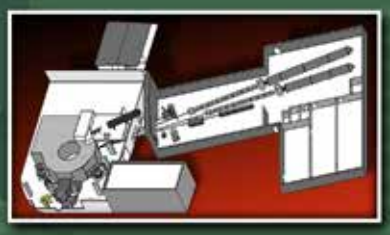
Instrument Fact Sheet

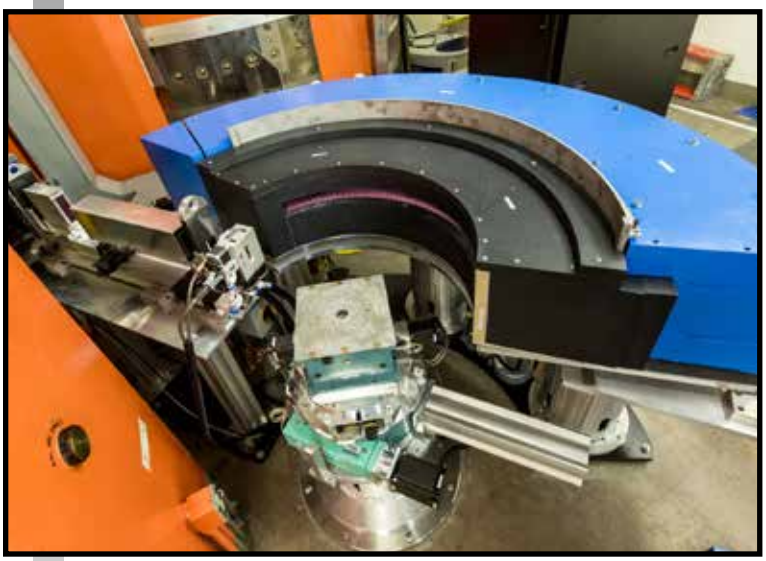
BEAM LINE **HB-2c**

HIGH FLUX ISOTOPE REACTOR



WAND – US/Japan Wide-Angle Neutron Diffractometer

The HFIR HB-2C WAND instrument was designed to provide two specialized data-collection capabilities: (1) fast measurements of medium-resolution powder-diffraction patterns and (2) measurements of diffuse scattering in single crystals. For these purposes, this instrument is equipped with a curved, one-dimensional ^{3}He position-sensitive detector covering 125º of the scattering angle with the focal distance of 71 cm. This enables measurements of single-crystal diffraction patterns in a short time over a wide range of the reciprocal space, as well as performance of time-resolved experiments for structural transformations having short time constants. The WAND detector (ORDELA 1410N) is a multianode type (624 anodes and a 0.2° pitch) ^{3}He gas counter specially designed for this instrument. This detector has an intrinsic angular resolution of 0.25° and a maximum counting rate per anode of 10^5 counts/s. The vertical focussing Ge monochromator provides high flux at the sample position which allows fast parametric measurements. The full range of HFIR's sample environment can be used, including cryofurnaces (4–800 K), furnaces (to 1800 K), cryostats (to 0.06 K), and cryomagnets (to 7 T). The high flux at the sample position also allows high pressure experiments with clamp cells up to 6 GPa.



Applications

WAND is ideal for the study of time-resolved phenomena and for the study of diffuse scattering in single crystals. Research performed at WAND includes studies of the growth of ferroelectric ice-XI, hole and charge ordering in colossal magnetoresistance materials, and studies of magnetic structures and correlations in low-dimensional magnetic systems and other magnetic materials.

WAND is operated in collaboration with the Japan Atomic Energy Research Institute under the US/Japan Cooperative Program on Neutron Scattering Research.

Specifications

Beam spectrum	Thermal
Monochromator	Vertically focused hot pressed Ge
Monochromator angle	$2\Theta_M = 51.5°$
Wavelength	λ = 1.5 Å (Ge 113) 0.95 Å (Ge 115)
Scattering angles	$0° < 2\Theta < 156°$
Collimations	Oscillating collimator radial before the detector
Detector	Multiwire (624 anodes, 0.2° pitch) He^3 curved PSD
Resolution	2 mm spatial resolution

Status: Available to users

For more information, contact

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