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Subject: HYSPEC News 04-1

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Status:

Hello Folks,

It is time to bring you up to date on progress on the HYSPEC direct geometry instrument approved for construction at the SNS.

IDT MEETING AT ACNS:

Before giving more details about the progress I would like to announce that during the upcoming ACNS meeting there will be a breakout session (W3-A10) on June 9, Wed. PM, which will serve as an IDT meeting. Check out the abstract at:

(<http://www.ncnr.nist.gov/staff/jeff/ACNS2004program.html>). There will be lots of demands on your time during the several breakout sessions, but please try to attend the one for HYSPEC to learn the latest and provide some input.

PERSONNEL:

Instrument scientist

As announced in the last Newsmail, the instrument scientist for HYSPEC, Mark Hagen, came on board last month. He is an SNS employee responsible for building HYSPEC and will be stationed at Brookhaven for the first two years. This will allow him to work with our design team and come up to speed with many of the challenges of HYSPEC. (He will be earning many frequent flyer miles because of the many trips he will make to SNS.) It is a pleasure to have

Mark on board and his presence has already been demonstrated with the increased integration into the entire SNS project.

Project Engineer:

We have also hired an engineer, Bill Leonhardt, to work with the BNL design team to help with design and cost estimates of the monochromator drum and the detector area, the components of HYSPEC that are unique and will be the IDT's major responsibility. He has been a senior project engineer at Brookhaven for over 25 years, most recently affiliated with STAR, one of the large detectors at BNL's RHIC facility. He has had extensive experience in project engineering and management, mechanical design, thermal and stress analysis, and pressure vessel technology. He is a great addition to our team and is approaching HYSPEC with his usual enthusiasm!

Post-Doctoral Fellow:

As part of the HYSPEC project there is money set aside for "program development", which was encouraged by DOE. The purpose of this is to develop a group of scientist who will make a career doing neutron scattering and will be the future users of the SNS. To this end, we are currently recruiting for a post-doc that will be stationed at BNL but will do neutron science at the various neutron facilities, with emphasis at learning spallation neutron source techniques. The job is posted on the BNL web site: <http://www.bnl.gov/HR/jobs/#Postdoctoral%20/%20Scientific%20Staff%20Positions>, position # MK2859. So, if any of you have exceptionally talented students looking for a position have him/her apply.

SNS ORGANIZATION:

HYSPEC is included among 5 instruments as part of one overall project called SING -SNS Instruments - Next Generation. These instruments are (expected completion dates):

- SNAP ( 2008) High pressure diffractometer
- SEQUOIA ( 2008) High resolution chopper spectrometer
- SCD (2009) Single crystal diffractometer
- NOMAD (2010) Disordered materials diffractometer
- HYSPEC (2011)

These instruments have been funded by DOE-BES as a MIE project (Major Item of Equipment) to the tune of \$64M. A Project Manager is in place, John Haines, and he reports to Ian Anderson, the Director of the Experimental Facilities Division.

HYSPEC PLACEMENT:

Last year at this time, we thought that HYSPEC was given beam line 14B, on the coupled cold moderator. Our design was based upon having the

instrument placed within the experimental floor. Since HYSPEC requires considerable space perpendicular to the beam line, it infringed upon the neighboring beam line, BL15. This was deemed workable since the BL 15 was tentatively assigned to the proposed Neutron Spin Echo (NSE) instrument, which is short, and snuggled in upstream of HYSPEC. Upon closer examination by SNS and the concern raised about magnetic field interference between HSYPEC and NSE, the SNS project asked us to look at other possibilities for locating HYSPEC. We prepared a document, which is on our web page, ([http://neutrons.phy.bnl.gov/CNS/hyspec\\_index.html](http://neutrons.phy.bnl.gov/CNS/hyspec_index.html) ) giving several options and the pros and cons of each one. The issue is not settled and discussions are continuing. This will be one item we will be discussing at the IDT meeting at ACNS and would like your opinion.

SHIELDING:

One of the design goals has been to achieve the highest possible signal-to-background ratio. Plans for reducing the beam-related background are now being developed. Since the SNS will be a 1.4 MW spallation source the moderator leakage spectra will have an energy range extending from  $10^{-11}$  to 1000MeV. Shielding the sample and detectors from the fast neutrons is a much bigger challenge than that for shielding at steady state reactors. The background reduction strategy for HYSPEC includes the use of a drum shield, a sapphire filter, a novel multi-rotor T0 chopper and/or a curved guide. Neutron transport (MCNPX) simulations are being performed to study various shielding materials that can be used for chopper discs and for the drum shield. At the IDT meeting the results of these calculations will be presented.

We look forward to seeing you at ACNS and listening to your comments and suggestions.

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