A cluster of twenty atoms of gold is visualised for the first time by Birmingham physicists

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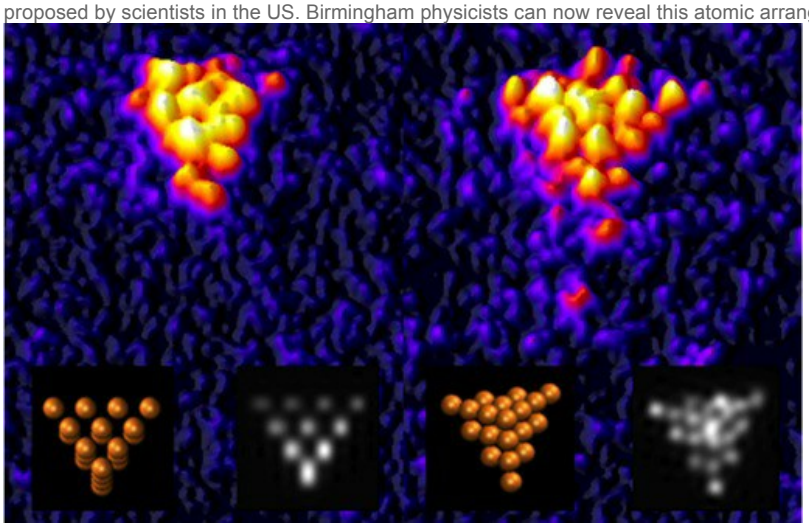
Scientists at the University of Birmingham have developed a method to visualise gold on the nanoscale by using a special probe beam to image 20 atoms of gold bound together to make a cluster. The research is published today (26 July 2012) in the Royal Society of Chemistry's journal Nanoscale.

Physicists have theorised for many years how atoms of gold and other elements would be arranged and ten years ago the structure of a 20-atom tetrahedral pyramid was proposed by scientists in the US. Birmingham physicists can now reveal this atomic arrangement for the first time by imaging the cluster with an electron microscope.



Gold is a noble metal which is unreactive and thus resistant to contamination in our every day experience, but at the smallest, nano scale it becomes highly active chemically and can be used as a catalyst for controlling chemical reactions.

Clusters of metal atoms are used in catalysis in various industries including oil refining, the food industry, fine chemicals, perfumery and pharmaceuticals as well as in fuel cells for clean power systems for cars.

Richard Palmer (/staff/profiles/physics/palmer-richard.aspx), the University of Birmingham's Professor of Experimental Physics, Head of the **Nanoscale Physics Research Laboratory (http://nprl.bham.ac.uk/Research/index.php)**, and lead investigator, said: *'We are working to drive up the rate of production of these very precisely defined nano-objects to supply to companies for applications such as catalysis. Selective processes generate less waste and avoid harmful biproducts – this is green chemistry using gold.'*

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Notes to Editors
1. This research is published in the Royal Society of Chemistry's journal Nanoscale, where it provides the cover image.
2. A high resolution picture of the tetrahedron of 20 gold atoms is available at **www.nprl.bham.ac.uk/NPRLNews/Au20.php (http://www.nprl.bham.ac.uk/NPRLNews/Au20.php)**

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