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A NSFC Project: The Geomagnetic Field and Life

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The geomagnetic field (GMF) and life both emerged in the early Earth and have co-evolved to the present day. The spatial and temporal variations of the GMF have profoundly influenced the environment and biosphere. The NSFC's Outstanding Research Group Project "The Geomagnetic Field and Life" is dedicated to exploring this fundamental relationship through interdisciplinary research. We bring together leading experts from China in Earth sciences, biology, chemistry, and information science. Our integrated approach focuses on developing high-sensitivity magnetic instrumentation to conduct systematic, multi-scale studies. Core research objectives include: 1) correlating spatiotemporal geomagnetic variations with major events in the history of life, 2) characterizing changes in the palaeomagnetic field, 3) investigating the biological effects of magnetic fields, and 4) elucidating the cellular and molecular mechanisms of magnetoreception. This project aims to establish a theoretical framework for understanding how geomagnetic field variations have shaped Earth's habitable conditions and the evolution of life. It also seeks to advance applications of biomagnetic effects and biogenic magnetic nanomaterials. Ultimately, this project will provide new insights into the co-evolution of life and the geomagnetic environment.