

Institute Lecture

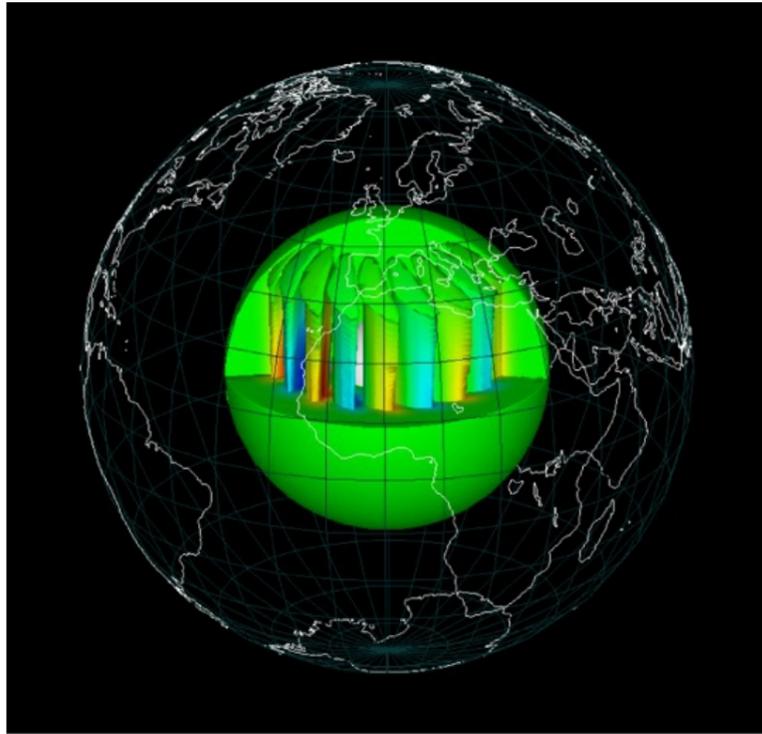
The origin of the Earth's magnetic field

Prof. Emmanuel Dormy

Senior researcher at National Center for Scientific Research (CNRS)
Professor, Ecole Normale Supérieure and Ecole Polytechnique in Paris



Tuesday, 1st April 2014, Time: 6.00 PM,
Venue: L-16, Lecture Hall Complex



Abstract

The origin of the Earth's magnetic field is a long-standing and apparently simple problem, which has captured the attention of many renowned scientists. William Gilbert, André-Marie Ampère, René Descartes, Edmond Halley, Karl-Friedrich Gauss, Lord Blackett, and many others who contributed to the development of science, have worked on this problem. It is mainly because it was related to a very practical issue of critical importance: navigation at sea. This is not so true anymore, now that satellites provide the precise latitude and longitude without the need for us to rely on the Earth's internal magnetism. Yet the question of the origin of the Earth's magnetic field is so natural that it is still the object of very competitive research. Nobody can ignore that the compass needle points toward the north, and it is

a bit irritating that we still cannot offer a complete physical understanding of why it is so.

The core of the Earth is mainly constituted of liquid iron in convection. The motion of such a conducting liquid can, under some circumstances, yield the generation of electrical currents, and therefore a magnetic field, through a mechanism called "self-excited dynamo action". We will introduce the basics of this mechanism, and will discuss how they can be applied to Earth.

The problem is an active field of fundamental research in which significant progress has been achieved in the last few years using combined theoretical, experimental and numerical approaches. By its very nature, the problem is interdisciplinary and lies at the interface of physics, geophysics and applied mathematics.

About the speaker

Prof. Emmanuel Dormy is one of the most eminent scientists in dynamo research and computational astrophysics. He has developed a famous dynamo code called "PARODY". Prof. Dormy is a senior researcher at the french National Center for Scientific Research (CNRS). He is a professor at the physics department of Ecole Normale Supérieure and in Ecole Polytechnique in Paris. He is the coordinator of GdR Dynamo.

Tea at 5.45 PM

All interested are welcome.

Amalendu Chandra
Dean of Research and Development