

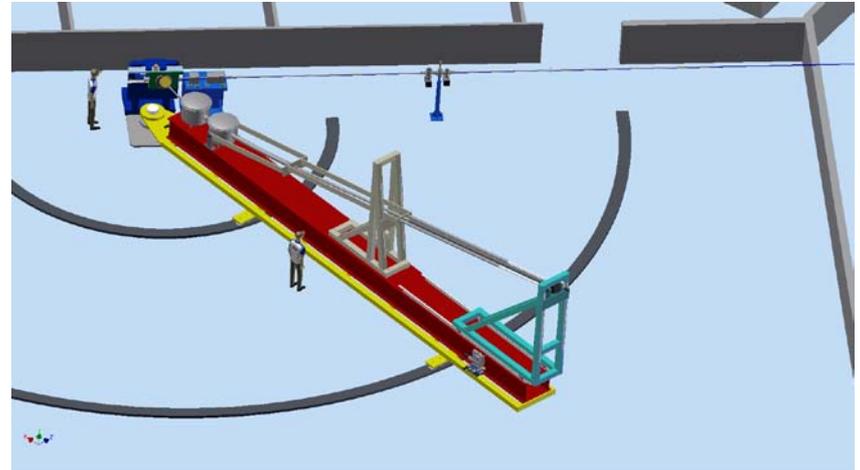
Soft Inelastic X-ray Scattering (SIX)

SIX at NSLS-II

- Will take advantage of the unique combination at NSLS-II of high brightness in the soft x-ray regime and ability for beamlines to go “long” to produce world-leading energy resolving power of 10^5 (factor of x10 better than anywhere else today)
- Will enable measurements of elementary excitations (magnons, phonons and orbitons) in condensed matter samples with extremely small volumes: surfaces, devices, nanoscaled systems *for the first time*

Examples of Science Areas & Impact

- **SUPERCONDUCTIVITY:** “Game changing” studies of electronic and lattice excitations in 3d transition metal oxides: “neutron scattering from 100 nm of material”; allows studies of excitations in devices and nanoscaled systems
- **CATALYSIS:** *In situ* studies of electronic structure of catalytic nanoparticles – facilitating rational design of next generation catalysts
- **ENERGY STORAGE:** *In situ* studies of electronic structure in next generation batteries



Endstation concept: Massive spectrometer arm for inertial and thermal mass, typical for large IXS spectrometers

SIX Beamline Capabilities

TECHNIQUE(S): resonant inelastic x-ray scattering

SOURCE: elliptically polarized undulators

ENERGY RANGE: 250 eV – 1500 eV

ENERGY RESOLUTION: 10 meV