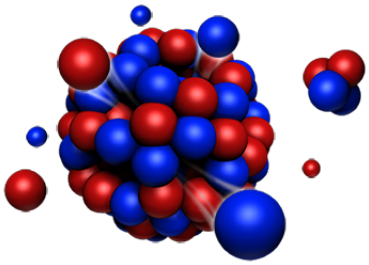

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MENUS - MATERIALS ENGINEERING BY NEUTRON SCATTERING

Thursday, 17 October 2019 16:30 (2 hours)

The proposed MENUS beam line at the second target station will be a transformational high-flux versatile multi-scale materials engineering beamline with unprecedented new capabilities for the study of low symmetry, complex materials. It will support both fundamental and applied materials science and engineering research in a broad range of fields, including advanced alloy design, energy storage and conversion, nuclear energy, aerospace, transportation and civil infrastructure. MENUS will combine unprecedented long-wavelength neutron flux and high detector coverage to enable real-time studies of complex structural and functional materials behavior under mechanical, thermal, electrical and magnetic fields. The instrument will incorporate SANS and imaging capabilities to extend its sensitivity to larger length scales and higher spatial resolution. With large out-of-plane detector coverage, high spatial resolution residual/in-situ stress measurements can be performed rapidly at once and in-situ, full ODF/SODF (orientation distribution function/stress-orientation distribution function) can be recorded by rotating the sample around a single axis. MENUS will complement the strengths of the current VULCAN engineering materials diffractometer that uses the high wavelength resolution of thermal neutrons available at the first target station to study high symmetry crystal structures in engineering materials and components. Specifically, in the Q-range matched to low symmetry materials ($\lambda \geq 4$Å), MENUS will have a neutron flux exceeding 2 orders of magnitude higher than VULCAN can deliver because of the high cold neutron brightness available at STS.

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