

Microanalysis: What is it, Where Did it Come From, and Where is it Going?

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“Microanalysis” in the Microanalysis Society parlance refers to spatially-resolved elemental and molecular analysis performed at the micrometer to nanometer to picometer scales. Our “founding father”, Raymond Castaing, achieved the first practical elemental microanalysis at the micrometer scale in his seminal Ph.D. thesis of 1951, wherein he not only made the first successful microprobe instrument for electron-excited x-ray spectrometry but also described the physical basis for converting the measured x-ray intensities into concentration values. Electron-excited x-ray microanalysis has been the backbone of MAS and its predecessors (EPASA, the Electron Probe Analysis Society of America and the Microbeam Analysis Society), and it has been joined by other excitation beams (ions and photons) and spectrometries (ion, electron, and photon). Although every niche in excitation-detection combinations has been explored, present excitement comes from exploiting large scale data structures collected as multi-dimensional spectrum images with the advanced software systems that can mine these vast structures for the information contained therein. The future as always is unpredictable, but improvements in spatial resolution, efficiency, and specificity are likely.