PhotoEmission Electron Microscopy at the new high-brilliance beamline at Diamond

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Diamond is a third generation 3 GeV synchrotron light source currently under construction in the South Oxfordshire in the UK. The design of a new high-brilliance beamline, which encompasses a collimated light plane grating monochromator and Kirkpatrick-Baez (KB) mirrors focusing the beam to an 11 micron x 4 micron spot is presented. A spectral resolving power greater than 5000 will be available from 80 eV through to 2100 eV allowing the measurement from the Si L2,3 edges all the way to the rare earth M4,5 edges. A pair of APPLE2 undulators, producing linearly and circularly polarised light, will allow fast changes between polarisations.

The beamline will image at high spatial resolution with the LEEM III microscope (Elmitec GmbH) equipped with energy filter using X-ray absorption spectroscopy (XAS) and X-ray photoemission spectroscopy (XPS) as main contrast mechanisms. An overview of the diverse nanoscience applications in areas as diverse as catalysis, magnetism, chiral thin films and environmental science will be presented along with the current construction progress.