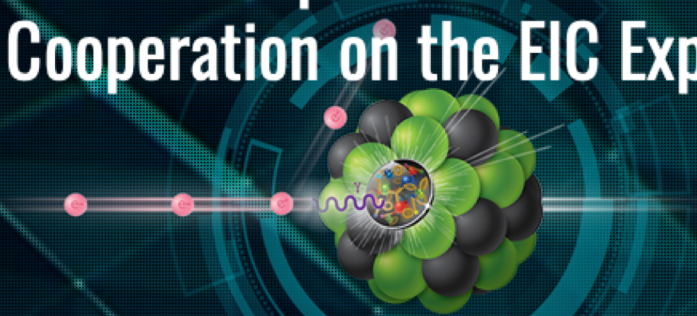


Expressions of Interest

Call for Expressions of Interest for Potential Cooperation on the EIC Experimental Program



EOI FAQ: Can institutions submit more than one EOI?

Institutions may very well consist of different groups that have more than one interest. However, individual institutions should not submit more than one EOI, and that EOI should be all-inclusive. **Institutions may also join other groups and/or consortia in their EOI, with cross-referencing to the individual institution EOI.**

Expression of Interest for EIC Software

Software Consortium

- EIC collaborations will determine for themselves what they do for software, but that will likely include **common software**.

Community-wide effort leveraging everyone's experience

- define requirements for greenfield EIC Software
 - **Software components** Simulation, reconstruction, physics analyses, streaming readout, online monitoring etc.
- work together on **common software projects** based on these requirements
 - **Examples for common software** MCEGs, DD4hep, Geant4, ACTS, Gaudi, JANA2, ROOT, Jupyter
 - **Emerging technologies** Artificial Intelligence and Quantum Computing

Timeline

July 15

Announcement

September 3

Meeting on Common Projects

Please [register](#) for updates.

September –
October

Cooperatively edit Expression of Interest for Software

Based on input of each group.

November 1

Deadline for submission

Next steps: Please prepare up to three slides on these questions

Software Needs

Requirements What software needs for EIC Software would you like to highlight now, in a few years, and for the completion of the EIC project?

Technologies & Techniques What software technologies and techniques should be considered for the EIC?

Meeting Software Needs

What resources can your group contribute?

A word about Jefferson Lab

Thomas Jefferson National Accelerator Facility is a U.S. Department of Energy Office of Science national laboratory.

Jefferson Lab's unique and exciting mission is to expand humankind's knowledge of the universe by **studying the fundamental building blocks of matter** within the nucleus: subatomic particles known as **quarks and gluons**.



More than 1,500 nuclear physicists worldwide come to Jefferson Lab to conduct and collaborate on research.

Jefferson Lab's role in the Expression of Interest for Software

EIC Computing coordinated by Graham Heyes (JLAB) and Jerome Lauret (BNL)

EIC Software



Emphasizes the close connection of EIC Science to 12 GeV CEBAF science program

Coordinating role for EIC Software in close collaboration with BNL

- EIC Software Consortium (ESC), NAS study, EICUG SWG

Strong involvement in Yellow Report Initiative: EIC Software Collection **ESCalate**



Experimental **Physics Software** and **Computing Infrastructure**

6 experimental physicists and computer scientists led by David Lawrence

JANA 2 framework development

- C++ event processing framework
- **factory model** on demand interface, user-centered design
- multi-threaded with > 10 years experience
- **plugin support** provide mechanism for many physicists to contribute, multi-threading external to contributed code (parallelizer)

Streaming Readout

- Environment for **Real-time Streaming Acquisition and Processing (ERSAP)**
- hardware/software system that will process unbounded streams of continuous data at scale over distributed heterogeneous resources in (near) real-time
- currently tested at CLAS12

Artificial Intelligence

- dynamic control/calibration of experimental detector systems
- online data quality monitoring
- heterogeneous hardware support in reconstruction