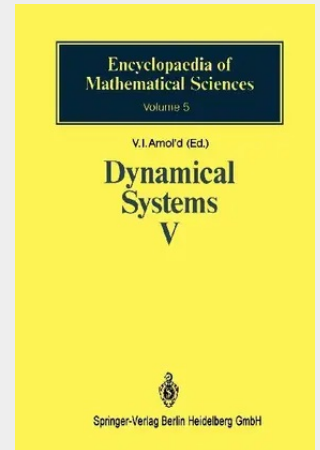


Dynamical Systems V

Bifurcation Theory and Catastrophe Theory

Bifurcation theory and catastrophe theory are two well-known areas within the field of dynamical systems. Both are studies of smooth systems, focusing on properties that seem to be manifestly non-smooth. Bifurcation theory is concerned with the sudden changes that occur in a system when one or more parameters are varied. Examples of such are familiar to students of differential equations, from phase portraits. Understanding the bifurcations of the differential equations that describe real physical systems provides important information about the behavior of the systems. Catastrophe theory became quite famous during the 1970's, mostly because of the sensation caused by the usually less than rigorous applications of its principal ideas to "hot topics", such as the characterization of personalities and the difference between a "genius" and a "maniac". Catastrophe theory is accurately described as singularity theory and its (genuine) applications. The authors of this book, previously published as Volume 5 of the Encyclopaedia, have given a masterly exposition of these two theories, with penetrating insight.

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