

## New BT-7 Double Focusing Triple-Axis Spectrometer

In the summer of 2003 the NIST Center for Neutron Research, as part of its modernization program, has begun to install a state-of-the-art triple-axis spectrometer on the BT-7 thermal beam port. A full description of this upgrade/instrument can be found at

[http://www.ncnr.nist.gov/instruments/bt7\\_new](http://www.ncnr.nist.gov/instruments/bt7_new)

Below are a few of the basic characteristics of this new spectrometer in order as they appear down the beam:-

- a) Pre-monochromator pyrolytic graphite (PG) filter.
- b) 10, 25, 50' or open collimation before the monochromator.
- c) Double focusing (20 x 20 cm) PG and Cu (220) monochromators.
  - a. These will be remotely interchangeable
  - b. Room is available for a third monochromator.
- d) A choice of 10, 25, 50' and open collimators, each 3.8 cm wide, before and after the sample position. Choice of radial collimators after the sample, for horizontal focusing purposes, or for diffraction purposes with the PSD included in the analyzer system.
- e) Room for a portable PG filter or a cooled filter like Be, spin flippers, He<sup>3</sup> polarizers.
- f) The sample table is be able to translate up to 35cm along the incident beam path and has the ability to move up and down on an elevator system. The usual sample rotation axis and goniometer tilts and translations are available.
- g) The analyzer and detector components will be housed in a single unit (see figure) and placed on air-pads to accommodate the weight of the well-shielded analyzer system. All detector collimations and detectors will be controlled remotely. All the electronics for this system will be on-board the analyzer system, and this secondary spectrometer will then be attached to the sample table and 2θ arm by a "quick" coupling hinge design so that other modular analyzer/detector systems developed in the future can be easily interchanged.
  - a. Max. 2theta at 14.7meV ~ 125°
- h) The first analyzer/detector unit to be installed will consist of
  - a. A 13 fingered horizontal focusing analyzer (totaling 26 x 15 cm)
  - b. A single detector or a PSD
  - c. A separate diffraction detector can be placed in front of the analyzer
  - d. Conventional (10, 25, 50' and open) and radial collimators
  - e. A set of stationary detectors behind the analyzer, to monitor the neutron flux entering the analyzer system. This feature will also allow the simultaneous measurement of the energy integrated scattering and the scattering at the energy transfer determined by the analyzer crystal.
- i) The spectrometer is designed with polarization analysis in mind, and the Heusler alloy monochromator and analyzer crystals have been purchased. The monochromator and analyzer mechanisms have not been designed or constructed.

