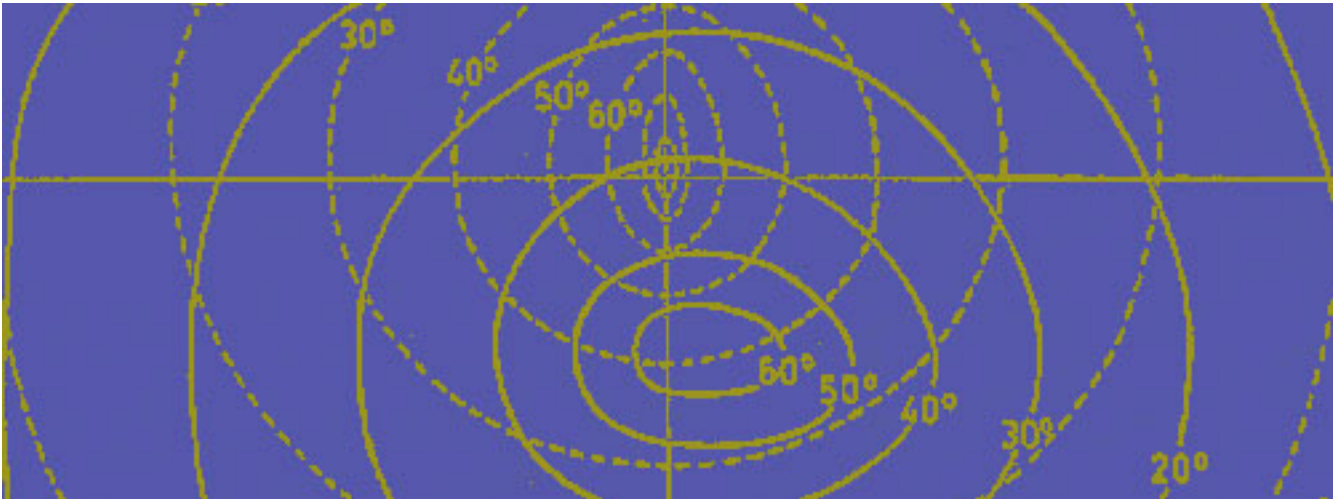




The Problem of Cosmic Radiation in Interplanetary Space



Before the discovery of cosmic rays by Victor Francis Hess on the eve of the First World War, and the almost simultaneous discovery of electromagnetic waves from space, visible light was the only way of observing the universe in which we live.

Since then, both discoveries have become powerful sources of information and both have contributed to a huge increase in the volume of our new knowledge.

In particular, the first of these discoveries has provided us with an effective means of studying interplanetary and deeper space.

The launch of artificial satellites and spacecraft equipped with highly sensitive measuring instruments has given new impetus to the study of cosmic rays before they reach the Earth and before they pass through the Earth's atmosphere.

This led to the discovery of radiation belts surrounding the Earth, which are composed of medium-energy particles captured by the geomagnetic field.

The emission of particles from the sun, which coincides mainly with the occurrence of large solar flares and which was discovered in experiments with high-altitude balloons, has been confirmed. Simultaneously, with the emission of electrically charged particles and other forms of radiation, the sun emits large plasma clouds that affect the Earth's external magnetic field and modulate the intensity of cosmic radiation.

All these discoveries have given rise to a large number of new problems.

The time is now ripe for a fruitful discussion of some of these new problems.

A crucial question is certainly to determine which are the solar, galactic and extra-galactic components of cosmic rays; in other words, which of them are truly cosmic rays (galactic or extra-galactic) and which are solar rays.

What are the criteria for distinguishing them from each other? What further research is needed to answer these questions? What is the relationship between the high intensity belts discovered by Van Allen and cosmic rays, as different from solar rays?

What is the influence of solar plasma on the Earth's external magnetic field? What is the mechanism of the modulation of the intensity of cosmic rays?

These are some of the issues that were discussed during this Study Week.

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