1 S^2I^2-HEP Strategic Areas of Focus and Priorities

The primary goal of the S^2I^2-HEP conceptualization project is to prepare a Strategic Plan for a potential NSF Scientific Software Innovation Institute (S^2I^2) to develop software for experiments taking data in the "High-Luminosity Large Hadron Collider" (HL-LHC) era in the 2020s. We have been working with the HEP Software Foundation to prepare a larger HEP Community White Paper (CWP) describing a global roadmap for HEP Software and Computing R&D for the 2020s.

The S^2I^2-HEP Strategic Plan should identify the specific areas of focus and initial priorities for an NSF-funded Institute funded in the U.S. universities, as well as the corresponding challenges and why addressing those challenges will be transformative. Equally importantly, the Strategic Plan should identify areas where the Institute will not lead efforts, and those where it might participate with lower priority.

Questions to identify priority focus areas relevant for a U.S. university-based Institute include:

1. **Impact - Physics:** Will efforts in this area enable new approaches to computing and software that maximize, and could potentially radically extend, the physics reach of the detectors?

2. **Impact - Resources:** Will efforts in this area achieve required improvements in software efficiency, scalability and performance and make use of the advances in CPU, storage and network technologies?

3. **Impact - Sustainability:** Will efforts in this area guarantee the long term sustainability of the software through the lifetime of the HL-LHC?

4. **Interest/Expertise:** Does the U.S. university community have a strong interest and expertise in the area?

5. **Leadership:** Are the proposed focus areas complementary to efforts funded by the US-LHC Ops programs, DOE or international entities?

6. **Value:** Is there potential to provide value to more than one LHC experiment and to the wider HEP community?

7. **Research/Innovation:** Are there opportunities for combining research and innovation as part of partnerships between the HEP and Computer Science communities?

2 S^2I^2-HEP Organisation and Processes

Questions regarding the organisation of the institute and its processes include:

1. **Goals:** What are the goals of the Institute?
2. **Interactions:** Who are the primary clients/beneficiaries of the Institute? How are their interests represented? How can the Institute align its priorities with those of the LHC experiments?
3. **Operations:** How does the Institute execute its plan with the resources it directly controls? How does the Institute leverage and collaborate with other organizations? How does the Institute maintain transparency?
4. **Metrics:** How is the impact of the Institute evaluated? And by whom?
5. **Evolution:** What are the processes by which the Institutes areas of focus and activities evolve?