Memorandum of Understanding
between
The International Linear Collider - Global Design Effort
and
The Brookhaven National Laboratory

March 2, 2006

1. Introduction

1.1 *General Description*

The DOE High Energy Physics Advisory Panel (HEPAP) has stated the need for a 500 GeV electron-positron linear collider to address fundamental particle physics questions at the TeV energy scale, and recommended that such a facility be the next major project for the U.S. High Energy Physics program. The International Linear Collider (ILC) is envisioned to be a globally international project to construct such a linear collider to address this mission need. Research and Development (R&D) for the ILC is being carried out by an international collaboration of laboratories and universities, in three regions of the world (the Americas, Asia, and Europe), under the direction of an international Global Design Effort (GDE). The GDE is a virtual organization with members drawn from existing laboratories and universities. Overall co-ordination of the technical activities within the Americas region is the responsibility of the GDE-Americas Regional Director.

This Memorandum of Understanding (MoU) establishes a collaboration between the Brookhaven National Laboratory (BNL) and the GDE, hereinafter referred to as the "Parties", to work jointly on the technical design and R&D needed for the ILC. This agreement between the Parties is made in the context of existing national and international collaborations, does not alter those collaborations, and is not exclusive; other laboratories or universities may join at any time under similar agreements.

This MoU does not constitute a legal contractual obligation on the part of either of the Parties. The Parties' rights and obligations in carrying out the work are governed by their respective DOE or NSF prime contracts.

All work performed by BNL as part of the ILC Collaboration will be coordinated by the BNL ILC Program Leader. Definition of the scope of work and planning of specific work to be done at BNL are the responsibilities of the GDE-Americas Regional Director and the BNL ILC Program Leader. The scope of work done at BNL will be documented in this MoU and future Amendments to it. Detailed work packages to be

completed in a specific frame of time will be described separately in Addenda to this MoU.

1.2 *Objective*

The objective of this MOU is to document the terms of agreement between GDE and BNL under which work in support of the ILC is to be performed at BNL.

1.3 *Scope*

This MoU covers work to be performed at BNL during the R&D and technical design phase of the project. The scope of work to be done by BNL will include elements of conceptual design and modeling, engineering, procurement and fabrication of prototypes, preparation of documentation, and participation in review and management processes. Based upon discussions that have taken place between GDE-Americas Regional Director, BNL, and other collaborating institutions, BNL initially plans to work in the following areas: Accelerator Physics, Design, and Magnet Systems in the Beam Delivery System of the ILC. This agreement does not specify the time of performance of tasks in any particular category, nor does it preclude the addition of tasks by amendment to this MoU.

2. General Provisions

2.1 *Terms and Conditions*

The Brookhaven National Laboratory is managed and operated by the Brookhaven Science Associates under contract with DOE, number DE-AC02-98CH10886. All work performed by BNL in support of the ILC will be consistent with the terms and conditions of this contract.

2.2 *Funding*

Funds for the work to be accomplished at BNL will be agreed to by the GDE-Americas Regional Director and the BNL ILC Program Leader. These funds will be defined in annual Addenda to this MOU. Funds for work done at BNL is support of the ILC will reside at BNL, and transfer of funds to BNL will be made by DOE Financial Plan Transfer. Funding will typically be transferred at six-month intervals to allow for possible adjustments in the work to be done at BNL.

2.3 *Cost Recovery*

It is understood that BNL is operated as a full cost recovery facility. All costs of work done at BNL on the ILC are to be covered by the funds described in Section 2.2 above, and the BNL ILC Program Leader will be responsible for management of these funds. The GDE-Americas Regional Director, in consultation with the BNL ILC Program Leader, may request at any time that specific work on the ILC at BNL be redirected or terminated. BNL will respond to such requests as quickly as possible within DOE and BNL personnel management guidelines.

2.4 *Reporting*

BNL will submit to the GDE-Americas Regional Office semiannual progress reports of the work done at BNL. These reports will contain descriptions of technical progress, statements of goals for the next reporting period, and indications of long-range plans for all work being done at BNL. These reports will be submitted at the midpoint and close of the Fiscal Year, and will become part of technical and budget planning for the GDE.

BNL will submit to the GDE-Americas Regional Office a quarterly statement of costs and commitments incurred for all work being done using the funds described in Section 2.2 above. These reports will become part of the technical and budget planning for the GDE.

2.5 ***Ownership of Equipment***

All equipment purchased or fabricated using the funds described in Section 2.2 above at BNL will be the property of DOE/BNL and shall be subject to the BNL property management system. All equipment purchased by BNL for use in the ILC R&D effort or incorporated into ILC prototypes will remain under control of the GDE until it is deemed by the GDE-Americas Regional Office that such equipment is no longer needed.

2.6 ***Intellectual Property***

Rights with regard to intellectual property are regulated, on the BNL side, by Brookhaven Science Associates and the U.S. Department of Energy. "Intellectual property" includes but is not limited to inventions, technical data, and software. Intellectual property created exclusively by this MoU shall be exclusively the intellectual property of BNL.

2.7 ***Scientific Publication***

All work covered by this MoU will be unclassified. Publications will be collaborative, although either Party has the right to publish information in part or in whole, independent of the other. All publications and all intellectual property developed under this collaboration are subject to BNL's procedures and BSA's contract DE-AC02-98CH10886 with the U.S. Department of Energy, which requires that all publications receive prior copyright and invention review.

2.8 ***Amendments***

This MOU may be modified or amended from time to time by written agreement of both Parties.

2.9 ***Public Information Coordination***

Subject to applicable laws and regulations decisions on the disclosure of information to the public regarding the ILC program shall be made by the GDE-Americas Regional Director following consultation with the BNL ILC Program Leader when appropriate.

3. Plan of Work

3.1 *Statement of Work*

Under this Memorandum of Understanding, BNL will carry out activities in the main program areas listed in Section 1.3. The general scope of the BNL effort is described in Section 3.2 below. Particular activities and deliverables will be specified and agreed upon by the BNL ILC Program Leader and the GDE-Americas Regional Director and documented in Addenda to this MOU.

3.2 *Scope of Work*

3.2.1. *Accelerator Physics Studies and Design Development*

BNL will collaborate in the development of the design optics for the beam delivery and final focus system. BNL has extensive expertise in the accelerator physics study and design of colliding beam interaction region through its work with hadron colliders, electron storage rings, and the electron-proton collider HERA at DESY.

3.2.2. *Magnet Systems*

BNL will provide technical design, engineering, and prototype manufacture and test for the development of superconducting magnets and their support systems and associated instrumentation. Magnets are integral components of all regions of the linear collider but BNL will initially concentrate on specialized compact superconducting magnets required for the beam delivery system. A number of magnets in the ILC present special technical challenges, and overall optimization of magnetic systems is required to achieve performance, reliability, and cost goals throughout the machine. BNL has acquired experience with both specialized and extensive superconducting magnetic systems through its work with hadron colliders, electron storage rings, and the electron-proton collider HERA at DESY.

4. Execution

4.1 *Effective Date*

This MOU shall become effective upon the latter date of signature of the Parties. It shall remain in effect until superseded or five years from the effective date, whichever comes first.

4.2 *Approvals*

The following concur in the terms of this Memorandum of Understanding:

_____	_____
Dr Barry Barish, Director, GDE	Dr Praveen Chaudhari, Laboratory Director, BNL
_____	_____
Date	Date
_____	_____
Dr Gerry Dugan, GDE-Americas Regional Director	Dr. Sam Aronson, Associate Laboratory Director High Energy & Nuclear Physics
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	Dr. Mike Harrison, BNL ILC Program Leader