

# INSTRUMENT

# BEAM LINE 16B

SPALLATION NEUTRON SOURCE

# Fact Sheet



## VISION - CHEMICAL SPECTROMETER

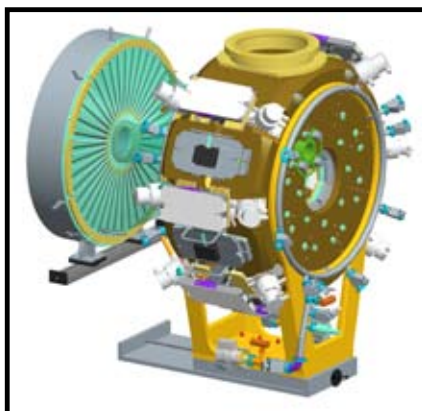
VISION is best thought of as the neutron analogue of an infrared-Raman spectrometer. It is optimized to characterize molecular vibrations in a wide range of crystalline and disordered materials over a broad energy range (<5 to >500 meV), while simultaneously recording structural changes using diffraction detectors in the backscattering position and at 90°. This inverted-geometry instrument offers enhanced performance by coupling a white beam of incident neutrons with two banks of eight analyzer modules, equipped

with double-focusing crystal arrays, that focus the desired neutrons on a small detector. This arrangement leads to improved signal noise, and the overall count rate in the inelastic signal is at least two orders of magnitude beyond that of similar spectrometers that are currently available.



Engineering model of VISION, including  $T_0$  chopper, bandwidth chopper, secondary spectrometer, and utility rooms.

Secondary spectrometer with detector and analyzer modules.



### APPLICATIONS

Leading-edge studies involving scientific disciplines such as nanotechnology, catalysis, biochemistry, geochemistry, and condensed/soft-matter science will all benefit from the enhanced performance and properties of VISION.

### SPECIFICATIONS

Moderator	Decoupled ambient water
Source-to- $T_0$ chopper distance	7.5 m
$T_0$ chopper-to-sample distance (primary flight path)	8.5 m
Sample-to-detector distance (secondary flight path)	0.7 m
Incident energy range	3.5–500 meV
Analyzer Bragg angle	45°
Total analyzer area (in 14 identical units)	0.5 m <sup>2</sup>
Energy resolution	Exceeds 1.5% (>5 meV) – 5% (<5 meV)
Elastic line width	90 meV
Annular diffraction detector	1.3–14 Å <sup>-1</sup>
Backscattering diffraction detector	1.5–30 Å <sup>-1</sup>
delta-d/d	0.001

Status:  
To be commissioned in 2012

### FOR MORE INFORMATION CONTACT

Principal Investigator: John Larese, [jzl@utk.edu](mailto:jzl@utk.edu), 865.974.3141

Instrument Scientist: Christoph Wildgruber, [wildgrubercu@ornl.gov](mailto:wildgrubercu@ornl.gov), 865.574.5378

[http://neutrons.ornl.gov/instrument\\_systems/beamline\\_16b\\_vision](http://neutrons.ornl.gov/instrument_systems/beamline_16b_vision)



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