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Evaluation of the Project

"Research on Cosmic Matter on the Earth and in Space; Research on the Biological and Geochemical Specifics of the Early Earth"

In recent years, astrobiological research has been a rapidly developing field of modern science. The problem of the origin of life on Earth has always interested mankind, and it is becoming increasingly urgent. The establishment of the Astrobiology Sector at the Laboratory of Radiation Biology has given an additional impetus to research on this problem. The Sector coordinates astrobiological research in JINR Member States and other countries participating in the Project. The Sector is active in the following areas:

- research on microfossils and organic compounds in meteorites and ancient terrestrial rocks;
- research on the synthesis of complex prebiotic compounds from formamide under exposure to ionizing radiation in the presence of meteorite matter as a catalyst;
- biogeochemical studies of cosmic dust;
- studying cosmic matter with nuclear physics methods.

There is no doubt about the relevance of the research fields presented in the Project because they all form the basis of astrobiology. Such research enables a complex approach to the problem of the origin of life, its search in the Universe, and evaluation of the conditions of its existence on Earth and beyond.

Of special interest is the search for fossilized traces of life in meteorites. These studies broaden the knowledge of the abundance of life in the Universe. Over the past three years, the Astrobiology Sector's research has yielded the discovery of microorganisms of different groups in carbonaceous chondrite meteorites: prokaryotes (coccolid, rod-shaped, and filamentary forms) and eukaryotes (prasinophytes, alveolates, testate amoebae, and diatoms). Hardly can the importance of these results be overestimated as they support the theory of the extraterrestrial origin of life (panspermia). At least, it can be confidently believed that microorganisms exist beyond Earth.

This promising research does not diminish the significance of other fields of research conducted at the Astrobiology Sector. Studying the synthesis of prebiotic compounds allows a closer approach to the problem of the emergence of the first living structures on Earth and beyond. Research on cosmic matter, including cosmic dust, with nuclear physics methods yields valuable information on space, which is important not only to astrobiology but other disciplines, too.



The Sector's broad range of research has allowed it to become an international center of cutting-edge research in astrobiology. During its existence, the Sector has performed very fruitful work. Research results have been published in refereed journals and reported to international scientific conferences.

The Astrobiology Sector is cooperating with a number of leading foreign scientific organizations, including those of JINR Member States. The Mongolian Academy of Sciences expresses interest in joint research within the framework of the proposed Project and supports the prolongation of the theme "Research on Cosmic Matter on the Earth and in Space; Research on the Biological and Geochemical Specifics of the Early Earth."

Academician D. Regdel


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