



# Jefferson Lab

**R. D. McKeown**  
**Deputy Director for Science**



January 28, 2014

**Jefferson Lab**  
Thomas Jefferson National Accelerator Facility

# Jefferson Lab – A Worthwhile Investment

Jefferson Lab has been an excellent investment for the Commonwealth:

- \$44M in Virginia investments returned more than \$2B in Federal funding since 1995 (as of 1/2014)
- \$5M for Free Electron Laser (FEL) in mid-1990's leveraged \$120M in Department of Defense research funds
- Virginia's \$9M investment in 12 GeV Upgrade leveraged \$338M in Federal funding – Upgrade now more than 80% complete

# An Intellectual Engine for Virginia Universities

***Jefferson Lab's world leadership position has substantially strengthened Virginia universities in nuclear science and related research and technologies***

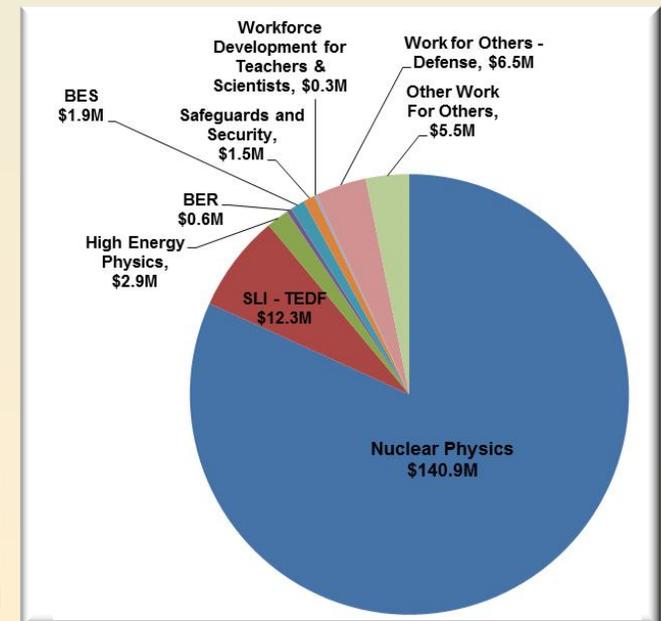
- Eight Virginia universities are actively participating in Jefferson Lab research.
- Significant federal funding has been awarded to Virginia universities related to Jefferson Lab science and technology, allowing them to grow and advance leading research programs
- Virginia universities have a key role in the 12 GeV Upgrade and research program (JMU, ODU, W&M, Norfolk State, University of Richmond, Hampton University, UVA, Va Tech) providing critical equipment or leading approved experiments
- Currently 25 graduate students and two postdoctoral students are funded through JLab at Virginia universities.
- Five Virginia Universities have Joint Professors/Appointments at Jefferson Lab, and 23 of Jefferson Lab's top scientists serve as faculty, adjunct faculty, and research faculty at Virginia universities.

# Jefferson Lab At A Glance

- **Created to build and operate the Continuous Electron Beam Accelerator Facility (CEBAF), world-unique user facility for Nuclear Physics:**
  - Mission is to gain a deeper understanding of the structure of matter through advances in fundamental research in nuclear physics and through advances in photon science and related research
  - In operation since 1995
  - 1,356 active users
  - 176 completed experiments to date; 59 have been approved for the future 12 GeV program
  - Produces more than 1/3 of US PhDs in Nuclear Physics (419 PhDs granted, 204 more in progress)
- **Managed for the Department of Energy (DOE) by Jefferson Science Associates, LLC (JSA)**
- **Human Capital:**
  - 800+ FTEs
  - 23 Joint Faculty, 25 Post Docs, 14 Undergraduate; 30 Graduate Students
- **K-12 Science Education Program serves as national model**
- **Site is 169 Acres, and includes:**
  - 79 Buildings and Trailers; 704K Square Feet
  - Replacement Plant Value: \$317M

## FY 2012:

Total Lab Operating Budget: \$98.0M  
Total Lab Construction Budget: \$62.3M  
Total Non-DOE Budget: \$12.0M  
**TOTAL: \$172.3M**



# Electron Ion Collider - Facility for the Future

## Nuclear Science Advisory Committee (NSAC) 2007 Long-Range Plan:

“An **Electron-Ion Collider (EIC)** with **polarized** beams has been **embraced by the U.S. nuclear science community** as embodying the vision for **reaching the next QCD frontier**. EIC would provide unique capabilities for the study of QCD[Quantum Chromodynamics] well beyond those available at existing facilities worldwide and complementary to those planned for the next generation of accelerators in Europe and Asia.”

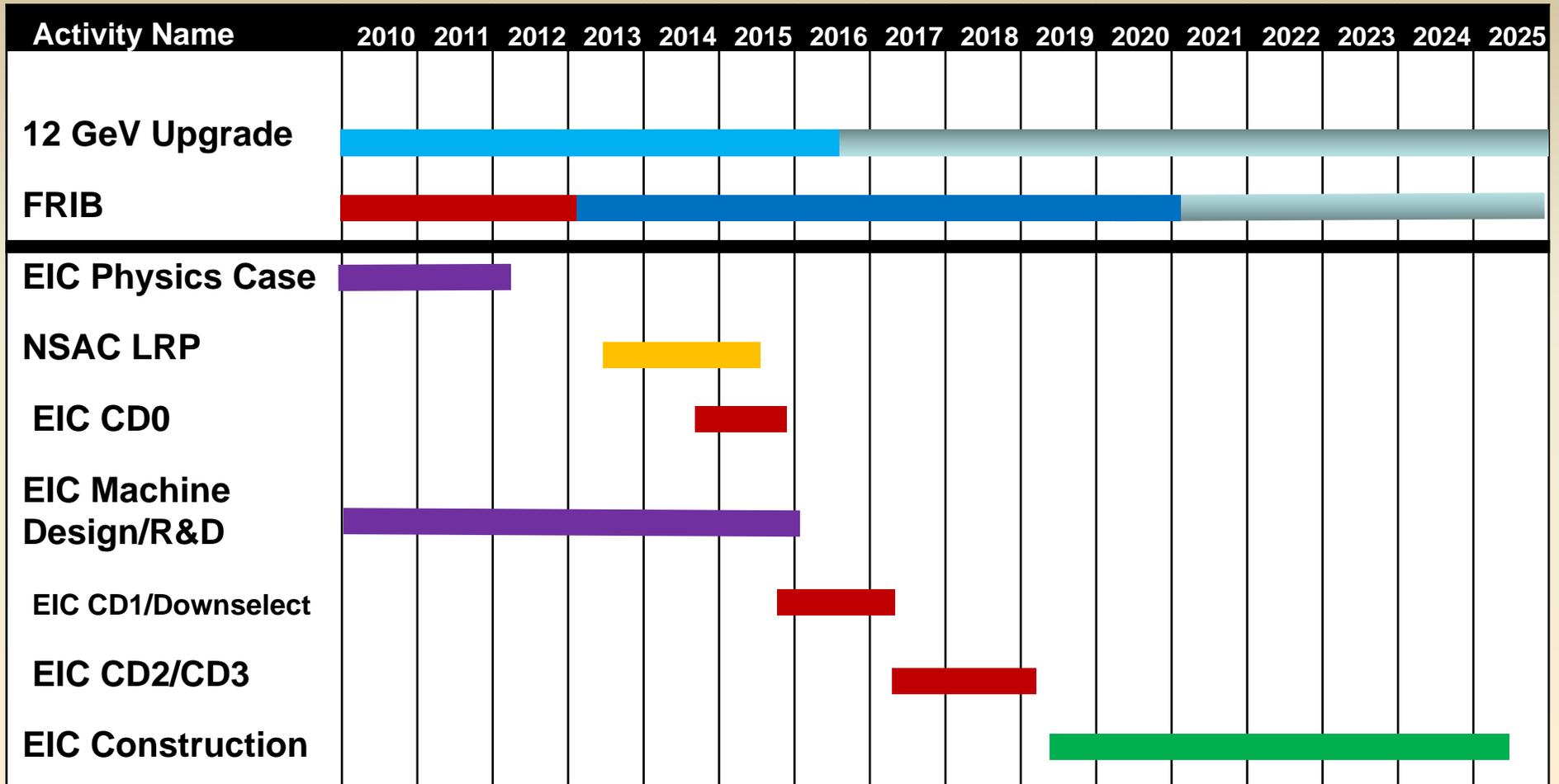
- **New \$600M+ science construction project**
- **Competition with only one other Laboratory**
- **Would secure leadership position of Jefferson Lab in Newport News and in Virginia for many decades**



# Economic Impact of Proposed Facility

- As an engine of economic development, JLab's science programs make a significant impact on the area, state and nation. With its 700+ FTE employment base, in 2011, the Lab generated:
  - \$151 million income and more than **1,700 jobs statewide**
  - \$318 million income and nearly 2,700 jobs nationwide
- A 2014 study – updating the 2011 report by the Wessex Group Ltd., commissioned by Jefferson Sciences Associates – estimates that construction and initial operation of the EIC would create a cumulative **4,974 jobs** over seven to ten years in the Commonwealth of Virginia.
- The 2014 study also estimates that increased spending (direct and induced) resulting from ongoing operations of the new facility will be approximately \$71.6M/year.

# A Path to EIC Realization



*Assumes endorsement for an EIC at the next NSAC Long Range Plan  
Assumes relevant accelerator R&D for down-select process done around 2016*

# Improving Jefferson Lab's Competitive Position

**SB30 includes \$4.6M in the FY15 - FY16 biennium to help improve Virginia's competitive position for the EIC:**

- \$1.3M in FY15 to initiate the site studies; \$2.4M in FY16 to complete the site studies
- \$0.4M in FY15 and \$0.5M in FY16 to attract a leading scientist to Virginia

**These investments are critical and attracting to attracting the EIC to Virginia.**

# Thank You!

## Questions?