Preface

The field of Nonlinear Dynamics and Complex Systems is a very active research field in which many scientists from many different fields are contributing to its growth and development.

Among the many different and interesting problems covered in this field, we mention those in chaotic dynamics, which manifest themselves in many different scenarios in the natural and technical sciences. And the attempts of scientists to control this chaotic dynamics has contributed to a research line known as chaos control. Research on chaos control was strongly influenced by the seminal paper of Edward Ott, Celso Grebogi and James Yorke. This paper was chosen by the American Physical Society as a milestone in the last fifty years. It opened up a whole new area of research, changing philosophically our way of thinking about chaos. Previously, it was strongly believed by scientists that chaos was intrinsically uncontrollable. We understand now that chaos not only can be controlled and manipulated but that chaos can give a great inherent flexibility in choosing a large number of controllable states by applying tiny perturbations to the system under consideration. Since that publication, a lot of progress has been done in this topic, through the implementation of different techniques and algorithms with a lot of applications as well.

This present book, *Recent Progress in Controlling Chaos*, contains 15 contributions of world-renowned scientists and experts in the field of controlling chaos, and the editors of this volume are well known scientists in the field of Nonlinear Dynamics, Chaos and Complex Systems, in particular, Chaos Control. Among the topics covered are techniques used for the reduction of chaotic transport in magnetized plasmas, methods of control applied to chaotic neural networks, different methods of adaptive feedback, pulsive and delayed feedback control techniques, phase control technique, applications of control techniques to traffic, mechanical structures and neuron networks, the method of partial control of chaos useful for

controlling transient chaos in presence of noise and certain applications to celestial mechanics.

Our main goal is to offer readers a broad view of the more recent progress in the field. Besides the progress in key techniques and concepts in the field of control, some of the contributions are also very useful for those who look for applications in Science and Technology. The contributors have been carefully selected and include researchers from different areas and background. Some authors come from a more fundamental and basic background while others, a more applied and engineering background.

The book will certainly be of much use for graduate students and scientists working in Nonlinear Dynamics, Chaos and Complex Systems, in general. It provides the attractiveness for the study of the complex nonlinear systems and it brings new results and ideas to students and researchers.

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Editors
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