News from the Lab & CEBAF 2037



CLAS Collab. Meeting · November 2026

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Jefferson Lab

U.S. DEPARTMENT of ENERGY

Jefferson Lab

SURATech

Our Vision

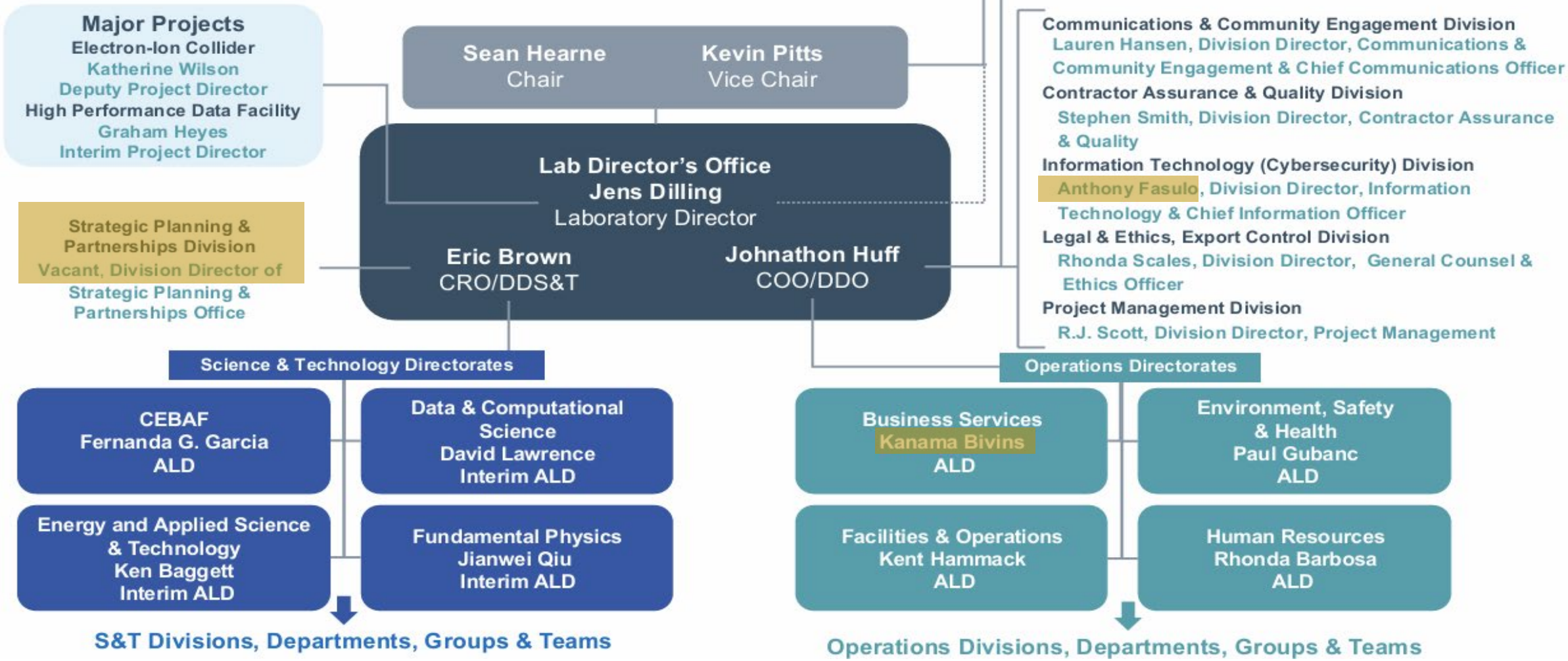
Deliver a thriving multi-program laboratory with world-leading scientific capabilities and User Facilities driven by safety and excellence in Laboratory Operations that enables discoveries in three science pillars aligned with the lab's core capabilities and national priorities:

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

Jefferson Lab

Thomas Jefferson National Accelerator Facility

October 2026



News from JLab – S&T Presentation to SURATech BoD (Oct'26)

SURATech Jefferson Lab

Science and Technology at JLab under SURATech is off to a strong start

- CEBAF/Nuclear Physics Performance continues to be on track with strong technical progress on MOLLER and close collaboration with HENP and TJSO for a BCR to ensure delivery on cost and schedule
- The EIC project is progressing, and Katherine Wilson is making sound impact as the Deputy Project Director and rapidly becoming one of the senior leaders with many changes in EIC leadership
- With the SURATech contract JLDC is now progressing as a necessary step towards HPDF
- With the SURATech contract the new DDS&T/CRO and CEBAF ALD are in place
- The Energy and Applied Science and Technology Directorate (EAST) is positioned for exciting new opportunities to build on JLab core competencies for a broader community
  - We have our first SURATech proposed new BES funded project
- We are participating in 7 Genesis Mission phase 1 projects and 2 phase 2 projects
- Job ads are out for the Data & Computations Science (DCS), Energy & Applied Science & Technology (EAST), and Fundamental Physics ALDs, as well as the HPDF Project Director

4

Courtesy: E. Brown

News from JLab – S&T Presentation to SURATech BoD (Oct'26)

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.



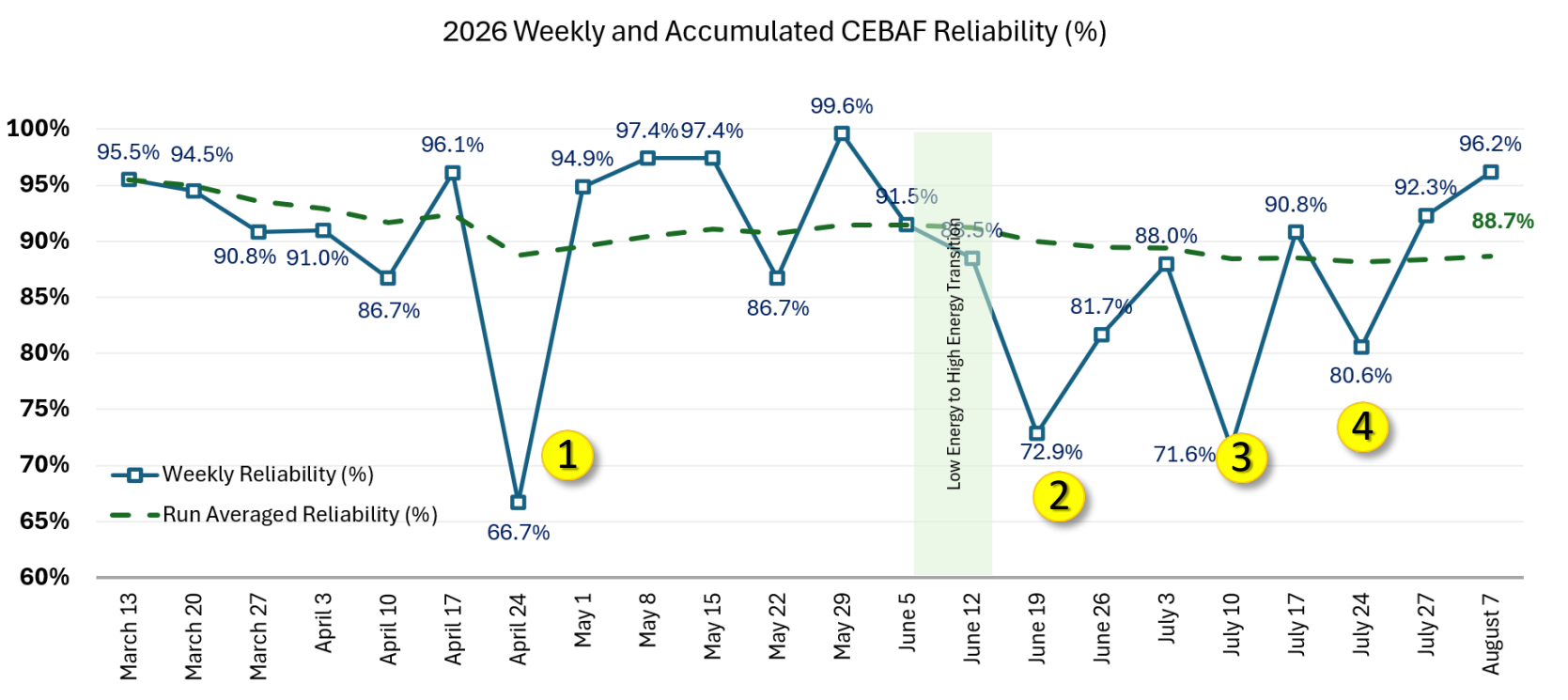
Supporting LRP priorities for the user communities in NP.

- 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 10^{39} electrons/second/cm^2, making it the highest luminosity electron accelerator in the world. We use polarized beams and targets.

Courtesy: E. Brown

FY26 Run at a Glance (Mar 13 – Aug 14, 2026)

- 19 of 22 planned weeks of physics delivered to Halls B, C and D
- Two linac energies (345 and 1,060 MeV/linac); Emax = 11.7 GeV, 600–750 kW
- Average reliability: 88.7% (delivered vs. scheduled beam time)



1. **West Arc LCW leak**
   Cyclone-separator leak shut down the tunnel magnets
2. **MZAAS04 magnet failure**
   Bent beampipe and coil: no beam past 3rd pass, none to Hall D
3. **ARC5 magnet over-temperature**
   Clogged cooling lines; scale from LCW water quality
4. **Waveguide PSS loss + ARC9 over-temp**
   Cracked tunnel bellows; clogged cooling lines

FY26 Physics Delivered

4 experiments completed, 1 finished its FY26 scope, and 5 well underway

Thank you to every collaboration and shift-taker who carried the program through this run

Hall	Experiment	Description	FY26 status
B	**E12-20-004**	PRad-II	Completed
B	**E12-21-003**	X17 Boson Search	Well underway; continues FY27
C	**E12-22-001**	N → Δ	Completed
C	**E12-23-001**	Virtual Compton Scattering (VCS)	FY26 scope completed
C	**E12-24-001**	Nuclear R SIDIS	Completed
C	**E12-06-104**	Nucleon R SIDIS	Completed
C	**E12-06-107**	Color Transparency Search	Started; finishes FY27
D	**E12-25-005**	GlueX with 1–4 GeV photon beam (first low-energy Hall D beam)	Well underway; finishes FY27
D	**E12-12-002**	GlueX-II	200 of 220 days; finishes FY27
D	**E12-12-002A**	Jefferson Lab Eta Factory (JEF)	Run with GlueX-II; finishes FY27

What Went Wrong, and What We're Doing About It

Event	What happened	Fix and status
West Arc LCW leak	Leak at the West Arc LCW cyclone separator caused a loss of magnet cooling, which shut down the tunnel magnets and therefore the beam	Repaired; beam restored during the run
MZAAS04 dipole	Years of magnetic force fatigued the coil-retention hardware; beampipe and coil bent	Repaired during run. Redesigned hardware: 1 of 4 ZA magnets done, parts in hand for the other 3
MYBBS06 dipole	Water leak that could not be repaired in the tunnel	Rebuilt in the Magnet Measurement Facility with a critical-spares coil
ARC5 / ARC9 over-temps	Cooling lines clogged by scale from LCW water quality; cracked bellows (PSS)	East Arc dipole flushing done; drain valves added for fast repeat flushing
2K cold box, CC4 (Aug 14)	Heavy rain entered a magnetic-bearing control cabinet; rotor hard landing ended the run ~2 weeks early	In-house spare installed and tested during SAM





Top: ZA dipole damage.
Below: cold compressor.

FY27 Goals: Fewer Trips, More Energy Headroom

Also this SAM: CHL2 cold-compressor repair · 200 keV injector source



Cryomodule (CM) Upgrades

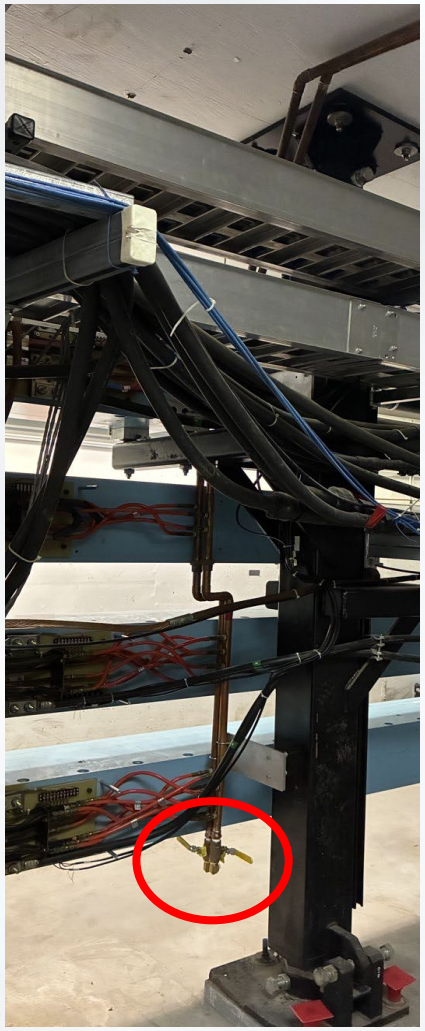
Plasma processing (1L07)
UNDERWAY
Avg +2.3 MV/m per cavity

≈ +12.9 MeV per C100 zone

≈ + 9.2 MeV per C75 zone

1L08 upgrade: C25 → C75
IN PROGRESS

8 kW RF circulators
INSTALLING / TEST
5 kW units cap cavity gradient ~20–30% below what cavities can reach.
8 kW units installed in 1L09 and going into 1L08. If they test well, other four C75s follow



Magnet Flushing & Fixation

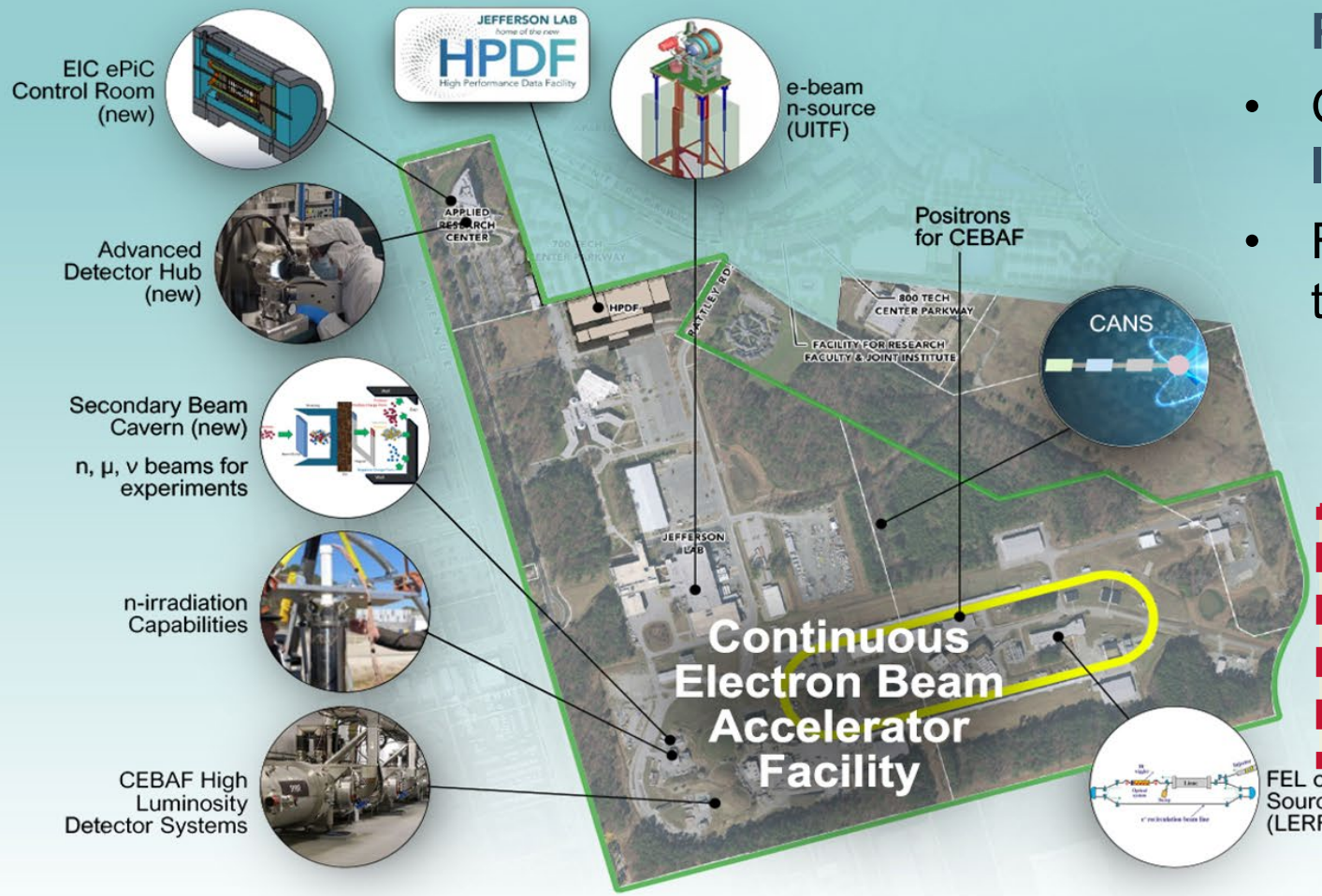
East Arc dipole LCW flushing
INSTALLED
Drain valves added at every East Arc dipole LCW manifold to cut setup time for repeat flushing

ZA magnet beampipe fixation
1 OF 4 COMPLETED
Modification to secure beampipe

AS04 repaired during run

Hardware for the remaining 3 ZAs received – installation will follow

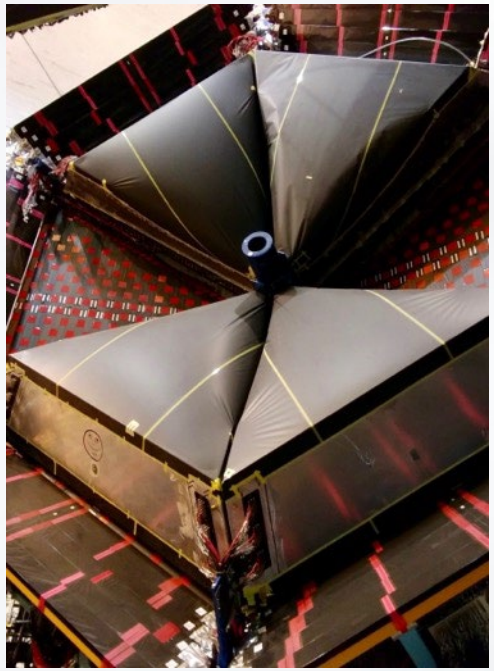
Jefferson Lab: 10/20-Year Outlook

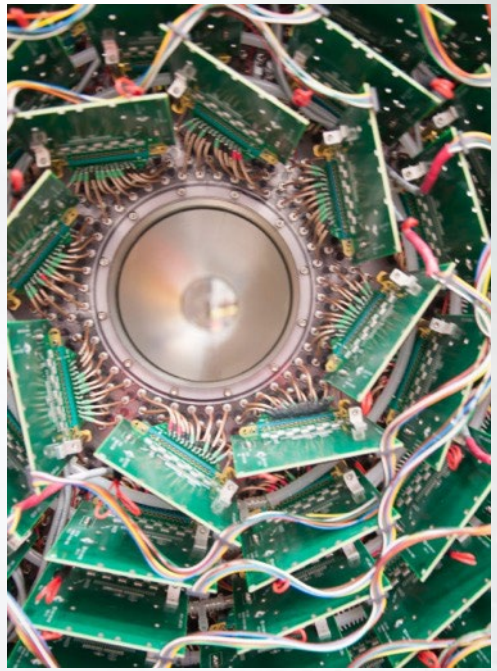


- Continuation of **CEBAF Nuclear Physics Program**
- Growing to a **multi-program laboratory**
- Future expansions proposed over the next 20 years supported by:
  - working with the scientific **user community** for buy in on priorities
  - We are planning community-oriented strategy planning exercises, for CEBAF and other sectors
    - CEBAF 2037 and beyond
  - Beam Dump opportunities in fundamental and applied sciences
  - FEL, n-sources…

CEBAF 2037 – rolled out at APS DNP







A shared science vision for CEBAF's next decade.

Built in the open, with the user community.

Kick-off: December 2026

One Shared Science Vision for CEBAF

12–16 months of open, community-led work toward the white paper, with workshops and town halls throughout

It is

- An open, community-led process to define the science CEBAF is uniquely placed to pursue next
- A plan for the accelerator, instruments and collaborations that science requires
- Built on work already underway: existing community studies are inputs
- Realistic: ambitious science we can fund, build and operate

It isn't

- A decision already made at JLab
- A replacement for today's program: it builds on it
- A closed process: every contribution is considered, with a public account of how input shaped the plan

Developed with the community, JLab, DOE, NSF and international partners

Courtesy: or Hen

Next steps: from kickoff to white paper

DEC 10–11, 2026

Kickoff at MIT

Refine the questions; map opportunities and challenges

Q1 2027

Science workshops

Physics opportunities, key measurements and theory needs

Q2 2027

Technical workshops

Accelerator, detectors, computing; feasibility and resources within funding scenarios

SUMMER 2027

Emerging program

Discussed with the community and reviewed by the Lab (e.g. CEBAF Advisory Committee)

MARCH 2028

White paper

Community supported document, shared with key stakeholders

workshop reports and community input review and prioritization will follow a transparent process led by the Lab, involving the community and engaging stakeholders and relevant committees (e.g. CEBAF advisory committee). Outputs will be shared publicly as the work proceeds.

Jefferson Lab: A Dynamic Future

Focus on National Priorities we are continuing to:

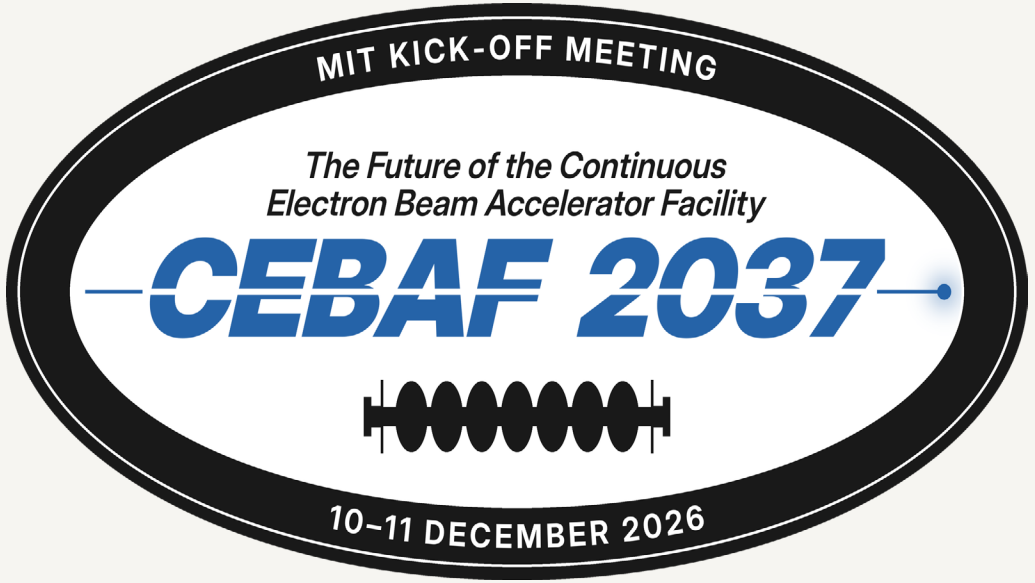
- Focus on CEBAF User Facility and deliver science and discovery in NP
- Operate the laboratory safe, secure, and with high efficiency, upgrade where needed
- Execute EIC and HPDF in partnership
- Planning exercises for the future, with the community and sponsors



Jefferson Lab

Join the CEBAF 2037 Kick-off Meeting

MIT | 10–11 December 2026



Register now

Registration, program and logistics for the kick-off meeting

indico.jlab.org/event/1108/

CEBAF 2037 web page

Charge letter, background and updates on the CEBAF 2037 initiative

jlab.org/physics/cebaf2037