Brian Quinn
Carnegie Mellon University
2011-2012 projects/plans

Our activities will focus on the design of HCal, including testing, simulation, design implementation, and cost estimates.

Vahe Mamyan has done extensive simulation work with Geant4 aimed at understanding the effects of different design parameters on the performance of the detector. Part of this work includes study of possible methods of readout and analysis to determine how optimal performance can be obtained on time resolution and spatial resolution.

A series of bench tests have been carried out to make sure relevant parameters are well understood, properly implemented in simulation, and give results consistent with simulation predictions. These include cosmic-ray studies of timing and attenuation with Elgen wave-length shifter; laser/photo-diode studies of attenuation and light-loss; cosmic-ray studies of light production and transport in a Compass calorimeter block (using cosmic rays transverse to the detector); spectro-photometric studies of the wavelength-shifter in the Compass block; and preparation and spectro-photometric study of known-thickness Coumarin-535 samples. Similar bench tests are on-going (with a faster PMT replacing the standard tube on a Compass block) and are expected to continue. The goal of these studies is to make sure real-world performance is reflected in the Geant4 simulation work so the best possible predictions can be made of the response of the detectors in data-taking conditions. Such bench tests are expected to continue, to ensure that actual behavior of detector elements is well understood so informed decisions can be reflected in choices relating to scintillator, light-guides and PMTs.

We expect to upgrade our data-acquisition capabilities this year to permit multi-channel readout of TDC times, ADC charge integrals, and high-resolution digitizers. In addition to allowing us to make bench tests more easily, this will allow us to directly compare the quality of time and charge information obtained with digitizers vs more conventional time and charge readout. This will allow us to anticipate any trade-offs involved in choice of front end electronics.

Design work is continuing on CMU contributions to the construction of the HCal blocks, with consideration being given to design of an adiabatic transition from the flat Elgen light-guide to the PMT and to mounting of CMU's 2262 PMT's and their bases/housings.

In the past Vahe Mamyan has also made significant contributions to tracking in the GEM detectors. Other such contributions may also be made as the need arises.

Mahbub Khandaker and Vina Punjabi
Norfolk State University
2011-2012 projects/plans

The activities of the PI's from Norfolk State University will focus on the design of the Coordinate Detector (CDET) and the Electron Calorimeter (ECAL), including construction, testing, simulation, and cost estimates for the CDET.

We were part of the initial design considerations for the CDET that was carried out primarily by Adam Sarty and his students from Saint Mary's University. In this conceptual design the CDET was to be constructed as a two-layer scintillating fiber tracker with 1500 2-mm fibers in each layer.

The conceptual design considerations have evolved in the recent past and currently we are planning to build it with scintillator strips of dimensions $0.3 \times 3.0 \times 100$ cm^3 and wavelength shifting fibers attached along the length of the strips. The detector will consist of three vertical layers of the scintillators 3-4 m high together with a $\sim$15 cm thick plastic absorber in front of it for stopping the low energy particles.

The outputs from the CDET will be detected by 16-channel multi-anode PMTs. 634 Hamamatsu H8711 and H6568_R5900-M16 PMTs have been donated by CDF at Fermilab together with CAEN high voltage supplies and crates. We have retrieved these PMTs and they are now at JLab. A setup to test individual channels of all these PMTs are being put in place currently. Starting towards the end of May, 2012 the testing phase will start with the help of Adam Sarty's students and it will be completed by this summer.

An initial cost estimate of $\sim$\$218k for the CDET has been done, including extruded scintillators from Fermilab, WLS fibers, frontend electronics and DAQ. Overall management for the different parts of the CDET project including preparation of a technical document for submission to JLab management are currently underway.

(The section on ECAL activities/plans will be added here later.)

Participation in the SBS experiments by B.Wojtsekhowski (Hall A TJNAF).

I am anticipating continuing participation in the SBS projects as a spokesperson-contact for several approved experiments.
For the SBS projects (per Project Management Plan) I am serving as the leading scientist.
The current Hall A experimental schedule has a number of experiments based
on the SBS/BB pair, including three approved high momentum transfer form factor experiments, an approved SIDIS experiment, an additional GEn form factor experiment which is prepared for submission to PAC39, and two others, which require the BB magnet and the detectors from the SBS program, A1n and Tritium. As a result, within the Hall A collaboration there is significant support for SBS/BB setup preparation.
The Hall A commitments (which include my research time) are presented in the Research Management Plan. The projected Hall A contribution (scientific staff) is 4.9 FTE-years from staff and 7 FTE-years from postdocs for the three-four years of SBS preparation.