

# Through the Lenses of a Scanning Electron Microscope



The Scanning Electron Microscope

The first commercial scanning electron microscope (SEM) was introduced in 1965. The development of the SEM created new areas of study in the medical and physical sciences because it allowed examination of a great variety of specimens at unprecedented magnifications and resolution.

Unlike an optical microscope, which uses lenses to bend light waves and focus on the specimen, the SEM uses electromagnetic lenses to bend an electron beam, which is used to produce the image on a screen.

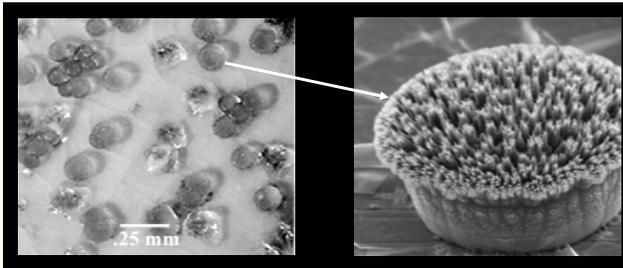


Image of corroded glass surface taken with a light microscope

SEM image of a single particle located on glass surface

## How a Scanning Electron Microscope Works

A scanning electron microscope, or SEM, uses something similar to a light bulb to produce electrons. This is called the filament. The filament is a piece of wire that gives off electrons when electricity goes through it. These electrons are focused by a series of magnets. The magnets are made magnetic by electricity and are called electromagnets. The magnets are used to focus the electron beam onto the sample. The electron beam interacts with the sample in such a way that electron signals come off of the sample surface. A special type of signal detector, which acts like a TV camera, picks up the signals and displays an image of the sample on a TV screen.

