

Charge for PAC Review of PHENIX and STAR Decadal Plans

In response to a December 2009 charge from the ALD for Nuclear and Particle Physics at BNL, the PHENIX and STAR Collaborations have now completed new Decadal Plans outlining the science goals, measurement programs and upgrades needed to pursue them at RHIC through roughly the 2020 time period. The plans can be accessed at the following web site: <http://www.bnl.gov/npp/> (click about halfway down the page on the links for “Decadal Planning for RHIC Experiments”). The PAC heard presentations on progress toward these plans at its June 2010 meeting.

I would like you now to provide verbal and written feedback on the full Plans, with emphasis on the following questions:

- 1) Are the science goals in each Plan well-posed and compelling? Are there important questions addressable with RHIC’s capabilities (perhaps after minor upgrades) that you find missing from the Collaboration’s list?
- 2) How well do the suggested measurement programs answer the highlighted science questions? Are there additional simulations or theoretical work that would strengthen the case for making those measurements?
- 3) Are the suggested measurement techniques and upgrades essential for answering these questions? (For example, can some questions be adequately answered by high- p_T hadron detection without full jet reconstruction?)
- 4) Is the complementarity of the proposed RHIC program and of LHC heavy-ion capabilities clearly defined and convincing? If not, what would it take to clarify this complementarity?
- 5) Do the measurements proposed with polarized proton beams constitute a compelling extension of the RHIC Spin Program, achievable with anticipated integrated luminosities?
- 6) Do the plans and proposed detector upgrades provide the basis for a useful transition of each Collaboration to an era when substantial beam time would be devoted to ep and eA collisions at an eRHIC?
- 7) How would you rank the priority (high, medium or low) of each proposed upgrade, taking into account both scientific and technical merit and rough estimates of cost?
- 8) Does the suite of proposed measurements justify RHIC operations beyond about 2017, assuming RHIC-II luminosities? (By that year, each of the upgrades launched during the Midterm Plan era should have had at least three years of operations to bear fruit.) If you find the case not yet compelling, how could it be strengthened?

The feedback you provide will be critical in helping the Collaborations to iterate on their plans and in helping RHIC management, in consultation with the user community, to develop an optimal strategy for RHIC's future in preparation for the next Long Range Planning process in the U.S. Nuclear Physics community. I plan to convene a user workshop during 2011 to try to reach consensus on such a strategy, informed in part by your feedback on the Decadal Plans.