

Preface

Life in the Solar System and beyond is a subject that includes the study of life on Earth, but particularly the possibility of life elsewhere. It is of enormous interest and widespread significance, not least because of the progress that has been made in recent decades in our understanding of life on Earth, and of the potential for life existing elsewhere. At present, with no firm evidence as yet for extraterrestrial life, the study of life beyond the Earth is concerned with the location and study of possible habits, not only within the Solar System but outside it too. It is a wide-ranging subject, embracing aspects of all the core areas of science – astronomy, planetary science, chemistry, biology, and physics. This breadth is a challenge for authors and readers alike. Another challenge is the rapid pace of development of the subject, and it is hoped that the websites included in Resources at the end of the book will help us all keep up to date.

I have written a broad introduction to ‘life in the Universe’, a subject that is variously known as bioastronomy and astrobiology, though increasingly as the latter. The text is aimed at people with some background in science, though not much, given the breadth of science that astrobiology draws on. The readership could include science undergraduates, graduates with little previous knowledge of the field, and the interested non-specialist, including the amateur astronomer. A basic knowledge of atoms and the chemical elements will help, as will familiarity with graphs and with simple algebraic expressions and equations.

In studying the book it will benefit you to absorb the summaries at the end of each chapter – these are intended to encapsulate the main points to carry forward. There are also a few end of chapter questions. These are not comprehensive in their coverage, but are intended to illustrate how various topics can be progressed – they require more than recall. Full answers are given at the back of the book to all the questions set.

The chapters are arranged as follows. Chapter 1 is a broad introduction to the cosmos, with an emphasis on where we might find life out there. In Chapters 2 and 3

we discuss life on Earth, the one place we know to be inhabited, which provides us with an essential guide in our search. Chapter 4 is a brief tour of the Solar System, leading us in Chapters 5 and 6 to two promising potential habitats, Mars and Europa. Each of these worlds, and their exploration for life now or in the past, has separate chapters devoted to them. In Chapter 7 we meet the fate of life in the Solar System, which gives us extra reason to consider life further afield. Chapter 8 focuses on the types of stars that might host habitable planets, and where in the Galaxy these might be concentrated. Chapters 9 and 10 describe the instruments and techniques being employed to discover planets of other stars (exoplanetary systems), and those that will be employed in the near future. In Chapter 11 a summary is given of the known exoplanetary systems, and an outline of the sort of systems we expect to discover soon, particularly those containing habitable planets. Chapter 12 describes how we will attempt to find life on these planets, and Chapter 13, the final chapter, brings us to the search for extraterrestrial intelligence, to where we wonder whether we are alone.



<http://www.springer.com/978-1-85233-101-6>

Life in the Solar System and Beyond

Jones, B.W.

2004, XXV, 317 p., Softcover

ISBN: 978-1-85233-101-6