

Our impact - nano

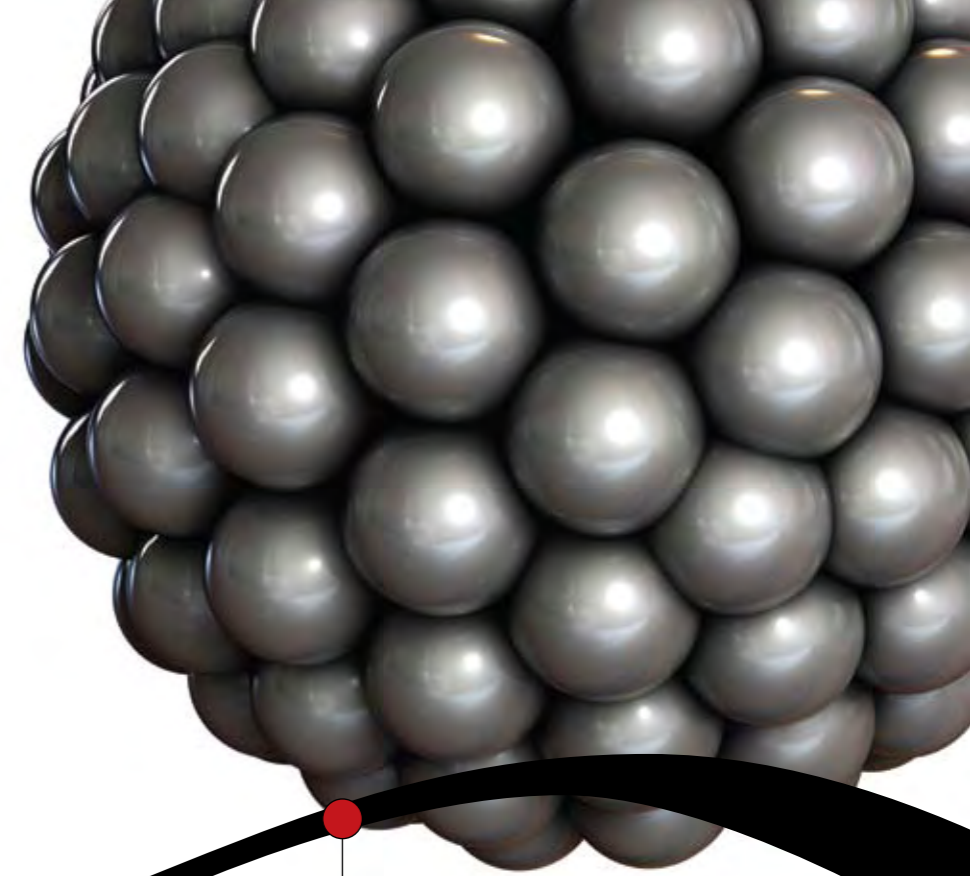
The research

In 2002 the UK government decided that it needed to do more to provide the best possible conditions in the UK for the nanotechnology industry to innovate and grow. A critical element of that work is the development of terminology, international standards and measurement infrastructure to support the innovative and effective use of nanotechnologies and to assess the possible implications of nanoparticles on public health and the environment.

Since that time, NPL has played a lead role in international efforts to develop nanostandards, terminology and measurement techniques. NPL provides expert UK representation on ISO,

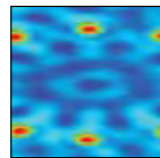
BSI and CEN technical committees and leads a range of related research projects. To date NPL's involvement has been vital to the development of standard terminology and classifications covering everything from nanoparticles, carbon nanostructures and nanomaterials to common nanoscale measurement terms, medical and consumer applications of nanotechnologies.

This work represents an important first step in the development of internationally accepted standards for the safe, effective and innovative use of nanotechnologies and materials – and NPL's lead role represents a clear competitive advantage for UK industry.



Second Life

In 2007, NPL established NanoLands in the 3D virtual world, Second Life. The development established a real-time, interactive environment where the global nanotechnology community can come together to discuss key ideas, issues and research. NanoLands also provides resources and mentoring to help nanotechnology researchers and businesses to get started.



UK standards

In 2007, the British Standards Institute published nine documents on nanotechnology terminology and guidance for UK industry, all of which were developed with strong support from nanotechnology specialists at NPL.

These developments help to equip the UK to take up a market leading position in a global nanotechnology market that is expected to grow to well over £500 million by 2015. Future applications could include smart drug delivery systems, hydrogen storage, energy efficient systems, plastic electronics and conductive composites, self-repairing or self-sensing materials and even photovoltaic particles for use in paints.



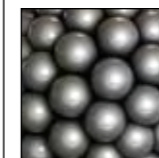
Nanoanalysis

NPL is developing sophisticated nanoscale surface analysis techniques based on atomic force microscopy, secondary ion mass spectroscopy and x-ray photoelectron spectroscopy. This work, through the development of new analytical methods, will provide robust and powerful methods by which to obtain physiochemical properties of fibre surfaces at the nanoscale.



Joanna Lee

Joanna Lee, from our Surface and Nanoanalysis Group, was this year recognised in the Institute of Physics Early Career Woman Physicist of the Year award. Her outstanding work on time-of-flight secondary ion mass spectrometry has applications in many innovative technologies such as drug delivery systems, bio-molecular engineering for diagnostics, and personal care products. She has also designed a range of interactive educational exhibits for NanoLands.



Nanoparticles

The NPL nanomaterials team has developed the metrology expertise required to measure nanoparticles less than 1 nm. The work represents an important breakthrough in a wider effort to develop traceable standards for nanoparticles of less than 50 nm. The team is now leading a European project to provide traceable standards and procedures to determine the size, shape and distribution of nanoparticles, with an accuracy of better than 1 nm.



Surface area

The increased surface area to volume ratio of nanoparticles boosts the efficiency of existing catalysts or powder-based products. NPL's leading role in the development of international standards for the measurement and application of nano particles is vital to their commercial exploitation – for instance in the form of highly concentrated ink suspensions, drug delivery agents or novel composite materials for the transport industry.