

# SURA Board of Trustees

## Lab Director's Report

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**April 7, 2008**

## Delivering Outstanding Performance

- **DOE-evaluated performance (PEMP) for FY07: 97%** → Among top performers in DOE Office of Science
- **Recognized Scientific program** → Excellent Science and Technology Review, dynamic slate of experiments (35 of 50 experiments rated A or A-)
- **12 GeV Upgrade Progressing** → highest recommendation in 2007 NSAC Long Range Plan, on track for CD 3, \$6M included in Virginia biennial budget for 12 GeV Hall D
- **Greatly improved Lab Safety** → exceeded DART and TRC goals, continued focus on behavior based safety, record-breaking performance with 500 (3/18/08) days without a lost or restricted workday.
- **Selected to receive Science Laboratory Infrastructure funding (~\$72M) for Test Lab Rehab and construction of a technology and engineering facility** → *only* single purpose Lab approved for near-term funding, CD 0 milestone achieved

## Fiscal Outlook

- President's budget, American Competitiveness Initiative, and America COMPETES Act all support need for investments in science
  - Omnibus spending bills of FY 2007, FY 2008 fall far short of President's Budget request with integrated loss for JLab ~ \$ 18 M for 2007 and 2008
  - FY 08 inflation-adjusted funding is same level NSAC judged inadequate to support two major facilities in FY06
- In FY 2008, 12 GeV Project is funded at request level, with research and operations funded at FY07 level :
  - Operations reduced by 10 weeks (to 24 weeks), loss of high-profile physics
  - Maximum beam energy capped at 5.7 GeV
  - Key GPP projects delayed
  - Staffing levels barely maintained
- While FY 2009 Budget Request results in excellent budget for JLab (+28.8%) demonstrating DOE support, the threat of CR is high
  - A prolonged CR will jeopardize our ability to maintain staff and possibly project schedule

## Jefferson Lab Priorities through FY14

- **12 GeV Upgrade – meet all milestones consistent with available funding**
  - CD-3 in 4QFY08 (September 08)
  - Complete all construction by 4QFY14
- **Advance understanding of matter in terms of strong QCD and discovery of science beyond the Standard Model**
  - Emphasize high impact experiments, completing 80% of currently approved program prior to 3QFY12 (shut-down for 12 GeV installation)
- **Provide world leading theoretical support for the experimental program at both 6 GeV and 12 GeV**
- **Maintain and consolidate world leadership in SRF and ERL technology**
- **Advance FEL program**
- **Strive for exemplary management and stewardship**

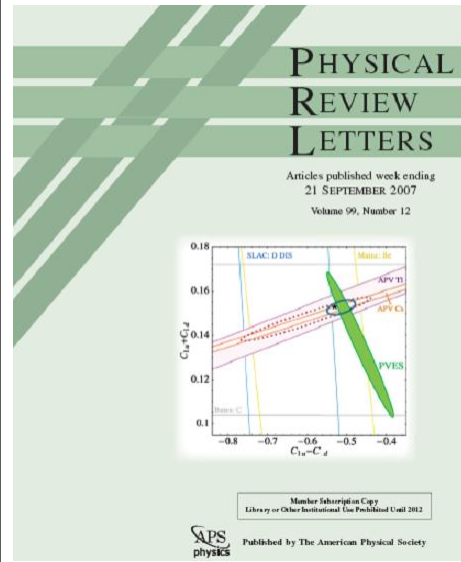
## 12 GeV Progress and Highlights

- Top ranked priority in 2007 NSAC Long Range Plan (up from position 4 in 2002 plan) → strong support by a diverse community of scientists affirms world-class 12 GeV science program planned.
- Cost, schedule, and performance baseline validated by DOE OPA IPR (“Lehman Review”) and DOE OECM External Independent Review → satisfied all 16 OECM criteria for CD-2 approval.
  - CD-2 Approval signed by Undersecretary Orbach on November 9, 2007
  - Passed Earned Value Management System review in December 2007
  - On track for CD-3, approval of construction start in September 2008
- Final Virginia biennial budget (2009-2010) includes \$6M to support the 12 GeV Upgrade

## Highlights of 2007 Scientific Accomplishments

- JLab data on spin structure functions doubles world data-base and yields crucial constraint on polarized glue  $\Delta G$
- Deep Virtual Compton Scattering (DVCS) on  $^3\text{He}$  constrains  $u$  and  $d$  quark angular momentum
  - Crucial for understanding spin crisis (“there is no more spin crisis”)
- $\pi^0$  lifetime – Primex: test of chiral symmetry and axial anomaly in QCD .... Reduces PDG error by factor of 2
- Standard Model Test – using PVES data: Raises the lower bound on the energy scale of Physics beyond the Standard Model to in excess of 1 TeV - a factor two improvement.

## Impressive Gains in Testing the Standard Model



- A JLab analysis of the world data on Parity Violating electron scattering, much of it taken at Jefferson Lab by the G0 and HAPPEX Collaborations, has led to a major improvement in the limits on the masses of possible new particles, e.g.  $Z'$ , which are not part of the Standard Model of Nuclear and Particle physics.
- This work featured on the cover of Physical Review Letters in September.

## Future Directions

### FRIB

- JLab has reached an understanding with FRIB team at ANL to partner in responding to the Funding Opportunity Announcement (FOA) for FRIB
- JLab scope: High-energy part of the superconducting linac, cryomodules and 2K refrigeration, as well as LLRF, couplers, tuners and controls
- JLab is also seeking to collaborate with MSU on their proposal

### ELIC

- R&D program to resolve key technical issues related to EElectron Ion Collider: progress *essential* to guide next NSAC Long Range Plan
- JLab poised to participate in other srf accelerator-based construction projects such as SNS II, Project X, etc.

### JLab role in "next-generation" light source

- Opportunity to use FEL as a vehicle to demonstrate mastery of prerequisite technology, gain visibility and build user community, and to establish JLab as preferred site for Next Generation Light Source.
- Following JSA Science Council guidance to explore, develop, and advance science case

## Summary

- Jefferson Lab is delivering exceptional science, advancing the DOE Office of Science mission as a leader in nuclear physics and in accelerator-related technologies.
  - Highest priority is realizing 12 GeV Upgrade
  - Slate of high-visibility, discovery-caliber experiments
- JSA's approach to management and operation of JLab results in excellent performance as recognized by the Department of Energy.
- Future directions are being explored that will ensure a vibrant future for JLab.
- Appropriation at or near request level for DOE SC in FY 2009 may be a "make or break" condition