



Jefferson Lab News

A rich legacy and exciting future

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 **Jefferson Lab**



U.S. DEPARTMENT
of **ENERGY**

The Nation's Premier Nuclear Physics Lab and Beyond

Jefferson Lab

One of 17 Department of Energy National Labs



Established in 1984

40 Years and counting
Managed and operated by SURATech



~850
Employees



Future Primary Home of the DOE's
High Performance Data Facility (HPDF)



~1,700
Largest nuclear physics user
community in the world with 1/3 of
U.S. NP Ph.D.s based on Jefferson
Lab research

Our Discovery Machine: Advancing Nuclear Physics Research for the Nation

The **Continuous Electron Beam Accelerator Facility** is the highest throughput research accelerator in the world.



Supporting LRP priorities for the user communities in NP.



The Continuous Electron Beam Accelerator Facility (CEBAF) superconducting machine, is unique in the world – the only high-energy accelerator for nuclear physics for the next several years (RHIC, CERN LS3, 2026-30).



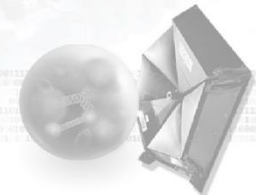
Half-million accelerator control points monitored by AI, improving operation & reliability (86.7% in 2025).



Largest pair of 2 Kelvin cryogenics refrigerators in the world, unique capabilities for the DOE complex.



12 GeV electron beams at up to 10^{39} electrons/second/cm², making it the highest luminosity electron accelerator in the world. We use polarized beams and targets.





SURATech



Jefferson Lab



SURATech

Our Vision

Deliver a thriving multi-program laboratory with world-leading scientific capabilities and User Facilities driven by excellence in Laboratory Operations that enables discoveries in three science pillars aligned with the lab's core capabilities:

1. Nuclear Physics
2. Data and Computational Science
3. Energy and Applied Sciences

Our Scientific Priorities: Three Pillars



**Data and
Computational Science**



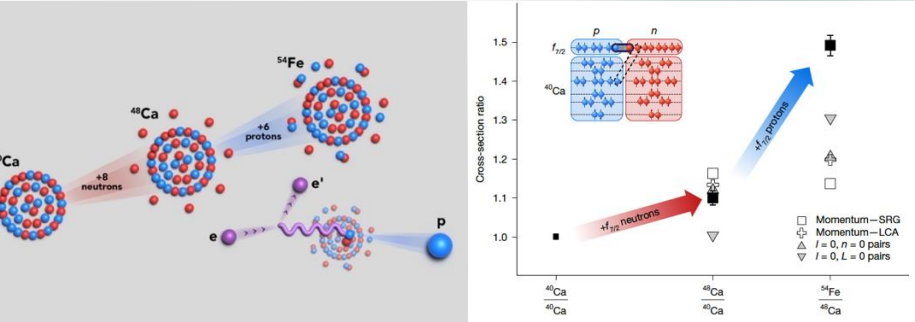
Nuclear Physics



**Energy and
Applied Science**

World-leading science breakthroughs · First-class national capabilities
State-of-the-art operation of DOE-SC facilities

Results from **CEBAF** change our fundamental understanding
Nguyen et al., Nature, June 2026



We are growing our people and the next generation
Christopher Newport University Graduate Summer Workshop in Nuclear and Hadronic Physics 2026



MOLLER will measure the weak charge of the electron with extreme precision



*We are
delivering
on our
commitments
to the
Nation*



EIC is making significant progress in CD-3A & 3B while proceeding to CD-2



HPDF is proceeding to CD-1 and anchoring JLab as multi-purpose



AI & Genesis Mission are changing how we do science & the science we do



The FY27 LDRD strategy aligns with the laboratory's three research priorities

Strong proposals connect a specific technical advance to a credible path for scientific impact

ADVANCED NUCLEAR PHYSICS R&D

Extend CEBAF and nuclear physics capabilities

- Advanced detector technologies
- Next-generation accelerator concepts, including positrons
- Global analysis across experiment, theory, and computation

DATA SCIENCE AND AI

Transform discovery through intelligent infrastructure

- Real-time data processing
- Distributed and scalable data systems
- AI-enhanced accelerator operation and analysis

ENERGY AND APPLIED SCIENCE

Apply Jefferson Lab expertise beyond nuclear physics

- Secondary beams and scattering
- Medical imaging, therapy, and quantum information science
- Environmental applications and technology transfer

Selection question: will the work create a distinctive capability that matters to Jefferson Lab's future?

Jefferson Lab: A Dynamic Future

Focus on National Priorities we are continuing to:



Demonstrate scientific advancement on existing user facilities and building more capabilities for the Nation



Train the workforce of the future of the Nation



Pursue research and technology partnerships



Update and expand existing facility space to optimize impact for the Nation

