EPIC Computing and Software News

Welcome to the **EPIC Computing and Software** WG!

Why have we merged the EPIC CompSW and SimQA WGs:

- Overlap in topics between the WGs.
- Our goal of not separating software development from software use and support. This is motivated by:
  - Lessons learned from successful scientific software projects.
  - The EIC Software: Statement of Principles:

> 8 **We will provide a production-ready software stack throughout the development:**
>
> - We will not separate software development from software use and support.

Priorities for 2023

Based on WG discussions.

Priorities for the working group itself: Next Priorities

- Build a large and active working group with shared responsibilities and leadership
- Portal to get starting with using simulations and analysis as well as software development

Priorities for simulations and analysis: Next Priorities

- Reconstruction for full integrated detector for holistic understanding of the detector and its capabilities
  - Including PID and backgrounds
  - Enforcing modularity for clear separation of development of reconstruction algorithms and development of the framework and its services
- Reproducible workflows for simulation and analysis
  - Building up on the work on continuous integration with tests and benchmarks
  - Start including handling of metadata (e.g., conditions database)
- Simulations of eA in addition to ep
- Simulations of streaming readout

Priorities to advance our science:

- Start incorporating AI/ML methods and approaches in our software stack
- Use heterogeneous nodes at BNL, Jefferson Lab, and other facilities as testbeds for start rolling out solutions for heterogeneous computing challenges
- Work with the collaborations towards fully reproducible, re-usable, and re-interpretable analyses as a collaboration standard

Priorities for software development:

- Debugging in containers
- Support Jupyter notebooks for analyses through documentation and examples

Next Simulation Campaign and Related Task Forces

- **Next simulation campaign**:
  - **Target date**: End of March.
  - **Goal**: Improved software stack for the reconstruction, including benchmarks.

- **Task forces** to reach our goal:
  - **Clustering**
  - **Jet Reconstruction**
  - **PID**
  - **Tracking**
  - **EICRecon** for urgent fixes to the reconstruction software stack
  - **Modular Reconstruction** for preparation of the new reconstruction software stack with clear separation:
    - Framework and its services (driven by computing needs)
    - Reconstruction algorithms (driven by physics needs)
  - **Simulation Campaign Preparation**

- Each task force will be responsible for leading the effort for a particular topic with the following goals:
  - The development is accessible to the whole collaboration in our main repository.
  - We can evaluate the reconstruction quality using a set of well-defined plots that we can easily reproduce.