

<b>Subject:</b>  <b>Laboratory Mission</b>	<b>Effective Date:</b> April 22, 1998	<b>Initiated by:</b> Deputy Director
	<b>Supersedes:</b> Revision 0 dated 3/31/93	<b>Approved:</b> Director

## **Introduction**

The DOE Princeton Plasma Physics Laboratory is a Collaborative National Center for plasma and fusion science. Its primary mission is to develop the scientific understanding and the key innovations which will lead to an attractive fusion energy source.

Associated missions include conducting world class research along the broad frontier of plasma science and technology and providing the highest quality of scientific education.

Our vision is “To create the innovations which will make fusion power a practical reality”.

## **Core Competencies**

PPPL is the only single purpose laboratory funded by the U.S. Department of Energy (DOE) for the development of magnetic confinement fusion and for research in the underlying discipline of plasma science. The Laboratory has a highly skilled work force and extensive capabilities for the experimental and theoretical study of plasmas and for the integrated design, fabrication and operation of experimental plasma facilities, including magnets, power supplies and plasma heating and diagnostic systems. Management by Princeton University provides the institutional framework for a broad laboratory based program of education in plasma physics and related science and technology.

The core competencies of the PPPL workforce that enable the Laboratory to achieve its objectives are listed below under the categories of plasma science and technology, engineering and education.

### **Plasma Science and Technology**

- Experimental analysis of stability and confinement in fusion plasmas.
- Plasma theory for fusion and other applications.
- Computational physics and numerical simulation of plasma processes.
- Physics design of experimental plasma confinement facilities.
- Physics and technology of plasma heating and current-drive, including neutral beam and radio-frequency techniques.
- Physics and technology of plasma diagnostics and instrumentation.
- Physics and technology of plasma applications to advance industrial technologies.
- Design and implementation of basic plasma physics experiments, such as those used for studies of magnetic reconnection or plasma-surface interactions.

**Engineering**

- Engineering design and analysis of experimental plasma confinement facilities including magnetics, neutronics, thermal and structural analysis.
- Systems integration and construction management for experimental plasma confinement facilities.
- Operation of experimental plasma confinement facilities.
- Mechanical engineering, including structures, vacuum, cryogenic and tritium systems.
- Electrical/electronic/electro-optic engineering, including power conversion, diagnostic and radio-frequency systems.
- Environmental, safety and health aspects of the operation and decommissioning of activated experimental fusion devices, including tritium operations.

**Education**

- Provision of faculty for an integrated program of courses and research supervision for graduate students in plasma physics and related science and technologies.
- Implementation of a broad, Laboratory-based program of science education for the community-at-large, including undergraduate and pre-college students and science and mathematics teachers at all levels.

The Laboratory organization chart is attached as Figure 1.

