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ÉCOLE POLYTECHNIQUE
FÉDÉRALE DE LAUSANNE

LNMC SEMINAR

Thursday, June 2nd, 2016

14h30

Jean-Claude Menard

Electron Microscopist, Founder of Ahead Microscopy

Host: Henry Markram

"The SICLOP detector: a novel imaging method in scanning electron microscopy"

Abstract

Most modern digital imaging systems are based as a two dimensions matrix (the 2D image), where the picture element (i.e. the pixel) is defined as the quantum based unit from some thousands, millions or even billions that compose the watched scene.

In a Scanning Electron Microscope (SEM) , by impinging the sample with a controlled electron beam, can handle multiple, progressive and continuous magnifications from the visible scale to nanoscale (some 10^{-9} meters) offering huge capabilities in providing information in both life and material sciences. The SEM electron beam to sample interactions provides a universe of re-emissions composed by electron species that handle sample information in deeper scales. Most of them have been described and classified in details with single techniques using various and dedicated 0D detectors.

The new SICLOP (Spatial Imaging Control in Live OPeration) detector is, by its concept imported from a supposed or admitted human vision strategy: fed with predictable patterns and uploaded into its optronic calculator. Finally, its output signal is still dimensionless, but resulting from a direct correlated and coherent calculation between the patterns and the watched scene.

From various examples in SEM electron detection, the SICLOP concept will be presented and discussed as a possible efficient human like imaging device.