Small Science – Big Future

Lecture by Dr Annela Seddon of Bristol University

The Romans used nano-technology: the remarkable Lycurgus cup in the British Museum looks green when light reflects from the glass surface and red when light comes through the glass. We do not know quite how they managed to make and disperse nano-sized gold particles throughout the glass, and they certainly did not know why this worked. However, Dr Seddon, with audience participation, clearly demonstrated that particles containing a small number of atoms must have more atoms near the surface and more "free arms" that can get involved in chemical bonding and physical interactions. Size matters, and small is beautiful.

We are now beginning to understand the science at a fundamental level because of instruments that can "see" individual atoms and "tweezers" made out of light that move them around with exquisite precision. (We were treated to a virtuoso video of ten atoms made to skip in a "strip-the-willow" dance pattern.) We do not yet know the impact that will arise from applications of nano-technology. These are potentially game-changers for some of our most concerning problems, such as the possibility of water desalination at a fraction of current costs, or ultra-precise drug delivery to cancer cells. These must be balanced against concerns about unpredicted environmental side-effects relevant to anything likely to be widely dispersed. Although "grey-goo" worries appear unwarranted, it is also clear that as with any high-impact technology effective regulation is essential.

Dr Seddon gave a highly polished performance, and educated, informed and entertained the audience with her fascinating presentation.