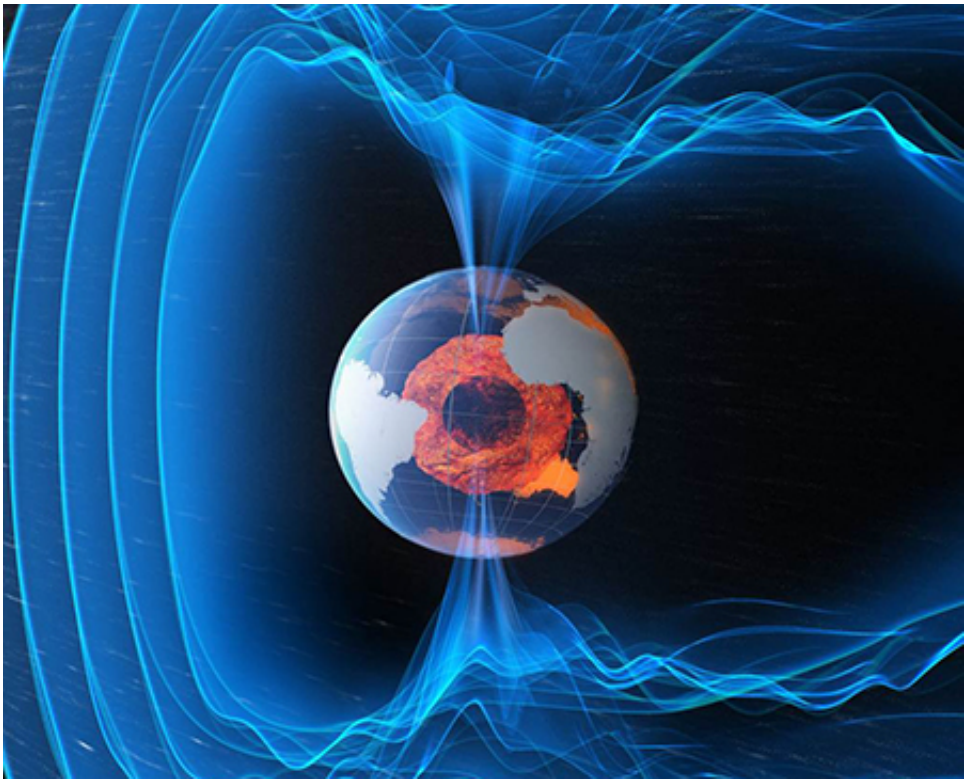
Satellite's magnetic mapping mission

December 12 2013



Although invisible, the magnetic field and electric currents in and around Earth generate complex forces that have immeasurable impact on everyday life.

A scientist from the University of Liverpool will play a leading role in the European Space Agency's (ESA) satellite mission to study the Earth's geomagnetic field.

Dr Richard Holme, from the School of Environmental Sciences, leads the team responsible for the vector magnetic calibration for the mission,

called Swarm.

Swarm consists of three identical satellites which have successfully launched into space from Plesetsk, Russia, near the Arctic coast. Their super-sensitive instrumentation acts like a 3-D compass, enabling the precise strength and direction of the magnetic field to be determined all around the globe.

Dr Holme said: "This satellite mission will help us to measure precisely the magnetic signals from Earth's core, mantle, crust and oceans, as well as ionosphere and magnetosphere. What is new is to have multiple measurements in orbit at the same time but in different locations.

"This will allow us for the first time to distinguish directly between field sources internal and external to the Earth. The resulting models will give us an insight into Earth's interior and space weather."

Although invisible, the magnetic field and electric currents in and around Earth generate complex forces that have immeasurable impact on everyday life. The field can be thought of as a huge bubble, protecting us from cosmic radiation and charged particles that bombard Earth in 'solar winds'. This shield also protects the atmosphere, and so likely played an important role in the development of life on Earth.

As well as furthering science, the measurements delivered by the three Swarm satellites will be valuable for a range of applications including improving the accuracy of navigation systems and cartography, and improving the efficiency of prospecting and drilling for natural resources.

Provided by University of Liverpool