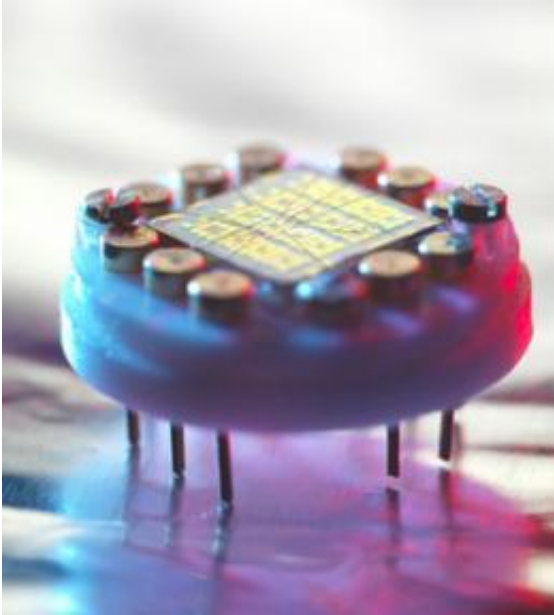


Shining light on graphene sensors

January 10 2011



A light-sensitive graphene/polymer heterostructure.

National Physical Laboratory, together with an international team of scientists, have published research showing how light can be used to control graphene's electrical properties. This advance is an important step towards developing highly sensitive graphene-based electronic devices.

Graphene is an extraordinary two-dimensional material made of a single atomic layer of carbon atoms. It is the thinnest material known to man, and yet is one of the strongest ever tested.

It has unique properties which make it a very exciting material for a huge range of applications from high-speed electronics and [solar cells](#), to super-sensors capable of detecting single molecules of toxic gases.

It is able to act as a sensor because its entire structure is exposed to its surroundings, and it reacts to any molecules that touch its surface. This reaction causes graphene's electrical properties to alter, i.e. it senses the molecules' presence.

In their paper published in the *Journal of Advanced Materials*, the team show that when [graphene](#) is coated with light-sensitive polymers its unique [electrical properties](#) can be precisely controlled and therefore exploited.

The polymers also protect graphene from contamination.

Light-modified graphene chips have already been used at NPL in ultra-precision experiments to measure the quantum of the electrical resistance.

In the future similar polymers could be used to effectively 'translate' information from their surroundings and influence how graphene behaves. This effect could be exploited to develop robust reliable sensors for smoke, poisonous gases, or any targeted molecule.

More information: Read paper: 'Non-volatile Photo-Chemical Gating of an Epitaxial Graphene-Polymer Heterostructure' in the *Journal of Advanced Materials*. [onlinelibrary.wiley.com/doi/10 ... a.201003993/abstract](http://onlinelibrary.wiley.com/doi/10.1002/adma.201003993/abstract)

Provided by National Physical Laboratory

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