

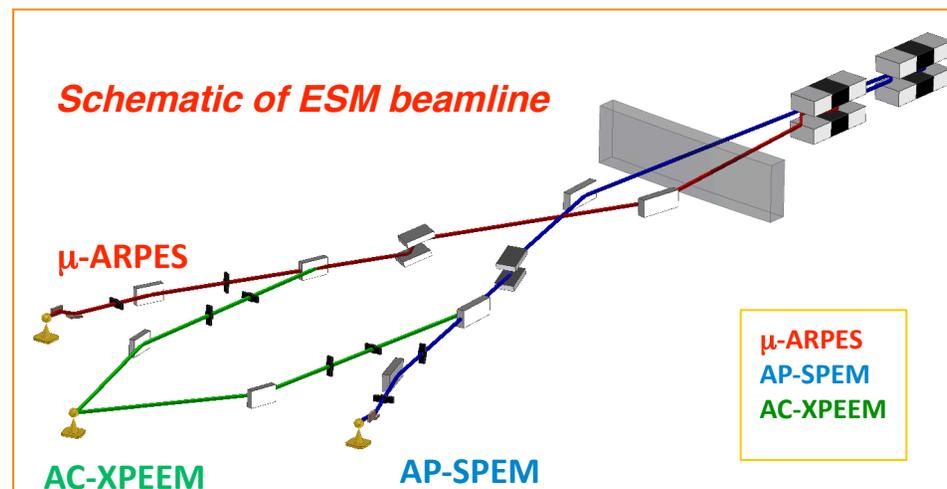
Photoemission-Microscopy Facility for Fundamental Studies of the Physics and Chemistry of Materials (ESM)

ESM at NSLS-II

- A suite of instruments to probe, characterize and design functional materials based on their electronic structure
- Overcoming traditional barriers: spatial averaging & ambient pressure
- Advancing photoemission to make contact with real devices and applications

Examples of Science Areas & Impact

- Electronic structure determination from ~ 1 μm samples (inside polycryst. grains and single magnetic domain)
- Electron dynamics & low energy excitations from ~ 1 μm samples (complex materials)
- Catalysis @ relevant partial pressures
- Chemical composition maps at ambient pressure
- Combinatorial investigation of multi-parameter samples
- Probing the electronic structure of real (micro-)devices (spintronics, fuel cells, etc.)



ESM Beamline Capabilities

TECHNIQUES: μ -SP-ARPES, AP-SPEM, XPEEM

SOURCES: EM-EPU180 /PM-EPU56 : (20-2000eV)

RESOLUTION:

< 1 meV to 70 eV (0.4 meV @ 20 eV)

< 30 meV to 1000 eV

< 300 meV to 2000 eV

FLUX: $> 10^{12}$ ph/sec @ 10000 resolving power

SPOT SIZE: 1 μm @ ARPES,

500 nm @ AP-SPEM, 30 μm @ XPEEM

SPATIAL RESOLUTION: 10 nm @ XPEEM