optimization of the experiment ("bottom–up process"). This will attract the best scientists and result in the best experiment.
- Design of the experiment cannot be limited to the detectors since, e.g. beam optimization will play a crucial role. The Collaboration must have a well defined interface to the infrastructure.
- Bottom-up experimental design must iterate with funding agencies to make sure scope matches resources. This will require global coordination to ensure that resources are identified for all elements of the experiment

The LHC model

We adapt the LHC model, with an international detector collaboration, a host lab providing infrastructure, and appropriate international oversight bodies

- The detector projects are in the hands of the new international collaboration, with appropriate oversight by stakeholders
- The LBNF facility infrastructure is a DOE/Fermilab project, in collaboration with international partners
- International oversight and coordination is provided by an International Joint Oversight Group (IJOG), and subsidiary groups:
  - Resource Review Board
  - Experiment-Facility Interface Group
  - Fermilab Physics Advisory Committee

International Joint Oversight Group

- The International Joint Oversight Group (IJOG) will be made up of representatives from each funding agency involved in the neutrino program and provides global coordination across the entire enterprise
- During the formative stages of LBNF, the IJOG would develop the overall division of responsibilities for the construction of detectors and facilities, in the context of bi-lateral agreements and subsidiary agreements between DOE/Fermilab and other stakeholders
- The IJOG would meet as needed to review progress, approve updates to the overall strategic plan presented by Fermilab as host lab

Fermilab roles and responsibilities

Fermilab is directly responsible for the design, construction, installation, commissioning and operation of the facilities and infrastructure that support LBNF:

- The neutrino beamline, including the primary proton beamline, target, horn, decay pipe, absorber, and all primary and secondary beamline instrumentation
- The major technical infrastructure necessary to support the near and far detectors, including cryogenic systems and cryostats
- The conventional facilities for the beamline and near detector on the Fermilab site and for the far detector at the Sanford Underground Research Facility

Fermilab will work with international partners in designing and building these facilities

Fermilab roles and responsibilities

As the host lab, Fermilab will provide oversight for both the facility and detector construction projects, through mechanisms including

- Regular meetings with Collaboration leadership
- Convening and chairing the Resource Review Board(s)
- Convening international peer review by the Fermilab Physics Advisory Committee
- Convening meetings of the Experiment-Facility Interface Group
- Director's reviews of specific management, technical, cost, and schedule aspects of the construction projects

Collaboration roles and responsibilities

The new Collaboration is a self-organized entity bringing together scientific groups from around the world to perform this experiment. It is responsible for:

- The formulation of the scientific strategy and corresponding scientific and technical requirements on the detector systems and neutrino beam line
- The design, construction, installation, commissioning and operation of the near and far detector systems
- The scientific research program conducted with the detectors and LBNF neutrino beam

Project management within the collaboration

- The management of the detector construction project will be delegated to a project management team chosen by the collaboration
- This team will be led by a Technical Coordinator and Resource Coordinator (the ATLAS/CMS model)
- The TC and RC are selected by the collaboration and become Fermilab employees during the project
- The TC and RC report to the collaboration Spokespeople

Resource Review Board

To provide more focused monitoring of each of the two projects, the IJOG will create one or more Resource Review Boards (RRB), made up of representatives of that project's funding agencies and Fermilab management.

RRB roles include:

- Coordinating the development of Memoranda of Understanding
- Monitoring the Common Projects and the use of the Common Funds
- Monitoring the general financial and manpower support
- Resolving issues that may require reallocation of responsibilities among the project's funding agencies
- Endorsing the annual construction and maintenance and operation budgets of the project or experiment

The Collaboration and project management provide regular reports to the RRB on technical, managerial, financial and administrative matters.

Experiment-Facility Interface Group

An Experiment-Facility Interface Group will be established to oversee and ensure the required coordination both during design, construction and the operational phases of neutrino program. This includes:

- Interface between the detector systems provided by the Collaboration and the technical infrastructure of LBNF
- Design and operation of the LBNF neutrino beamline. This is a particularly important activity, since the neutrino-energy spectrum and other characteristics of the neutrino beam, and the ability to measure those characteristics, are a crucial part of the long-baseline experimental program.

The EFIG comprises Fermilab management, Collaboration Spokespeople, Technical and Resource Coordinators, and other members as deemed necessary to carry out the coordination function.

Next Steps

- Goal is to deliver whitepaper to iIEB before Dec 21
- Afterwards iIEB, and then the new collaboration, can evolve the whitepaper in consultation with relevant stakeholders
- Eventually this turns into an international governance plan owned by the International Joint Oversight Group for LBNF