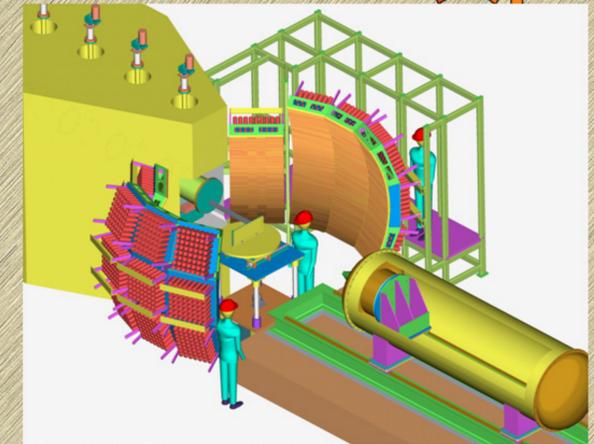
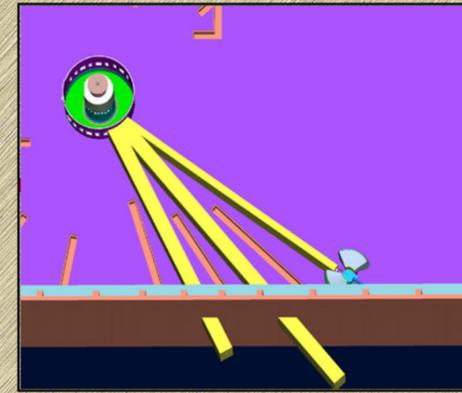


VULCAN - the Roman God of Fire and Metalworking

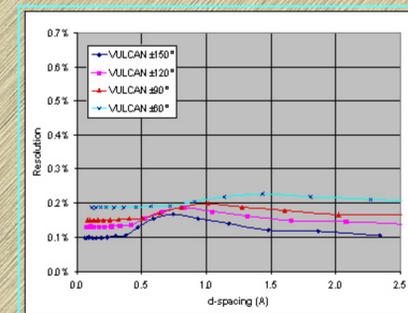
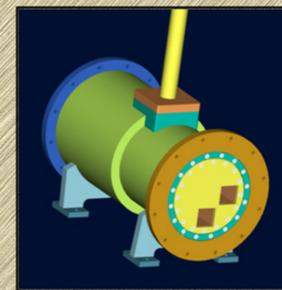


- **VULCAN is a dedicated diffractometer at the Spallation Neutron Source designed to tackle a broad range of problems in materials science and engineering. The primary use of this instrument is for stress-related studies, including mapping of residual stress distribution in components and the determination of deformation behaviors under applied load. Other uses include in-situ measurements of the kinetic behaviors in chemistry, stress, texture, and microstructure.**

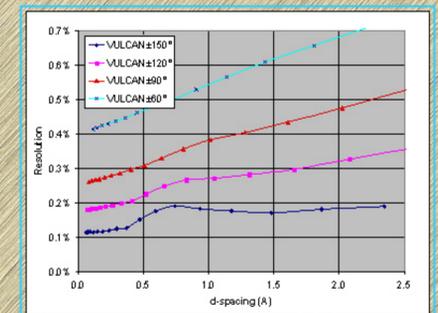


- **The performance requirements for VULCAN were determined by the user community at workshops**
 - rapid volumetric (3-dimensional) mapping with a sampling volume of 1 mm^3 and a measurement time of minutes
 - very high spatial resolution (0.1 mm) in one direction with a measurement time of minutes
 - ~20 well defined reflection for in-situ loading studies
 - ability to study kinetic behaviors in sub seconds
 - simultaneous characterization capabilities
 - e.g., SANS, dilatometry
 - load frame and furnace be an integrated part of the instrument

- **Features of neutron optical system**
 - extensive use of curved and straight guides
 - large detector coverage for rapid determination of stress tensor, texture, and chemistry
 - Simultaneous diffraction and SANS measurements
 - flexibility for intensity-resolution optimization

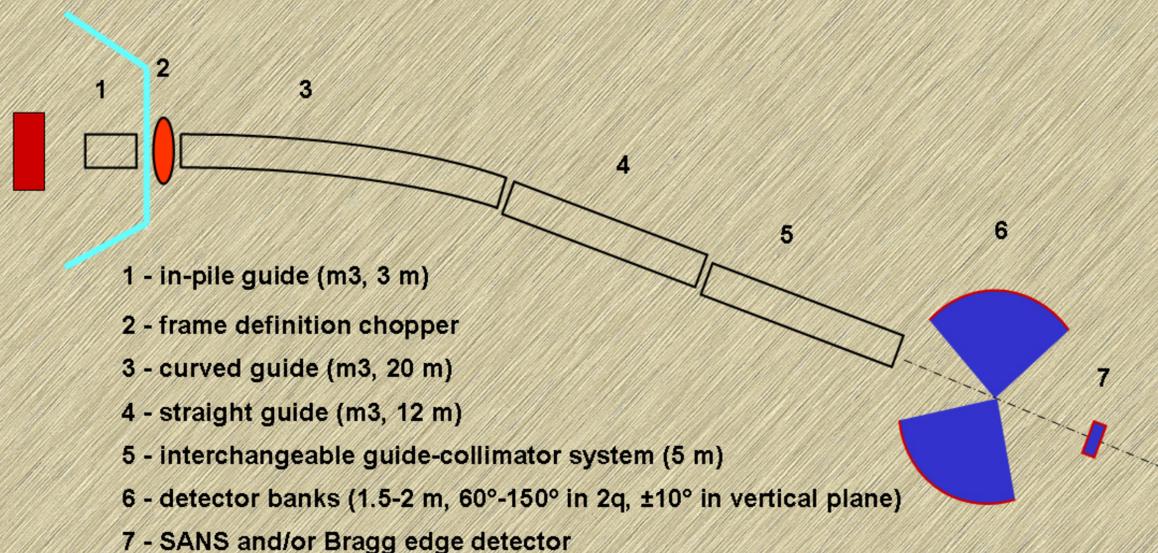


High Resolution Mode

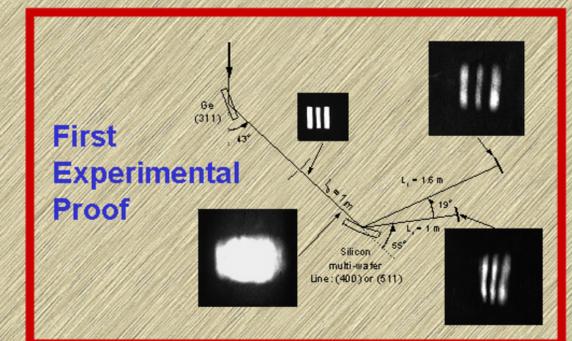
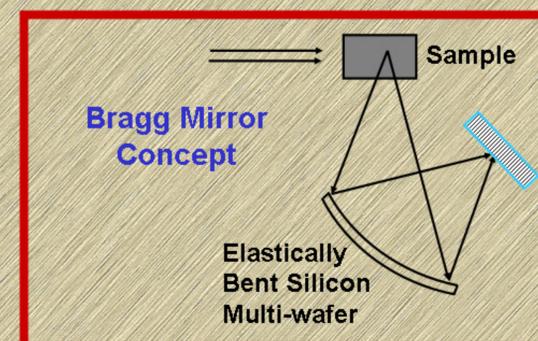


High Intensity Mode

- **Conceptual design for VULCAN has been approved by the SNS Experimental Facilities Advisory Committee**



- large secondary flight path to allow high Q-resolution and the optional use of novel neutron optics techniques for imaging



For further information, contact **Xun-Li Wang**, wangxl@ornl.gov, (865)574-9164