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Micro-Computed Tomography (MCT): A BRIGHT new beamline at ANSTO/Australian Synchrotron

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Micro-Computed Tomography (MCT) has been announced as one of the first new beamlines to be constructed at the Australian Synchrotron as part of the BRIGHT program. MCT will complement the existing X-ray imaging/tomography capability provided by the Imaging and Medical Beamline (IMBL), and will target applications requiring higher (sub-micron) spatial resolution and involving smaller samples. MCT will be a bending-magnet beamline, operating in the 8 to 40 keV range, based on a double-multilayer monochromator. This monochromator will be able to be removed from the X-ray beam path, enabling studies with a filtered white beam when required. The photon-delivery system will also house a single-(vertical)bounce mirror, capable of suppressing harmonic contamination in low-energy monochromatic beams and providing the means to shape the spectrum of filtered white beams on the high-energy side. MCT will benefit from X-ray phase-contrast modalities (such as propagation-based, grating-based and speckle) in addition to conventional absorption contrast, and be equipped with a robotic stage for rapid sample exchange. A higher-resolution CT configuration based on the use of a Fresnel zone plate system will also be available. A number of sample environmental stages, such as for high temperature and the application of loads, are planned in collaboration with certain groups in the user community.

Anticipated application areas for non-destructive 3D sample characterization include biomedical/ health science, food, materials science, and palaeontology. This presentation will provide an update on the progress of the MCT project, detailing the current design, planning and procurement effort.

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