Titan Themis – the new aberration corrected S/TEM

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Aberration corrected S/TEM is receiving more and more attention from the materials research and nano research scientists due to its unique imaging capability at atomic resolution. The break-through in spherical aberration correction made it possible to build new S/TEM platform of sub-Angstrom resolution. In this talk FEI’s new generation of aberration corrected S/TEM, Titan Themis, will be presented. The benefit of probe Cs corrector for STEM as well as image Cs corrector for TEM is presented. How the three lens condenser system helps ease of use in TEM mode as well as in STEM mode. How the Piezo component of CompuStage helps faster data acquisition particularly for in-situ experiment. A few years ago FEI introduced ChemiSTEM technology, which is based on FEI’s patented Super-X SDD EDX detectors. This unique design integrated 4x SDD EDX detectors into the pole piece of a TEM, which symmetrically placed above the sample and has a solid collection angle of 07-0.9 srd. The windowless design makes it more sensitive to light element detection. The improved detector efficiency allows detection of trace element such as grain boundary segregation. When such a technology placed on a Titan, EDX mapping at atomic resolution becomes reality. Thanks to the symmetric design of its EDX detectors above the sample it has unique capability of EDX 3D chemical tomography. Titan Themis also integrated “differential phase contrast” (DPC) mode which allows imaging of magnetic field as well as electric field down to nanometer or atomic resolution.