sPHENIX Software & Computing Review
May 16th-17th, 2022
Charges to the Review Committee

The sPHENIX detector was designed to facilitate large acceptance, ultra-high rate measurements of fully reconstructed jets and high resolution spectroscopy of Upsilon states at the Relativistic Heavy Ion Collider (RHIC) at Brookhaven National Laboratory (BNL). The experiment is aimed at addressing scientific questions prioritized in the 2015 NSAC Long Range Plan as required to exploit the scientific potential afforded by the RHIC complex prior to the construction of the Electron Ion Collider (EIC).

sPHENIX is on schedule to take the first data of its planned 3-year data campaign in US Fiscal Year 2023 hence, this would be the last review that would happen before detector commissioning and data taking. The sPHENIX Software and Computing 3rd review, held in March 2021, leaded to several major recommendations including revisiting the computing plan incorporating a clearer timeline of data-taking and production campaigns, a revisit of the workforce needed to address the required critical issues and a revisit of what is needed for both computing hardware and software components under budget constraints. The findings, coupled with a timeframe reaching operation, led to a follow-up "readiness" review (held July 19th 2021) which identified recurrent gaps. As commissioning is approaching, this review and the 4th full review to date, aims at closing the information gaps and/or providing an opportunity for the collaboration or the review committee to provide explicit suggestions to mitigate the remaining issues if any.

In this review, the committee is charged to review the progress in the following areas:

- Considering the budget and hardware purchase scenarii, how has the computing plan been altered? If the plan was not revised, what are the missing elements of information required to complete it and when should the committee expect a final plan?

- Has the data processing and run plan been finalized?

- Considering the previous review identified gaps between the purchase plan and the collaboration's desired resources, what are the alternative scenarios considered by the collaboration for data taking and/or data processing to cope with those gaps? What are their quantitative or qualitative Physics impacts on the program of those scenarios?
    - If no alternatives are presented, the committee is asked to provide their comments and suggestions on possible processing plans.

- The committee strongly recommended that all requirements converge within 15% of the values necessary to finalize the hardware provisioning and scheduling plan. What is the collaboration's confidence in their current estimates at this time? Does it fall within the past recommendation and if so, has the final purchase (in concurrence with the facility) been initiated? If not, what additional insight would the MDC2 provide and when would the requirements be finalized?

- Are technologies for disk storage finalized and the “kind” of storage (cache/volatile, permanent) be clarified? Has access pattern and I/O performance for sPHENIX workflows been evaluated?

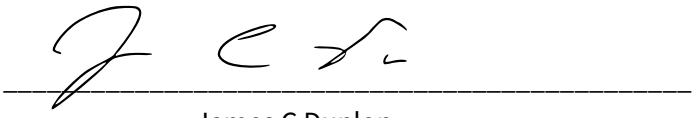
- What is the current memory requirement (GB/core) baseline? Is it “frozen”? Has it changed since the December 2021 review?

- Has the scalability of the Condition Database component been evaluated? Is its payload well understood and a plan for proper provisioning of servers/service established?

- Are the critical components identified in the previous reviews implemented and ready and what are the status of the corresponding services?

- The committee is asked to comment on the facility's proposed cost for hardware procurement and compare it to community projects of similar scale. Are the costs as expected and are there any recommendations to optimize hardware procurement and maximal capacity (CPU, storage) delivery?

A report should be submitted to my office by close of business on June 1, 2022. I very much appreciate your willingness to lend your time and expertise in this important process and look forward to receiving your assessment.



James C Dunlop
Associate Chair for Nuclear Physics, Physics Department
Brookhaven National Laboratory