

## PREPARING FOR THE NUCLEAR PHYSICS LONG RANGE PLAN

From: The 12 GeV White Paper Steering Committee

To: Workshop Organizers  
Workshop Participants  
All CEBAF Users  
All JLab Scientific Staff  
Users Group Board of Directors  
JLab Director's Council  
PAC 18

The next Nuclear Science Advisory Committee (NSAC) Long Range Plan will be launched this Fall. It is crucial for realizing our goal of expanding the physics reach of CEBAF at Jefferson Lab with 12 GeV beams and new experimental equipment that our Upgrade be a high priority construction item in that Plan.

The Lab and the Users Group have appointed our Committee to produce a White Paper (currently envisioned as a several hundred page document) which lays out the compelling scientific case for the 12 GeV PREPARING FOR THE NUCLEAR PHYSICS LONG RANGE PLAN upgrade AND demonstrates that its laudable scientific goals can be met by describing both the design for the accelerator and for at least certain key experiments or experimental programs that can pass rigorous peer review. The Lab-appointed Committee members are Larry Cardman, Nathan Isgur, and Christoph Leemann; the User Group-appointed members are Rolf Ent, Jean-Marc Laget, Curtis Meyer, and Zein-Eddine Meziani.

Although the time is short, we are very fortunate that a great deal of very solid work has already been done over the last six years beginning with the April 1994 Workshop "CEBAF at Higher Energies". Most recently, the January User Workshop was devoted to delineating the 12 GeV program for the existing experimental Halls. It commissioned five follow-on Working Groups to develop crisp scientific cases and identify possible key experiments or key experimental programs in five target areas focused on these Halls. These Working Groups and the Workshops they subsequently sponsored are:

**07-10 March**    *Hadrons in the Nuclear Medium*

organizers: W. Boeglin, M.Sargsian, M.Strikman  
site: Florida International University

**30 March  
-01 April**    *Valence Structure Functions ("HIX2000 Workshop")*

organizers: J. P. Chen, K. Kumar, W. Melnitchouk,  
Z. -E. Meziani, G. Petratos, P. Souder  
site: Temple University

- 03 April**      *Threshold Charm Production*  
organizers: Eugene Chudakov, Jean-Marc Laget  
site: Jefferson Lab
- 13-15 April**      *Exclusive Reactions and Skewed Parton Distributions*  
organizers: Volker Burkert and Paul Stoler  
site: Jefferson Lab
- 17-18 April**      *Quark-Hadron Duality in Structure and Fragmentation Functions*  
organizers: W. Melnitchouk, C.E. Keppel, J.L. Goity, R. Ent  
site: Jefferson Lab

(You can find out more about these Working Groups at the 12 GeV web site:

[http://www.jlab.org/div\\_dept/physics\\_division/GeV.html](http://www.jlab.org/div_dept/physics_division/GeV.html)

or by contacting a Working Group organizer). Prior to and in parallel to this effort, the new Hall D Collaboration produced a design for a new meson photoproduction facility designed to discover gluonic excitations. Their design underwent a rigorous review in December by a distinguished external committee; they emerged from the review with very high praise for both their physics goals and their experimental design. (You can find the latest information on the Hall D Collaboration at their web site

<http://dustbunny.physics.indiana.edu/HallD/>

or by contacting a collaboration member.)

THE MAIN PURPOSE OF THIS MESSAGE IS TO LAY OUT FOR EVERYONE INVOLVED THE PLAN FOR THE NEXT FIVE VERY DEMANDING MONTHS AND BEYOND, to emphasize the jobs that remain to be done by the Working Groups and the Hall D Collaboration, and to stress the importance of all Users attending the 21-23 June Users Meeting. At that meeting, the five Working Groups and the Hall D Collaboration will report their conclusions and everyone will have an opportunity to express opinions on the emerging White Paper and on the selection of the key experiments or programs that are ready to pass serious review. (Recall the audience for the White Paper is first the approximately 45 members of the Long Range Planning group representing a nuclear physics community that is roughly equally divided between our subfield, nuclear structure physics, and relativistic heavy ion physics.) Of course one of the great strengths of the 12 GeV Upgrade is that it is NOT very narrowly focused, and the body of the White Paper will be devoted to this broad program (including the continuation of "4 GeV running" as appropriate). Thus the Working Groups and the Hall D Collaboration will have major responsibilities for presenting the crisp physics cases and descriptions of plausible experimental programs in their respective areas of the body of the document. Nevertheless, to have our \$100M Upgrade as a flagship construction project for the next Long Range Plan, we will have to highlight several "burning issues" with which the whole

nuclear physics community (and preferably an even wider community of scientists) can identify. Thus the Steering Committee foresees a White Paper with a 25 page Highlights Section that focuses on a few key issues and experiments (or programs) selected from the main body of the White Paper. These Highlights must be exciting enough to justify the Upgrade essentially on their own and the proposed accelerator and highlighted experiments must **SOLIDLY DEMONSTRATE** that the Upgrade can accomplish the physics goals claimed. Thus the key experiments (or programs) must be of PAC-approved quality.

Given this, PAC 18 has set aside two days (Friday the 14th and Saturday the 15th of July preceding the week of the PAC meeting) to review our plans, with a special emphasis on a PAC-level review of the proposed Highlighted experiments (or programs).

With these fixed dates in view, the Steering Committee has set the following very demanding schedule for the next five months:

### **to 12 June:**

The Steering Committee interacts with the five Working Groups, the Hall D Collaboration, and the existing Halls to prepare a draft version of the roughly 200 pages of physics (including detector designs) for the main body of the White Paper. (The roughly 50 pages of accelerator design will be produced by Christoph Leemann's Accelerator Division.) During this period the Working Groups and the Hall D Collaboration will also develop PAC-level proposals for any key experiments or programs that they wish to propose be pulled from the main body of the White Paper for the Highlights Section.

### **12 June:**

Based on the draft of the main body and the status of preparations for proposals for the Highlights (see below to appreciate how well-developed such preparations will have to be to qualify), the Steering Committee will finalize the agenda for the Users Meeting that will have presentations AND DISCUSSION (with adequate time allocated 50-50 to each) on the body of the White Paper and on the candidate Highlights.

### **21-23 June:**

The Users meeting. There will be open discussion on all proposals selected for presentation, on the instrumentation upgrades for each existing Hall, and on the proposed Hall D photoproduction facility. Input from our whole community on both the body of the White Paper and the Highlights is important. In particular, it seems likely that many more Highlights will be proposed than can be accommodated.

### **26 June:**

The Steering Committee will announce the agenda for the 14-15 July PAC meeting which will include presentations on the body of the White Paper and selected options for Highlights. Those experiments or experimental programs selected for presentation as Highlighted options based on the discussions at the User Meeting will be informed that they should complete the development of their proposal presentations into full PAC proposals based on the feedback received in the next three weeks for submission to PAC 18.

### **05 July:**

Proposals of the candidate Highlight options due at the User Liaison Office for distribution to PAC 18 and review as usual by the JLab TAC. Also due at this time for review by the PAC are the instrumentation proposals for the White Paper.

### **14-15 July:**

12 GeV Review by PAC 18.

### **mid-July to mid-August:**

White Paper prepared by the Steering Committee with the support of the Working Groups and the Hall D Collaboration. Additional feedback from the community on all aspects of the White Paper (Highlights, the main body of text, and the instrumentation proposals) will be sought. PAC-approved experimental proposals and programs and detailed equipment plans may be included in the White Paper as Appendices to substantiate references made in the text and Highlights section.

### **14 August to 28 August:**

Draft White Paper circulated to our community and selected external readers for comments.

### **early September:**

White Paper published.

### **Fall 2000:**

Long Range Plan Town Meetings commence. JLab Users actively involved in presenting the compelling physics case of the 12 GeV Upgrade as defined in the White Paper, and in shaping the plan for the future of the U.S. Nuclear Physics program.

If you have any questions or comments about this plan, please contact one of us.

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