



COSIMA - An in-situ cometary grain TOF-SIMS scanning instrument

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COSIMA or the COmetary Secondary Ion Mass Analyzer onboard the ESA Rosetta mission towards comet 67P/Churyumov-Gerasimenko is a TOF SIMS instrument equipped with a primary indium ion source, a high resolution mass spectrometer, an optical microscope and a sample manipulation unit. The latter allows to scan the collecting metal targets by moving the selected target in the plane perpendicular to the stationary mass spectrometer. While the optical depth resolution is limited to the optical wavelength of the illumination source, the time-of-flight secondary ion spectrometer technique is a truly 2D method, probing the very top atomic layers of the sample surface. We discuss the advantages of this approach in view of compositional imaging techniques for present and future space exploration.