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Sommario/riassunto

This book aims to provide mathematical analyses of nonlinear differential equations, which have proved pivotal to understanding many phenomena in physics, chemistry and biology. Topics of focus are autocatalysis and dynamics of molecular evolution, relaxation oscillations, deterministic chaos, reaction diffusion driven chemical pattern formation, solitons and neuron dynamics. Included is a discussion of processes from the viewpoints of reversibility, reflected by conservative classical mechanics, and irreversibility introduced by the dissipative role of diffusion. Each chapter presents the su