

Title: Ion microscope with SIMS and ion-beam sectioning, nano-scale 3D composition and '*in-operando*' processing

Abstract: The UHV Ion Microscope (*'High5'*) records simultaneous positive and negative SIMS maps for 3D chemical reconstruction at multi-scale lengths from nm's to several 100 microns by using the novel Hyperion gas ICP ion source and a 4 lens column. This new and unique instrument has been designed to contribute to a wide range of topic themes including energy conversion and storage, advanced metal alloys, information storage, micro-electronics and healthcare that are the focus of 13 co-investigators based in ICL, UCL & KCL. An emphasis has been placed on thermal and electrical '*in-operando*' processing in the UHV analysis chamber. There are two LoadLocks that include similar pre-processing facilities as in the main chamber. Dry and moist oxygen-18 ambients for exchange reactions is provided in one of the LoadLocks, also sample topography measurements and a vacuum suitcase port for air-sensitive samples.

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