



Mathematics is playing an ever more important role in engineering, computational science and the physical and biological sciences, blurring the boundaries between scientific disciplines and a resurgence of interest in the modern as well as the classical techniques of applied mathematics. This is coupled with the mathematization of many aspects of these other areas. The revitalization of contact between mathematics and other fields has led to the establishment of the series:

Interdisciplinary Applied Mathematics (IAM).

The development of new research tools and techniques is a natural consequence of a high level of excitement on the research frontier as newer methods, such as numerical and symbolic computer systems, symmetry techniques, and coherent and chaotic dynamical systems mix with and reinforce the traditional methods of applied mathematics. Thus, the purpose of this series is to meet the current and future needs of these advances and encourage their use in other disciplines.

IAM will include books which represent a balanced meeting of mathematics and other areas of science and technology as distinct from the AMS (Applied Mathematical Sciences) series which primarily focuses on applications of well developed areas of mathematics. Hence, books published in the **IAM** series will indicate how existing mathematics may be applied, and will raise many interesting questions ripe for mathematical development.

A new Series: ***Interdisciplinary Applied Mathematics***

Editors: **F. John, L.P. Kadanoff, J.E. Marsden, L. Sirovich, S. Wiggins**

M.C. Gutzwiller, IBM T.J. Watson Research Center, Yorktown Heights, NY

Chaos in Classical and Quantum Mechanics

1990. Approx. 430 pp. 78 figs. Hardcover DM 68,- ISBN 3-540-97173-4

Contents: Introduction.— The Mechanics of Language.— The Mechanics of Hamilton and Jacobi.— Integrable Systems.— The Three-Body Problem: Moon-Earth-Sun.— Three Methods of Solution.— Periodic Orbits.— The Surface of Solution.— Models of the Galaxy and of Small Molecules.— Soft Chaos and the KAM Theorem.— Entropy and Other Measures of Chaos.— The Anisotropic Kepler Problem.— The Transition From Classical to Quantum Mechanics.— The New World of Quantum Mechanics.— The Quantization of Integrable Systems.— Wave Functions in Classically Chaotic Systems.— The Energy Spectrum of a Classically Chaotic System.— The Trace Formula.— The Diamagnetic Kepler Problem.— Motion on a Surface of Constant Negative Curvature.— Scattering Problems, Coding and Multifractal Invariant Measures.— Reference.— Index.

