

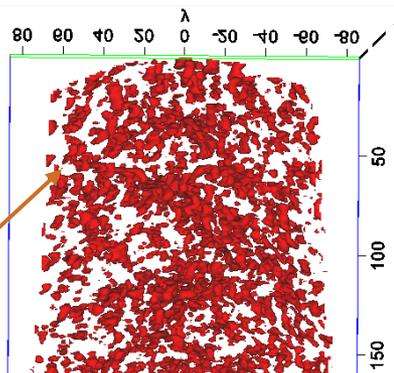
## Capability/Need

- Combination of atomic-scale point-projection microscope and time-of-flight mass spectrometry optimized for insulator analysis
- Provides three-dimensional atomic structure of materials, clusters and buried interfaces with fraction of a nanometer resolution and part-per-million sensitivity
- **New-generation capability** that provides unique opportunity to utilize/integrate the computational resources in EMSL to efficiently reconstruct structure and composition

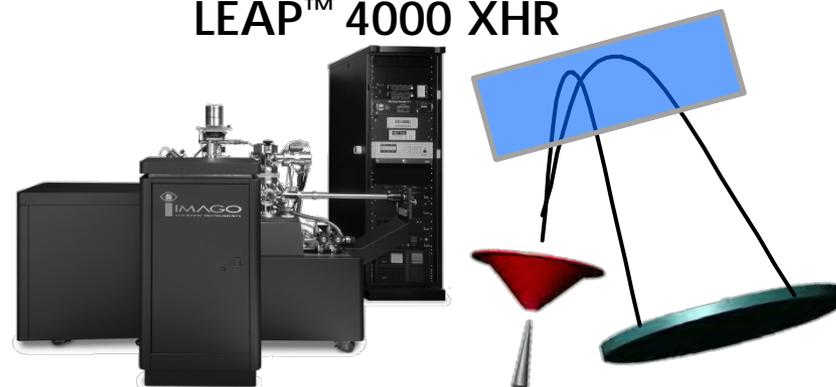
## Science/Users

- Extending the surface and interfacial analysis to **3D chemical imaging** regime with atomic resolution at unprecedented field-of-view
- Complements information available by transmission electron microscopy
- Buried interfacial analysis, distribution of deposits on mineral surfaces, dopant distribution and grain boundary segregation.

Distribution of Au nanoclusters in MgO formed by Au implantation



## LEAP™ 4000 XHR



Ion optics give longer flight path for higher mass resolution and lower background levels

## EMSL Strategy Alignment; Specifics

- Science themes: Geochemistry/Biogeochemistry and Subsurface Science; Science of Interfacial Phenomena
- Cross-cutting challenges: Static-Dynamics; Unprecedented Resolution; Design/Synthesis of Complex Materials
- EMSL capability area: Spectroscopy and Diffraction
- Anticipated availability: Summer 2010
- Technical POCs: Theva Thevuthasan, Satya Kuchibhatla