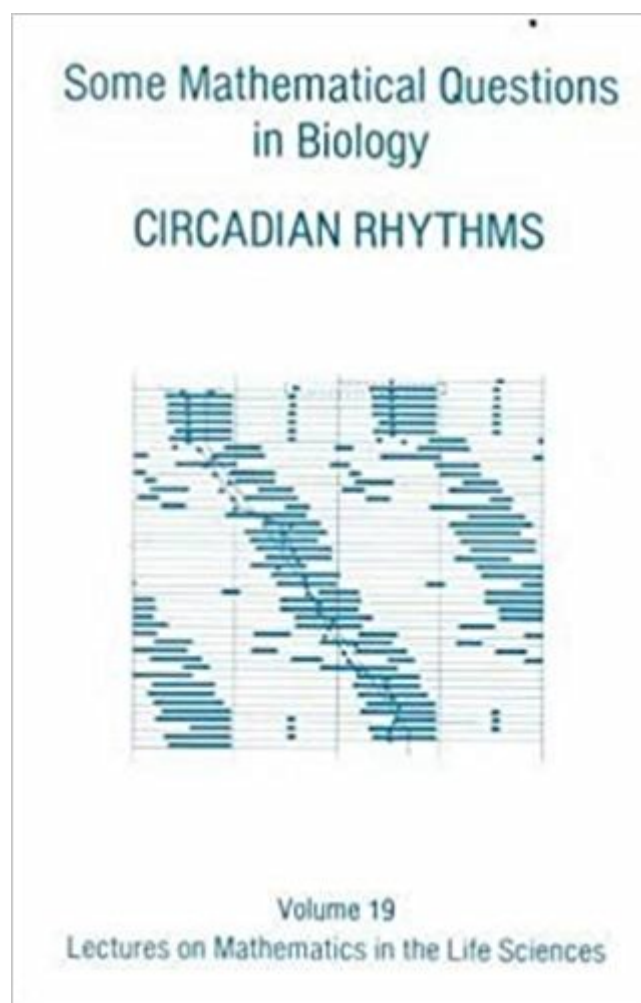




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Some Mathematical Questions In Biology: Circadian Rhythms (Lectures In Mathematics In The Life Sciences, Vol 19)



Synopsis

The articles in this collection are based on lectures given at the 20th Annual Symposium on Some Mathematical Questions in Biology, held in May 1986, and sponsored jointly by the AMS, the Society for Industrial and Applied Mathematics, and Section A of the American Association for the Advancement of Science. For the past thirty years, due particularly to the fundamental work of Pittendrigh, Aschoff, and Wever, theoretical analysis of circadian rhythms and sleep have gone hand in hand with experimental and clinical studies. Circadian rhythms have been investigated at levels ranging from cell fragments to humans, from biochemistry to behavior. This experimental diversity is reflected in a diversity of modeling approaches, several of which are represented in this collection. One class of models focuses on the circadian sleep and activity cycles of humans, for which some investigators postulate pacemaker systems with two coupled oscillators, while others propose single oscillator models. Other analyses focus upon the activity patterns of small vertebrates or upon anatomical data and physiological recordings. The mathematical formulations and analyses utilize nonlinear dynamical systems, stochastic models, and computer simulations. The articles in this volume discuss, analyze, and compare these various experimental, theoretical, and mathematical approaches.

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