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Sinopsis

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Dynamical evolution over long time scales is a prominent feature of all the systems we intuitively think of as complex -- for example, ecosystems, the brain or the economy. In physics, the term ageing is used for this type of slow change, occurring over time scales much longer than the patience, or indeed the lifetime, of the observer. The main focus of this book is on the stochastic processes which cause ageing, and the surprising fact that the ageing dynamics of systems which are very different at the microscopic level can be treated in similar ways.
The first part of this book provides the necessary mathematical and computational tools and the second part describes the intuition needed to deal with these systems. Some of the first few chapters have been covered in several other books, but the emphasis and selection of the topics reflect both the authors' interests and the overall theme of the book. The second part contains an introduction to the scientific literature and deals in some detail with the description of complex phenomena of a physical and biological nature, for example, disordered magnetic materials, superconductors and glasses, models of co-evolution in ecosystems and even of ant behaviour. These heterogeneous topics are all dealt with in detail using similar analytical techniques.

This book emphasizes the unity of complex dynamics and provides the tools needed to treat a large number of complex systems of current interest. The ideas and the approach to complex dynamics it presents have not appeared in book form until now.

Readership: Graduates and researchers with an interest in complex systems