



Centre for Research in Nanotechnology & Science (CRNTS)

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Flexible and easy to use SEM for the widest range of samples



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**Platform
(Microsoft Teams)**

Scanning Electron Microscopy (SEM) is indispensable when microscale material insight is required. SEM is not only capable of creating excellent surface topography images, it also provides materials contrast and access to crystallography and elemental composition. Since their introduction, SEMs have seen a progressive increase in their use and range of applications. SEM's have developed in their resolution performance, analytical capabilities, and the possibility to process a wider mix of materials, ranging from conductive and non-conductive materials to wet and humid specimens in their natural states.

While electron microscopy (EM) has traditionally been a static imaging method, advances in sample handling and rapid imaging have allowed the technique to be used for live, in situ observations. As materials research continues to advance, it is becoming increasingly important to not only observe materials in their initial and final states but also throughout their various applications. This might include imaging metal feed stocks as they are heated for additive manufacturing or wetting and drying of functionalized nano particles to understand their behavior in real-world conditions. Characterization of these behaviors is crucial, as they impact critical research areas such as clean energy, transportation, catalysis, nano-electronics, and even human health.

Environmental scanning electron microscopy (ESEM) expands the boundaries of traditional SEM to deliver deeper insights into all types of samples. ESEM technology allows for the imaging of samples with minimal preparation and adds variables such as hydration, thermal cycling, and the introduction of gas to characterize in situ, dynamic changes. Using water vapor and a temperature control stage, some of the "impossible to image samples" such as highly out gassing and naturally hydrated samples are now easily characterized using the ESEM.

ESEM is a highly flexible technology, capable of remarkable all-around performance under a variety of conditions. This talk will discuss the basic principles of SEM imaging and the unique capabilities of a ESEM technology to the audience.

For Registration : <https://events.teams.microsoft.com/event/15a771fc-bb83-4fbd-affb-3788f24e4918@403ee5f4-55b3-45cd-8ae2-824be887a075>

Organizer: Prof. Suparna Mukherji, Head, SAIF/CRNTS, IIT Bombay.

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