

An aerial photograph of the Jefferson Lab campus, showing various buildings, parking lots, and green spaces. The text is overlaid on the image.

Jefferson Lab- User Perspective

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Nuclear Physics Community Meeting

February 13, 2026

Scientific program

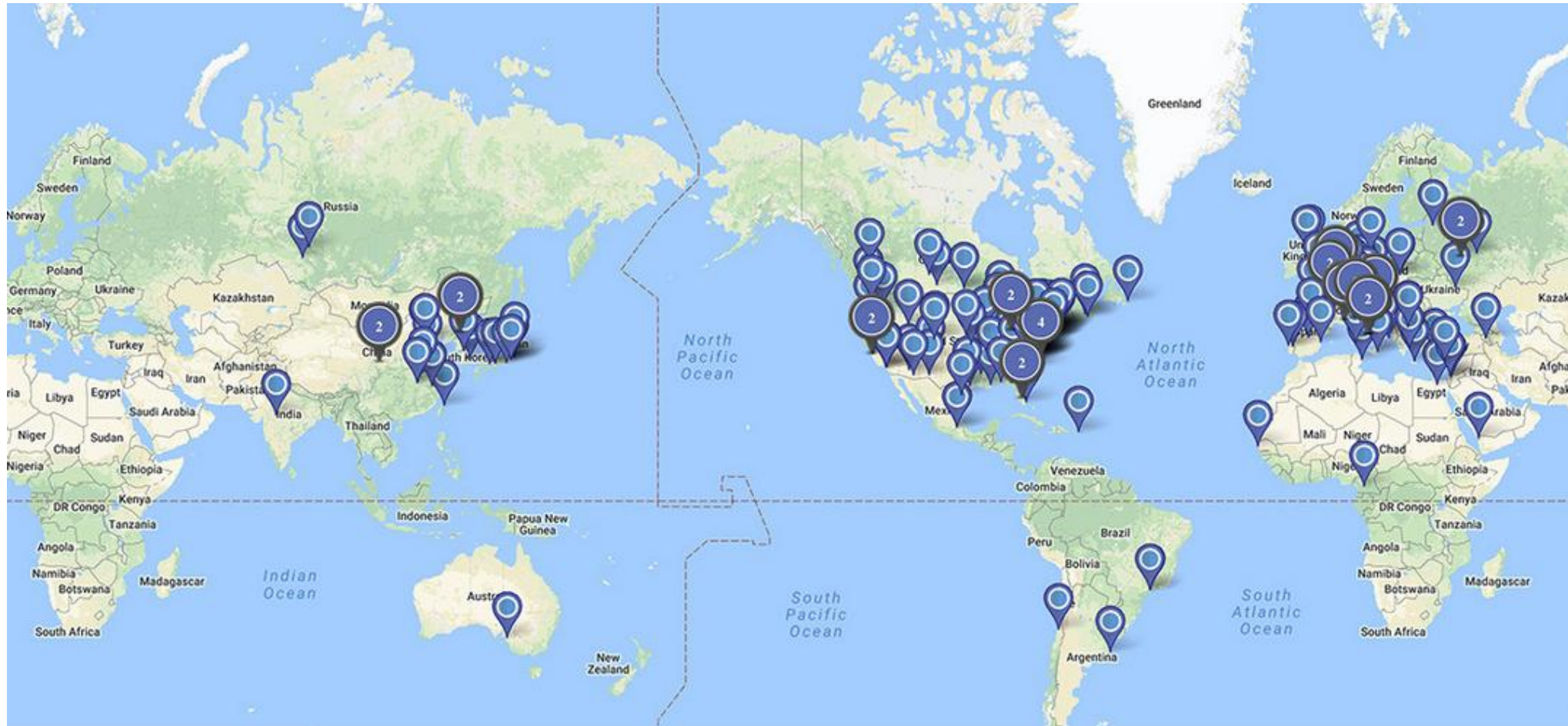
- The 12 GeV program: 150 approved experiments (more than 6500 days).
- The user community is dedicated to realizing the full scientific potential of a world class CEBAF accelerator (Recommendation 1 of the LRP)

Topic	Hall A	Hall B	Hall C	Hall D	Other	Total
The Hadron spectra as probes of QCD (GlueX and heavy baryon and meson spectroscopy)		<u>6</u>	<u>1</u>	<u>7</u>		<u>14</u>
The transverse structure of the hadrons (Elastic and transition Form Factors)	<u>8</u>	<u>6</u>	<u>8</u>	<u>1</u>		<u>23</u>
The longitudinal structure of the hadrons (Unpolarized and polarized parton distribution functions)	<u>5</u>	<u>6</u>	<u>8</u>	<u>1</u>		<u>20</u>
The 3D structure of the hadrons (Generalized Parton Distributions and Transverse Momentum Distributions)	<u>10</u>	<u>17</u>	<u>12</u>			<u>39</u>
Hadrons and cold nuclear matter (Medium modification of the nucleons, quark hadronization, N-N correlations, hypernuclear spectroscopy, few-body experiments)	<u>11</u>	<u>15</u>	<u>16</u>	<u>4</u>		<u>46</u>
Low-energy tests of the Standard Model and Fundamental Symmetries	<u>3</u>	<u>3</u>	<u>1</u>	<u>1</u>		<u>8</u>
Total	<u>37</u>	<u>53</u>	<u>46</u>	<u>14</u>	<u>0</u>	<u>150</u>

The 2025 run of CEBAF achieved the highest reliability (86.6%) since the 12 GeV upgrade.

The Jefferson Lab user community:

- more than 1700 users in 2025
- PhD Theses: 33 in 2024



Potential Challenges

- The 12 GeV science program requires:
 - resources for machine operations
 - robust support of research through university grants (NSF, DOE)
- global collaboration and open international access to the facility and data is paramount
- concern about resource availability for incremental upgrades (SoLID, positron beam, 22 GeV upgrade, ...).

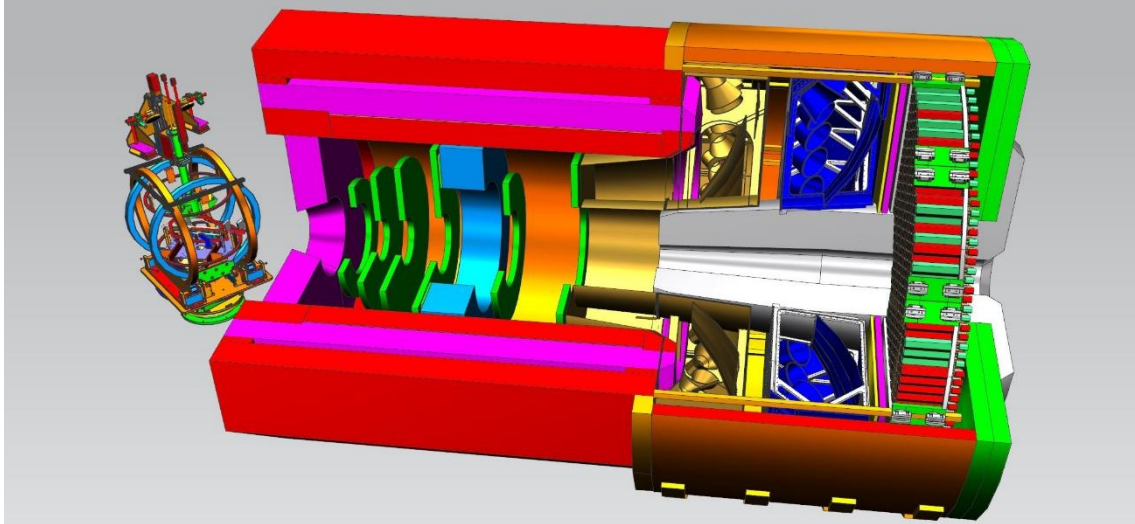
Report of the 2026 Meeting of the

JLUO Board of Directors and Jefferson Lab Management:

https://wiki.jlab.org/cugwiki/images/3/33/JLUO_Jan2026_annual_meeting_report.pdf

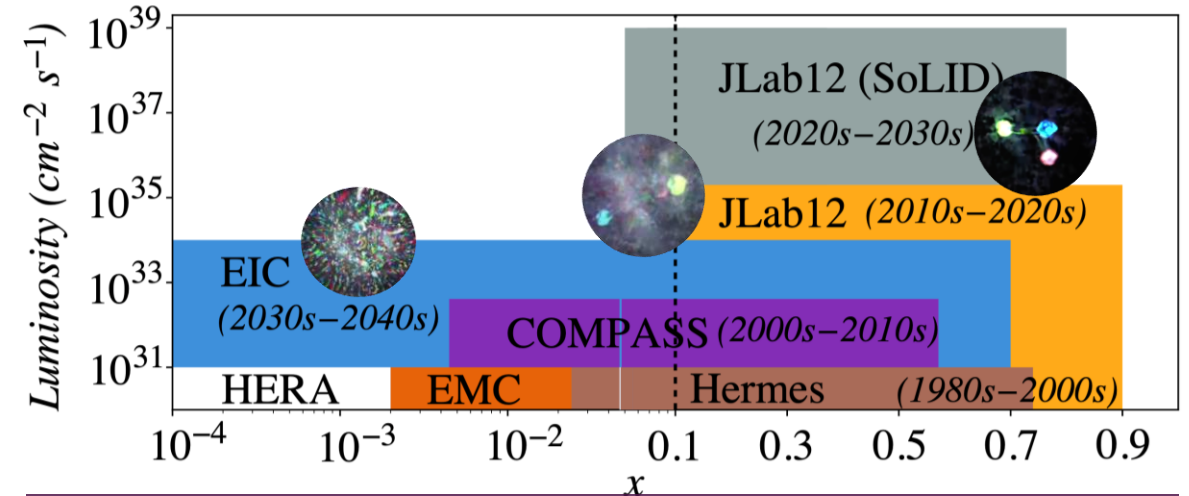
SoLID @ Jefferson Lab: QCD Intensity FRONTIER

Nucleon spin, mass and BSM search experiments. Precision measurements of small cross sections and asymmetries. Critical: high luminosity (10^{37} - 10^{39} $\text{cm}^{-2}\text{s}^{-1}$) and large acceptance



Solenoidal Large Intensity Device (SoLID)

- Precision 3D imaging of the nucleon in the valence region (GPDs, TMDs). Unique, critical to NP science mission but complementary to EIC.
- Exploring the origin of the proton mass and confining color forces. Mass and scalar energy distributions in the proton. Unique, critical to NP science, but complementary to EIC.
- Search beyond the Standard Model of Particle Physics. Unique and complementary to Moller



Luminosity Frontier in the Valence Region

- DOE/JLab supported pre-R&D activities on cutting-edge technologies.
- Enhanced credibility of the design with greatly reduced cost/schedule risks
- Scientific excellence and students training ground with a growing impactful science portfolio