Memorandum of Understanding

between

Stanford University

and

Fermi National Accelerator Laboratory

for

NOνA Experiment R&D and Construction Work

August 17, 2009

I. Preamble

This Memorandum of Understanding is made between Stanford University here and the Fermi National Accelerator Laboratory Particle Physics Division (Fermilab). This document represents an understanding between Stanford University and Fermilab in connection with NOvA detector electrical and mechanical engineering and development work. This document does not constitute a legal contractual obligation on the part of either of the parties. It reflects an arrangement that is currently satisfactory to the parties involved.

II. Responsibilities

1. Activities

Stanford University will perform software development, construction and testing for the NOvA experiment. This MOU covers work on the NOvA, which includes, but is not limited to, the following tasks:

a) Design, produce, and test various software

2. Personnel

The Stanford NOvA Group Leader is Stanley Wojcicki.

3. Deliverables

Stanford will deliver

1. Parts of DAQ software
2. Relevant documentation to be placed on the NOvA docdb

4. Institutional Contribution of Services and Equipment

1) Facilities and Equipment
   a) Personal Computers

2) Operating Costs
   Stanford, subject to adequate funding from the NSF) will support the normal research operating expenses (such as physicists' salaries, physicist travel expenses, miscellaneous supplies, administrative support, etc.) of the Stanford group working on the NOvA experiment.

5. Fermilab Resources Required

Computing support

III. Reporting, Costs and Schedule

1. Reporting

Stanford will document and NOvA docdb notes the procedures, analyses and results obtained as this work progresses. ~~Your Institution Name here~~ Stanford. will provide material for NOvA project monthly reports in a timely fashion, including descriptive material, financial reporting, monthly task status reports and information needed for the NOvA Project's monthly earned value management analysis.

During this period of performance, the NOvA group at Stanford will monitor the costs and progress of this work regularly, with a view to providing ample notice if the cost of the effort is projected to exceed the estimate described in this document or subsequent amendments. If it is determined that additional costs for effort will be required, the Fermilab NOvA Project Manager will evaluate available options and, in consultation with Stanley Wojcicki at Stanford, determine the best means of supplying the additional effort.

2. Cost & Progress Reporting

Stanford and Fermilab will jointly develop annual Statements of Work to provide detailed description of the work covered by this MOU, including cost and schedule estimates. Stanford will monitor the progress of this work in order to provide ample notice of projected deviations from the cost and schedule estimates. If it is determined that additional funds will be needed, the Fermilab NOvA Project Manager will evaluate available options and, in consultation with Stanley Wojcicki, determine the best means of supplying the required resources.

3. Schedule

This work will be carried out during the R&D and construction phases of the NOvA experiment.

IV. Other Considerations

1. Safety and Engineering Practices

All detector components will be constructed in conformity with Stanford safety policies and practices, and normal engineering standards. Detector components that will be installed at Fermilab or at Ash River, Minnesota will be constructed in conformity with Fermilab safety polices and practices and engineering standards.

2. Equipment Ownership

All items purchased or fabricated wholly with funds supplied by Fermilab will remain the property of Fermilab. Such items will be properly identified with Fermilab property tags as required by Fermilab policy. All items purchased with Stanford funds will be tagged as required by Stanford policy.

V. Approval

The following concur in the terms of this Memorandum of Understanding.
These terms will be updated as appropriate in Amendments to this document.

None necessary

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Dept Chair, Dean, Provost as required by your institution – Title, Your Institution Name here
Add other signature lines as necessary

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Stanley Wojcicki - NOvA Group Leader, Stanford University

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J. Cooper – NOvA Project Manager, Fermilab

_____ 11/09/09

M. Lindgren – Acting Head, Fermilab Particle Physics Division

_____ 11/10/09

G. Bock – Fermilab Associate Director for Research