

## **JEFFERSON LAB 12 GeV UPGRADE - REALIZING THE SCIENCE FROM A NATIONAL SCIENTIFIC PRIORITY IN NUCLEAR PHYSICS**

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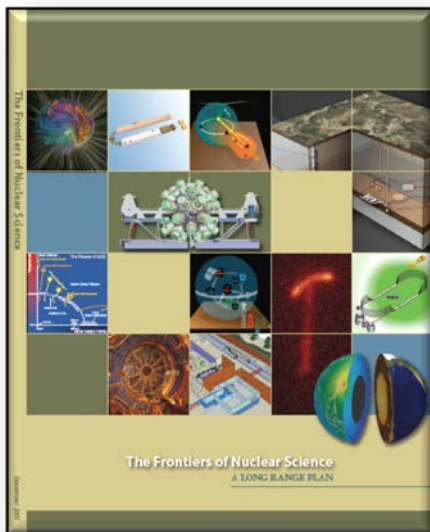
Thomas Jefferson National Accelerator Facility in Newport News, Virginia, one of ten Office of Science national laboratories in the Department of Energy, is nearing completion of the federally funded \$338M 12 GeV Upgrade Project that will maintain Jefferson Lab's and our nation's world leadership position in the field of Nuclear Physics. Funding is critical to support operation of this new facility as we commission the facilities and equipment and transition to 12 GeV Operations and to realizing the discovery-caliber science program it was built for.

The 2013 report to the Nuclear Science Advisory Committee (NSAC) titled "*Implementing the 2007 Long Range Plan,*" stated unequivocally that "**under all scenarios we must capitalize on the investment has been made to upgrade CEBAF.**" The 12 GeV CEBAF upgrade provides capabilities unique in the world, poised to begin discovery caliber experiments to answer fundamental questions such as why

quarks are never found alone. With beam commissioning underway, the upgraded accelerator and the new experimental Hall D are complete and Halls B and C are 70 percent complete.



Aerial view of Accelerator Site



The completion of the 12 GeV Upgrade of CEBAF was ranked the highest priority in the 2007 NSAC Long Range Plan.

### **Leveraging Significant Investments to Advance US Scientific Leadership**

- Jefferson Lab is a unique national resource that will deliver groundbreaking science and discovery well into the next two decades.
  - Original facility represents over \$600M investment with significant contributions from the Commonwealth of Virginia and foreign collaborators.
  - Over the past 6 years, the US has invested nearly \$500M in facility and scientific upgrades - 12 GeV Upgrade, Technology Engineering and Development Facility (TEDF), and other infrastructure projects.



New Experimental Hall D is preparing for beam

### **Realizing Scientific Potential – Supporting Laboratory Operations in the 12 GeV Era**

Demand for 12 GeV CEBAF beam time is extremely high with 50 peer-reviewed and approved experiments requiring more than 7 years' worth of physics running awaiting the beginning of 12 GeV operations. In order to support the needed run time for these experiments, the NP operations budget should support 25 weeks of operations in FY16 and a sustained level of at least 30 weeks of operations in ensuing years under a constant overall budget with modest growth per year.

A shortfall in the operations funding in FY16 will have lasting detrimental effects on the 12 GeV program such as delaying the start of nuclear physics science at the facility and increasing the wait time for experiments. In the FY2016 congressional budget, only 16 weeks of operations will be available. The addition of ~\$9M would increase the reliability of beam delivery, and double this time available for production running in addition to commissioning activities. This would allow the user community to begin to exploit the \$338M investment in the facility and avoid a delay of nearly one year in the initiation of the 12 GeV physics program.

#### **Conclusion:**

***As stated in the recent NSAC Subcommittee report, the US Nuclear Physics program should be capitalizing on the federal investment made in the 12 GeV Upgrade.***

The 12 GeV CEBAF upgrade will allow for ground-breaking science research in the nuclear physics community but the operations funding must be available to ensure the user community can fully capitalize on the investments made by our nation in the Upgrade. A proper level of operations funding would allow university users to deliver a world-leading physics program for the next decade and continue US leadership in this field.