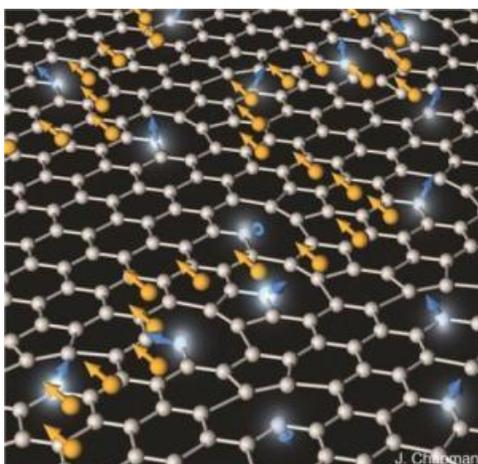


New possibilities with Magnetism and Graphene



A University of Manchester team led by Dr Irina Grigorieva demonstrated how to create elementary magnetic moments in graphene and then switch them on and off. *Graphene can be made magnetic and its magnetism switched on and off at the press of a button*, opening a new possible improvements to electronics with low power consumption.

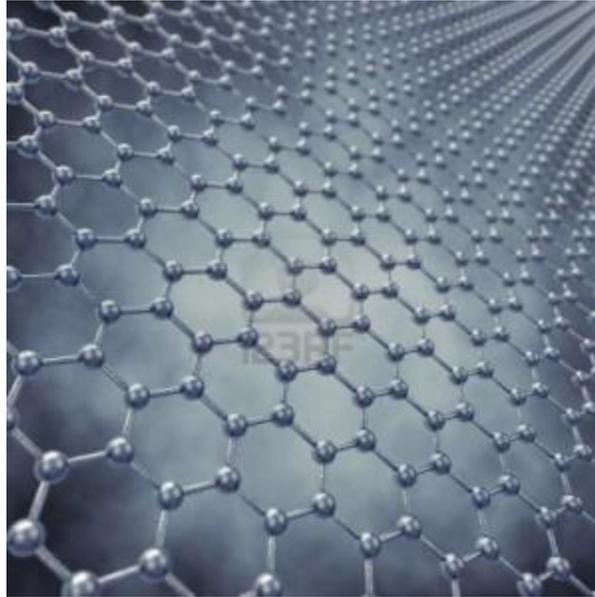
Dr Rahul Nair, who led the experimental effort, comments *“Previously, one could only change a direction in which a magnet is magnetized from north to south. Now we can switch on and off the magnetism entirely”*.

It is possible to remove some of these atoms which results in microscopic holes called vacancies. The Manchester scientists have shown that electrons condense around these holes into small electronic clouds, and each of them behaves like a microscopic magnet carrying one unit of magnetism, spin. Dr Grigorieva and her team have shown that the magnetic clouds can be controlled to dissipated and then condensed back.

She explains: “This breakthrough allows us to work towards transistor-like devices in which information is written down by switching graphene between its magnetic and non-magnetic states. These states can be read out either in the conventional manner by pushing an electric current through or, even better, by using a spin flow. Such transistors have been a holy grail of spintronics.”

I expect apart from the electronic and memory applications, this development will fire the imagination of great inventors and researchers who have for years being trying to develop magnetic motors, generators and other power producing devices. The key

issue has always been what is called the “sticking point” where the energy needed to reverse the polarity of a magnet, or to nullify the magnetic field (in electromagnetic devices) always exceeded the energy that could be harvested. This was always a necessity in keeping the devices running. To date, no device has successfully been replicated, peer reviewed or publicly demonstrated in a way that would eliminate any doubt of other sources of energy were being used to sustain its function.



I am not suggesting this announcement implies it is possible to develop and over-unity magnetic motor or generator. It does open the door to revisit some of the research of others in that past who were also dealing with technologies relying on flipping the magnetic fields. (Floyd Sweet?)

The practicalities of applying this discovery may be restrictive from an engineering point of view, and its value restricted to electronics and digital memory applications.

Nobel Laureate and co-author of the paper Professor Andre Geim was quoted *“I wonder how many more surprises graphene keeps in store. This one has come out of the blue. We have to wait and see for a few years but the switchable magnetism may lead to an impact exceeding most optimistic expectations.”*

Source: <http://revolution-green.com/breakthroughs-with-magnetism-and-graphene/>