

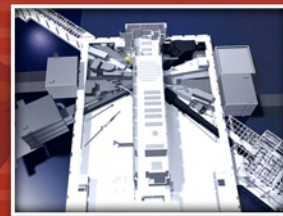
# INSTRUMENT

BEAM LINE

# 2

SPALLATION NEUTRON SOURCE

# Fact Sheet

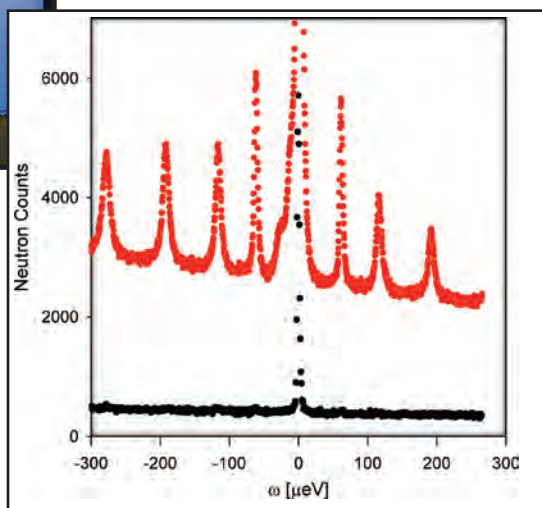


## BASIS – BACKSCATTERING SPECTROMETER

BASIS is designed to provide extremely high-energy resolution near the elastic peak, enabling studies of the diffusive dynamics of molecules on the atomic length scale (quasi-elastic neutron scattering). This instrument features very high flux and a dynamic range in energy transfer that is approximately five times greater than what is available on comparable instruments today. In addition, this instrument provides the unique capability of shifting the incident neutron bandwidth, enabling inelastic scattering to 18 meV of energy transfer, with a resolution of 0.1% of the energy transfer.



Backscattering spectrometer large evacuated final flight path.



Measurement of the quantum tunneling peaks in 4-methyl pyridine N-oxide (N-oxy gamma-picoline,  $C_6H_7NO$ ) at 4 K.

### APPLICATIONS

BASIS can be used to probe dynamic processes in various systems on the pico- to nanosecond time scale. It is well suited for probing diffusive and relaxational motions but can also be effectively used for studying some types of collective excitations in condensed matter. Applicable fields of study include, but are not limited to, biology, polymers, small molecules, complex fluids, magnetism, and materials science.

### SPECIFICATIONS

Si 111	
Elastic energy	2.08 meV
Bandwidth	$\pm 250 \mu\text{eV}$
Resolution (elastic)	$3.5 \mu\text{eV}$
Q range (elastic)	$0.2 \text{ \AA}^{-1} < Q < 2.0 \text{ \AA}^{-1}$
Solid angle	1.2 sr 2.4 sr (upgrade)

Si 311 (upgrade)	
Elastic energy	7.64 meV
Bandwidth	$\pm 1700 \mu\text{eV}$
Resolution (elastic)	$10 \mu\text{eV}$
Q range (elastic)	$0.38 \text{ \AA}^{-1} < Q < 3.8 \text{ \AA}^{-1}$
Solid angle	1.2 sr

Status: Operational

### FOR MORE INFORMATION, CONTACT

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[http://neutrons.ornl.gov/instrument\\_systems/beamline\\_02\\_basis](http://neutrons.ornl.gov/instrument_systems/beamline_02_basis)



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