Beam-Based Defect Localization

This short course discusses SEM and SOM techniques for IC failure analysis. All of these techniques can be performed on a standard SEM or SOM (using the proper laser wavelengths). The use of advanced electron beam test systems will also be discussed. The goal is to provide beneficial information to both novice and experienced failure analysts. Topics are: 1) Standard techniques: secondary electron imaging for surface topology, backscattered electron imaging, voltage contrast, capacitive coupling voltage contrast, x-ray analysis and electron beam induced current imaging; 2) Specialized SEM techniques: novel voltage contrast applications, resistive contrast imaging, and charge-induced voltage alteration (both high and low energy versions); and 3) SOM techniques: light-induced voltage alteration, thermally-induced voltage alteration/optical beam induced resistance change, Seebeck Effect imaging, soft defect localization/laser-assisted device alteration, laser voltage probing and solid immersion lens applications.