

**MEMORANDUM OF AGREEMENT
(MOA)
Among**

**Lawrence Berkeley National Laboratory
Lawrence Livermore National Laboratory
Princeton Plasma Physics Laboratory**

INTRODUCTION

The Regents of the University of California operate the Lawrence Berkeley National Laboratory (LBNL) pursuant to Contract # DE-ACO2-05CH11231. The Lawrence Livermore National Security LLC operates the Lawrence Livermore National Laboratory (LLNL) pursuant to Contract # DE-AC52-07NA27344 with the United States Department of Energy (DOE). The Princeton University operates the Princeton Plasma Physics Laboratory (PPPL) pursuant to Contract # DE-AC02-76-CHO-3037 with the United States Department of Energy. The three laboratories are hereinafter referred to collectively as "Laboratories" or "Parties" and individually as "Laboratory".

a) Background: The Laboratories desire and are committed to collaborate as a Heavy Ion Fusion Sciences Virtual National Laboratory (HIFS-VNL) in the conduct of heavy-ion-driven high energy density physics and fusion science, and to promote more rapid progress in these areas through technical management integration of the Laboratories' scientific staff, equipment, and experimental facilities.

b) Purpose: This MOA sets forth certain agreements and understandings that will guide the Parties in their collaboration as the HIFS-VNL. In particular, this MOA establishes roles, responsibilities, and relationships among the Laboratories collaboration as the HIFS-VNL. This MOA is not a DOE Reimbursable Agreement, CRADA, or procurement. Nothing contained in this MOA shall be construed as establishing a partnership, joint venture, or any joint obligation among the Laboratories. This MOA shall not be used to obligate or commit funds and does not restrict the Laboratories in the conduct of their respective businesses.

c) Policy: Each Laboratory agrees to support the efficiency and success of the HIFS-VNL. In part, the efficiency and success of the HIFS-VNL will depend upon the Laboratories full and timely collecting, tracking, and reporting of information concerning the expenditure of funds and completion of tasks in support of this HIFS-VNL agreement. Overall project management and integration support will be charged to final cost objectives consistent with the participating Laboratories' CAS disclosure statements.

DOE-OFES GOVERNANCE OF THE HIFS-VNL

It is understood by the Parties that the DOE-OFES has authority to organize periodic technical reviews of the HIFS-VNL program as an appropriate part of the overall U.S. Fusion Energy Sciences Program. The appropriate balance between the HIFS-VNL and other high energy density physics research within the US fusion energy sciences program is to be determined by periodic DOE reviews.

HIFS-VNL SCOPE

The Parties agree to the technical integration of all work on heavy-ion-driver high energy density physics and fusion science within the HIFS-VNL. This work includes intense beam transport; compression and focusing, especially in neutralization background plasma; effects of gas and electron clouds on beams; intense beam interaction with warm dense plasma targets; advanced theory and modeling; the properties of beam-heated, strongly-coupled plasmas, heavy ion fusion target design, and beam experiments with modeling to test relevant target and driver beam physics, plasma neutralization approaches, and intense beam-plasma interactions and compression physics needed for heavy ion fusion. This framework may be extended later to other participating organizations through their petitions to participate in the HIFS-VNL and mutual agreement of the Parties. The HIFS-VNL may also establish, through memoranda of understanding, collaboration with other organizations that do not formally join the HIFS-VNL.

HIFS-VNL ORGANIZATION AND MANAGEMENT

It is agreed by the Parties that the organizational structure of the HIFS-VNL for the next five year period be that which is depicted in Appendix 1, with personnel as indicated in the organization chart. The organizational structure may be modified by mutual agreement of the Parties. At the signing of this agreement, the Parties will commission an HIFS-VNL Oversight Board. The HIFS-VNL Oversight Board has the authority to select the HIFS-VNL Director, Deputy Directors and any other members of the top management structure of the VNL. It will carry out periodic reviews of HIFS-VNL policies, technical programs and plans, and management appointments. The Director and Deputy Directors will each be chosen from different institutions of the Parties to the MOA. The HIFS-VNL Deputy Directors will report to the HIFS-VNL Director, and will provide technical coordination in the execution of the Parties' HIFS-VNL research activities. Besides responsibilities for the VNL, the Director and Deputy Directors will have responsibility for personnel and other management activities as required by their respective home institutions. In consultation with the Parties and the VNL Director, the HIFS-VNL Oversight Board will appoint a HIFS-VNL Program Advisory Committee (PAC). The PAC will report to the HIFS-VNL Oversight Board and will provide technical and programmatic advice on issues as requested. The HIFS-VNL Director, in consultation with the Deputy Directors, will develop needed program plans, management plans, and financial plans for review as required by either the Department of Energy or by the HIFS-VNL Oversight Board. The present laboratory administrative affiliations of the staff will be preserved in carrying out the HIFS-VNL research. It is expected that the management positions shown in Appendix 1 will be filled by representatives from all Parties. The Parties will, to the extent allowed by security requirements, allow access for all HIFS-VNL participants to all laboratories, including parking permits and badges.

a) Intellectual Property: The rights and responsibilities associated with intellectual property development by an employee arising out of the work performed under the MOA shall accrue to his/her respective employer. The disposition of intellectual property developed jointly by employees arising out of the work under this MOA shall be decided on a case-by-case basis by their employers after full consultation. All intellectual property developed by individual staff under this HIFS-VNL shall be subject to the applicable University of California, Lawrence Livermore National Security LLC, or Princeton University policies and the provisions of the respective M&O contracts with the DOE. The HIFS-VNL Director, or his/her designees, will have the authority to review in advance of submission on all publication by the HIFS-VNL participants.

b) Financial Management: The HIFS-VNL Director, in consultation with the Deputy Directors, manages the disbursement of all HIFS-VNL resources. Coordinated funding requests for the HIFS-VNL, and financial plan transfers due to evolving program needs, are made to the DOE-OFES by the HIFS-VNL Director and the participating Laboratories. The participating Laboratories will include appropriate funding requests for HIFS-VNL research activities as part of the existing DOE contractor financial plan funding process. Funding provided by the DOE-OFES for HIFS-VNL activities is included in the financial plans of the participating Laboratories, covering the activities in support of the HIFS-VNL of their respective employees.

c) Conflict Resolution: To the extent possible, the HIFS-VNL Director shall work together with the Deputy Directors to resolve any procedural or substantive issues arising within this MOA. Issues arising under this MOA that cannot be resolved by the HIFS-VNL Director may be referred for resolution to the HIFS-VNL Oversight Board.

MISCELLANEOUS

a) It is agreed and understood that any work done or actions taken by the Laboratories must be in accordance with the terms and conditions of their prime contracts with the DOE. In case of any conflict between this MOA and the prime contracts for the operation of the Laboratories, the prime contracts shall take precedence.

b) This MOA shall remain in full force and effect for a period of five (5) years from the date of this agreement. Any Laboratory may withdraw from this agreement in its sole discretion upon thirty (30) days notice to the other Laboratories.

c) The foregoing states the entire agreement and understanding between and among the Laboratories, superseding any previous or contemporaneous understandings, commitments, or agreement, oral or written, with respect to the subject matter of this MOA. This MOA may, however, be amended in writing by mutual agreement of the Parties.

d) By mutual agreement of the undersigned, other DOE Laboratories can be included as members of the HIFS-VNL. All policies and agreements set forth in this original MOA would pertain to the extended membership.

e) The effective date of this agreement shall be the date of the last signature of the Parties.

Approved By:

**The Regents of the University of California,
Lawrence Berkeley National Laboratory**



A. Paul Alivisatos, Director
Lawrence Berkeley National Laboratory

September 10, 2010

Date



Stephen A. Gourlay, Director
Accelerator and Fusion Research Division

September 10, 2010

Date

Lawrence Livermore National Security LLC



Tomas Diaz de la Rubia
Deputy Director for S&T
Lawrence Livermore National Laboratory

9/16/10
Date



William H. Goldstein
Associate Director, Physics and Life Sciences Directorate
Lawrence Livermore National Laboratory

9/13/10
Date

**The Trustees of Princeton University,
Princeton Plasma Physics Laboratory**



Stewart Prager, Director
Princeton Plasma Physics Laboratory

9/8/10
Date

**Appendix:
Organization of the Heavy Ion Fusion Sciences Virtual National Laboratory**

**Organization Chart for the
Heavy Ion Fusion Science
Virtual National Laboratory**

