

# Chemistry research could produce faster computers

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Chemists at the University of Liverpool are helping to create future electronics based on molecules for faster and smaller computers.

Experts have been working for many years to understand how to work with electronic material produced on an increasingly small scale. In the emerging field of nano-science and nano-technologies it is important for scientists to be able to control the structure and bonding of molecules that are used in creating small scale electronic components for products such as computers.

Scientists at Liverpool have succeeded in imaging and forming a unique bond between a single gold atom and a single organic molecule called a pentacene. They managed to bind the atom to the pentacene and take images of rearrangements of the electrons participating in the formation of the chemical bond.

The team selected the pentacene as it is a special class of molecule that has qualities of particular use in molecular electronics. The gold atom is a metal atom that attracts an extra electron.

Professor Mats Persson, from the University's Department of Chemistry said: "This new experiment allows us to control the arrangement and shape of chemical bonds and to gain new insight into making contact with a single molecule with potential importance for molecular electronics. There will come a time when electronic material will become so small that we will need to control the structure down to the

atomic scale and the chemical bonds between single molecules and atoms.

"The atomic scale control of single-molecule chemistry in this experiment opens up new perspectives in the emerging field of molecular electronics, particularly in connecting organic molecules with electronic components. This could be important in creating electronics for future computers which are faster, smaller and have less power consumption."

Source: University of Liverpool

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