The main attraction

Researchers at the University are using high magnetic fields to simulate the conditions of zero or reduced gravity that astronauts encounter in orbiting space stations or on the surface of the Moon. These experiments on the effect of weightlessness on the growth of plants may lead to the development of future crops that can grow in the low gravity environments of the Moon or the planet Mars.

The Basic Technology Research Programme of the Engineering and Physical Sciences Research Council has recently awarded the Nottingham team £1.2 million, shared between the School of Physics and Astronomy, the School of Chemical, Environmental and Mining Engineering and the Schools of Biology and Biosciences.

Using magnetic levitation to simulate microgravity, without the need for expensive space-based experiments, is just one aspect of the project. The team will also investigate the use of magnetic levitation as a technology for mineral and nanoparticle separation.

In a magnetic field, different particles can be manipulated in a way that effectively overcomes the force of gravity. Industrial processing increasingly demands finer ore particles for the extraction of valuable and useful metals for applications from aerospace alloy manufacture to catalytic converter development. But current methods of separating the different particles in a mineral conglomerate are still relatively crude and limited.

The research team hopes that applying magnetic levitation technology will allow them to extract particles from a mixture in an environmentally-friendly and energy-efficient way.

The third part of the project, being carried out in collaboration with The University of Oxford, will investigate how high magnetic fields can be used to sort and order single-walled carbon nanotubes, which are being intensively investigated worldwide for applications in electronics and other materials technologies. The team is also planning to investigate how the high magnetic field system could be used to understand the properties of other exotic molecules and nanostructures.