

This book provides an interdisciplinary review of one of the great unsolved mysteries that has fascinated scientists for over 150 years: the origin of chirality in biomolecules.

Many theories have been put forward, some of them resting on solid ground, but all lacking definitive experimental evidence to back them up. Some postulate that the handedness of molecules in the biosphere arose by chance. Others rely on discovering life on similar planets and making comparisons with Earth. Alternative theories have emerged from a range of backgrounds including geology, biology, chemistry, physics and astronomy. Current advances in fields as diverse as space exploration, prebiotic chemistry and high-energy physics may help to provide an answer.

Important pieces of information will come from observations at the two frontiers of science: outer space and the subatomic world. Observation of distant planets, galaxies, and even actual sampling of celestial objects from beyond the solar system are projects currently underway. At the other end of the spectrum, there are experiments that will study the elemental properties of matter, such as symmetry, and interactions with the fundamental forces. All these efforts will render their fruits soon.

The Origin of Chirality in the Molecules of Life: A Revision from Awareness to the Current Theories and Perspectives of this Unsolved Problem unifies all the theories of the origin of biomolecular homochirality together in one source. The various chapters focus on chance mechanisms, physical forces such as the 'weak interaction', fluid dynamics, amplification of chirality, the organic contents of meteorites and comets and, finally, the physical view of an intrinsically asymmetric universe.

This complete, interdisciplinary review of an intriguing subject condenses a large and disparate range of contributions from journals in almost every scientific field. The various theories have been organized, interrelated and explained in a unified way. One of the book's strengths is its extensive use of graphic material to aid understanding the many subjects covered. It is fundamental, comprehensive and structured to be accessible for educational purposes.

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