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# Preface

This volume contains invited lectures and posters presented at the international symposium "Oscillation, Chaos and Network Dynamics in Nonlinear Science," held in Kyoto, Japan, from November 25 to 28, 2004.

Nonlinear oscillations, whether periodic or chaotic, appear widely in systems driven far from thermal equilibrium. The theory of nonlinear oscillations is relevant to many fields, including physics, chemistry, biology, engineering, neuroscience and the social sciences. Of particular interest and importance is to understand how coherent synchronous activity is generated and collapses in networks of interacting oscillatory elements, and in what way the resulting behavior is functionally relevant. Research along this line could also lead to new applications in diverse fields of science and technology, and therefore it is not surprising that the field of "coupled oscillators" has recently been attracting increasing numbers of researchers worldwide.

The purpose of this international workshop was to bring together experts and general researchers in this field to explore new directions in this fascinating area of science for the 21st century. The main topics of the workshop were the collective dynamics arising from mutual synchronization and its breakdown, pattern dynamics in regular and random oscillatory media, and applications of the concepts arising from such studies to more complex systems, such as the brain, ecological systems and human societies. Each invited lecture was followed by active discussions, and many of the poster presentations given by young researchers were of impressively high quality. We invited those who participated in OCNN2004 to submit papers for these proceedings reporting their latest results. All the manuscripts were carefully reviewed by experts in the respective fields.

On behalf of the organizing committee, we would like to thank the 21st century COE program "Center for Diversity and Universality in Physics", Kyoto University and the Inoue Foundation of Science for their financial support. The assistance of many student volunteers, without which the workshop would not have been possible, is also gratefully acknowledged.

October 2005

Yoshiki Kuramoto
Shigeru Shinomoto
Hiroya Nakao
Takao Ohta

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