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Synchrotron Light Sources: Working with and for industry

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The creation and tailoring of new materials are at the heart of current industry challenges. New materials must meet ever more stringent requirements of performance, whilst fitting into the modern cradle-to-grave cycle of material production, use, and recycling. The properties and function expected of materials depend heavily upon their composition and their micro- or even nano-structure. Their "ultimate" characterisation is possible down to the atomic scale using the tools and techniques of large-scale facilities such as synchrotron X-rays.

Synchrotron X-rays are a non-destructive probe of material structure at length scales ranging from centimetres to the size of an atom. Special properties such as element selectivity offer a variety of analytical tools for characterising materials under in situ conditions (heat, cold, pressure, chemical, stress/tension, electrical/magnetic fields….) and in real time that are not accessible with traditional techniques. Synchrotrons therefore provide the ability to visualise the atomic, nano, and macro-structure of a huge range of complex real-world materials, often under processing or end-use conditions and in real time. This capability lends itself to an equally wide range of industrial R&D problems which, in particular, have been adopted by the healthcare industry. Beyond drug discovery and development, synchrotron facilities are also very active in providing analysis for micro- and nano-electronics, energy and smart materials, transport, chemistry and catalysis, engineering materials, and home and body care amongst others.

In this context, new business models are springing to life, with more partnerships, more services, and nimble small start-ups bridging the gap between the oft "ivory tower" nature of research infrastructure and the commercially driven industry world.

This poster will present how ESRF works with industry in delivering advanced materials characterisation for innovative industrial and applied R&D.

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