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Título: Invariant Manifolds In Discrete And Continuous Dynamical Systems

Autor: Kaspar Nipp And Daniel Stoffer, Eth Zürich, Switzerland **Precio:** Desconocido

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In this book, dynamical systems are investigated from a geometric viewpoint. Admitting an invariant manifold is a strong geometric property of a dynamical system. This text presents rigorous results on invariant manifolds and gives examples of possible applications.

In the first part, discrete dynamical systems in Banach spaces are considered. Results on the existence and smoothness of attractive and repulsive invariant manifolds are derived. In addition, perturbations and approximations of the manifolds and the foliation of the adjacent space are treated. In the second part, analogous results for continuous dynamical systems in finite dimensions are established. In the third part, the theory developed is applied to problems in numerical analysis and to singularly perturbed systems of ordinary differential equations.

The mathematical approach is based on the so-called graph transform, already used by Hadamard in 1901. The aim is to establish invariant manifold results in a simple setting that provides quantitative estimates.

The book is targeted at researchers in the field of dynamical systems interested in precise theorems that are easy to apply. The application part might also serve as an underlying text for a student seminar in mathematics.

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Readership

Researchers interested in dynamical systems.

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