

## Preface

The twentieth century will be remembered as the century of scientific revolutions. It started with the discoveries of physics, which revealed the fine structure of matter and the fundamental laws of nature. Then came cosmology, which traced the history of the Universe, from the Big Bang to the dizzying recession of myriad whirling galaxies. Finally, with the advances of biochemistry, cell biology, and molecular biology, life itself has disclosed its secrets.

These revolutions, in turn, have spawned new technologies – nuclear power, space travel, informatics, bioengineering – that could not even be conceived one century earlier; they have also opened new fields of inquiry that had been relegated before to the realm of the unknowable, objects only of gratuitous speculation or imaginative fiction. Among these new fields, the origin and evolution of life on Earth have become topics of intense theoretical and experimental research.

The latest offspring of this upheaval is exobiology, the science of extraterrestrial life, also known as astrobiology or bioastronomy. Of all branches of science, it is the most universal and all-encompassing, involving virtually every scientific discipline. It is also the emptiest, being so far without known object. No sign of life beyond our planet has yet been uncovered.

Whether or not its quest will one day be fulfilled, exobiology has already produced many valuable fruits and is bound to produce many more in the future. It has brought together and impelled physicists, chemists, cosmologists, astronomers, planetologists, geologists, paleontologists, biologists of all kinds, and other specialists who had until then labored each in the isolation of their individual disciplines to interact. It has stimulated many investigations that would otherwise have been performed with considerably less vigor, perhaps not at all. It has revealed a number of significant facts on the cosmic properties and interrelationships out of which life and mind emerged on our planet and may, perhaps, have done so elsewhere in our galaxy or in others. It has even alerted philosophers and theologians to a very real possibility that, only 400 years ago, was a heresy punishable by death. It has evoked new dreams in the collective imagination of humans who, ever since their distant ancestors started contemplating the skies, have asked the question: Is there life out there? Are there others like us elsewhere?

The present book is the outcome of a remarkable pluridisciplinary effort initiated by a group of French scientists and materialized already into two summer schools organized under the aegis of the CNRS, Exobio'99, in Propriano, Corsica (1999) and Exobio'01, in La Colle-sur-Loup, South of France (2001). The proceedings of these meetings are an invaluable source of information covering every aspect, from astronomy to molecular biology, likely to illuminate the exobiology problem. This exceptional documentation will now be generally available, thanks to the present work, in which most of the Exobio participants have summarized their contributions in a world-wide accessible form. As a participant myself, who, for personal reasons was unable to provide a chapter, I am particularly pleased and honored to have the opportunity to preface this truly unique compendium.

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