



MRL

FREDERICK SEITZ MATERIALS RESEARCH LABORATORY



2:00 PM, Wednesday, October 15, 2008
Room 280 MRL

Introduction to the Orion Helium Ion Microscope

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We will be discussing the fundamentals and applications behind a radically new charged particle microscopy technique based on the ALIS gas field ion source. This new approach is needed to address two technology issues related to electron beam based microscopy: the limitations in the achievable probe size and the need for better sample information than electron-surface interaction physics affords.

Electron beam sources and round optics are both mature technologies, and thus further improvements are incremental in nature and increasingly complex. The ALIS technology is descended from the field ion microscope (FIM), which was the first technique for imaging atomic lattice structure. The ALIS ion source technology provides the ability to obtain a large ion current from a single atomic emitter, producing a high quality beam. We will discuss the source properties, beam quality, and operation.

Second, we will look at the unique interactions between the helium ion beam and the sample surface and how it produces topological and material information. We will compare beam/sample interaction and images to the SEM, specifically covering image contrast and resolution factors. We will touch also upon development work we are pursuing in furtherance of the technology.

Facilites Seminar Series