

Micro Imaging Lab

Our lab is devoted to imaging natural materials at several scales.

Optical microscopes

- Two Leica Microscopes
- DM750P polarization microscope with a DFC290 camera
- L2 binocular microscope with an EC3 camera attached. Utilizing the cameras which are attached to a computer, digital images of thin sections or micro-scale items of interest may be obtained



GIGAmacro Magnify2



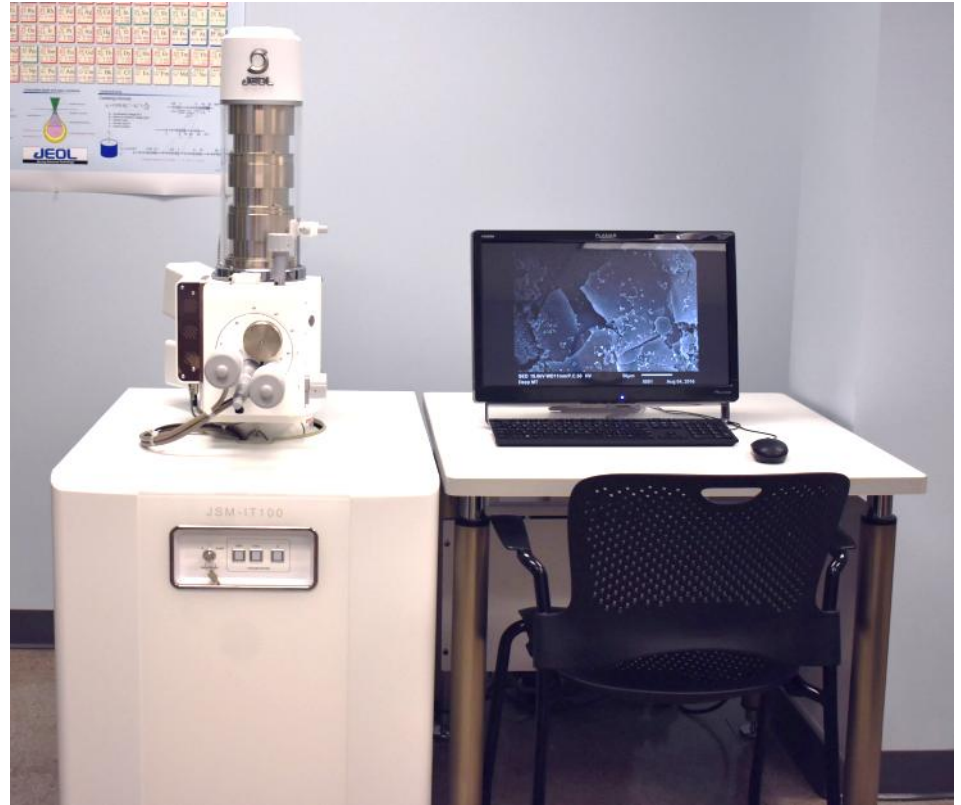
- The Micro Imaging Lab contains a GIGAmacro Magnify2 robotic imaging system complete with a capture/processing computer, Samsung LCD screen, Canon EOS Rebel T5i camera with lens options (such as a polarizer). The camera is affixed to a robotic arm above a platform. The system allows the user to control the robotic arm and camera through dedicated software. It combines focal stacking, image stitching, and 3D depthmaps for very high resolution imaging of thin sections and other materials within the imaging area of 63.5 cm (X) x 53.4 cm (Y) x 25.4 cm (Z). More information about the system may be found on the [GIGAmacro website](http://www.gigamacro.com/gigapixel-macro-imaging-system/) at <http://www.gigamacro.com/gigapixel-macro-imaging-system/>.

SEM JEOL JSM-IT100 with EDS

New JEOL JSM-IT100 scanning electron microscope.

This SEM is flexible and powerful, using secondary electron imaging to reveal very small surface topography. Useful for studying regions that range in size from a millimeter to a micron or less

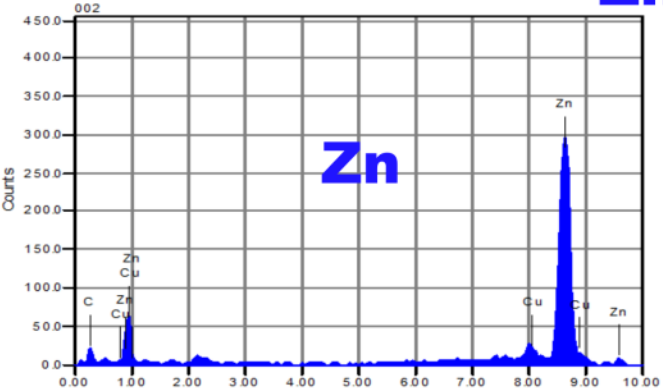
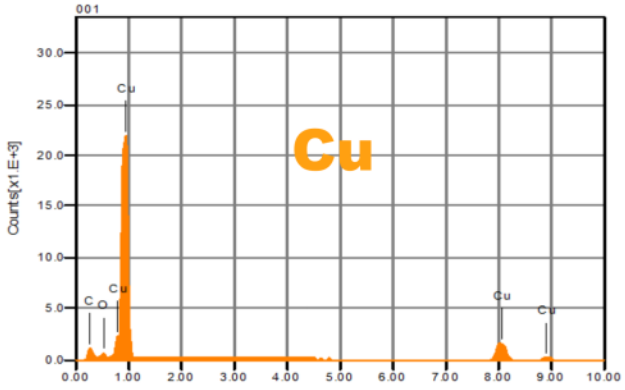
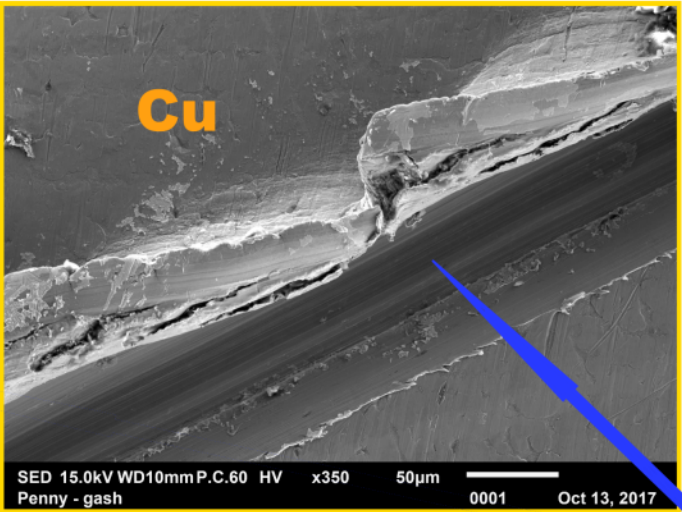
Backscatter electron imaging to reveal phases with different atomic weight, and energy-dispersive X-Ray analysis .



Penny image and chemical analysis



Left: Image of U.S. 1 cent piece (reverse) with gash location shown in yellow box. Below: SEM secondary electron image of portion of gash. Note 50 micron scale bar. Gash exposes zinc underneath copper plate. Energy spectra at bottom show copper and zinc, location of zinc as shown with arrow. Bright area is topographic high of copper plate resulting from gash.



Emitted energy (kiloelectron volts)

Zn

1986 Proof U.S. 1 cent piece (reverse)

Photography stand image

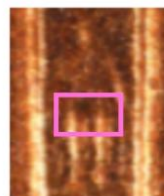


0.75 mm



0.25 mm

GIGAmacro image

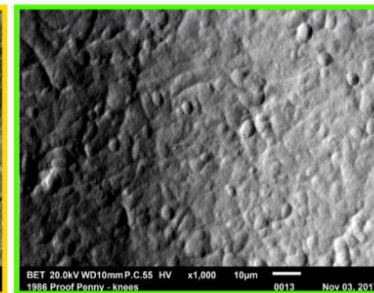
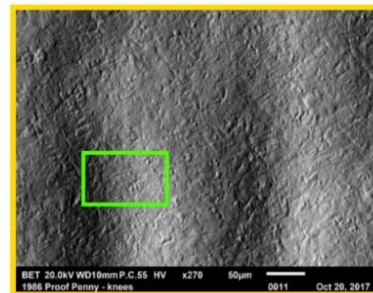
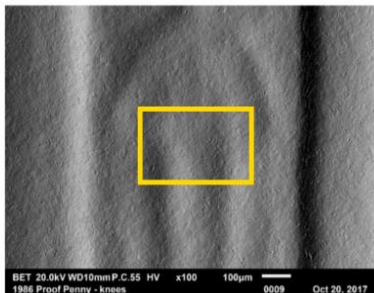
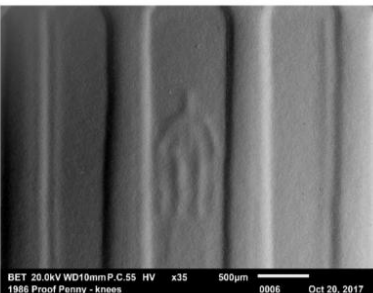


0.75 mm



0.25 mm

SEM back-scattered electrons image



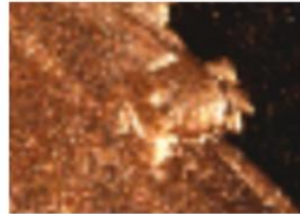
1986 Proof U.S. 1 cent piece (obverse)

Photography stand image



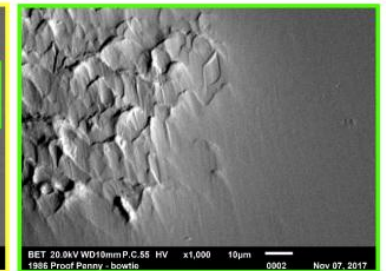
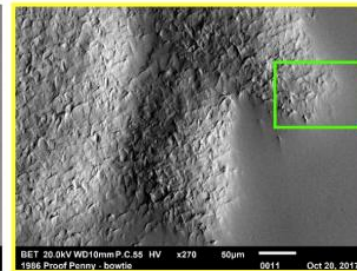
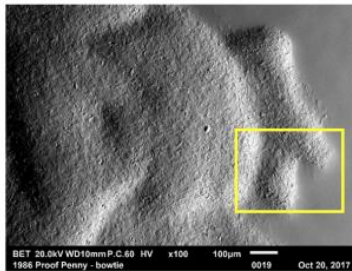
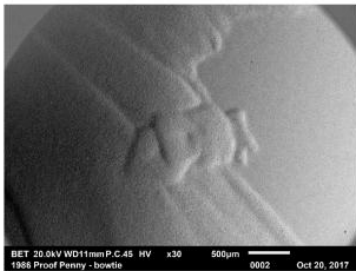
1 mm

GIGAmacro image



1 mm

SEM back-scattered electrons image



Niton™ XL3t Ultra

compact energy
dispersive portable
XRF spectrometer
for reliable non-
contact and non-
destructive
elemental analysis
of valuable
materials

