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**D**

**NONLINEAR PHENOMENA**

# Progress in Chaotic Dynamics

*Essays in honor of  
Joseph Ford's 60th birthday*

Editors:

Hermann Flaschka  
Boris Chirikov

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VOLUME 33, 1988

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# Progress in Chaotic Dynamics

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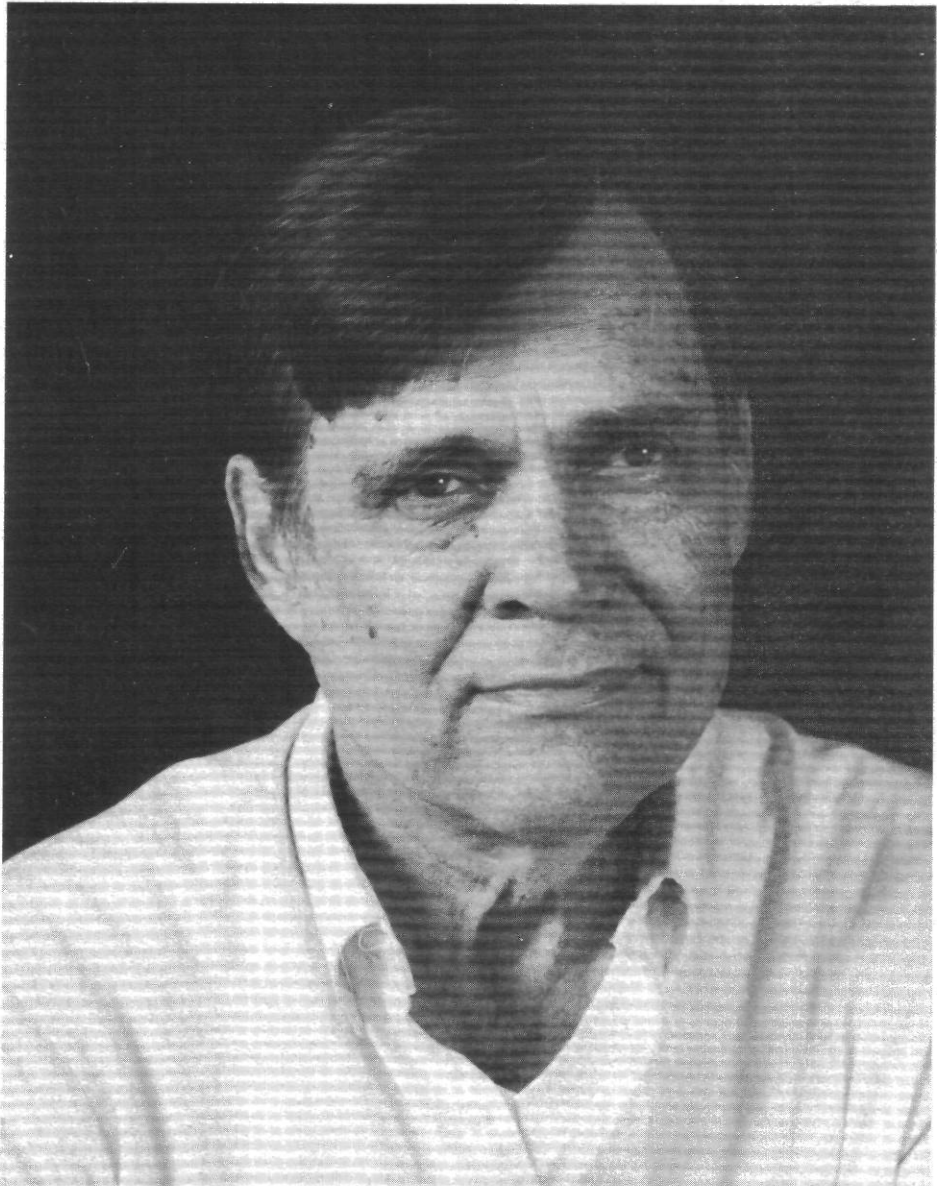
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Professor Joseph Ford

Photograph: Vincent Mallette, Georgia Institute of Technology

## PREFACE

It is a great pleasure for us to dedicate this special issue of *Physica D* to Joseph Ford on the occasion of his sixtieth birthday. It seems particularly appropriate to use the pages of this journal, which Joe helped found eight years ago, to express our appreciation for his work.

This is not merely a recognition of Joe's contributions to the field of nonlinear dynamics. It is a tribute to a colleague whose scientific life has been dedicated to forming, developing, and guiding our scientific community. It is also a present to a friend whose generosity and kindness we have admired, and whose sense of humor we have, so many times, enjoyed.

Joe Ford came to the new field of chaotic dynamics after having been diverted from 'conventional' statistical mechanics by the famous Fermi–Pasta–Ulam problem. As early as 1963, he discovered a novel phenomenon, a transition from ordered motion to stochasticity. In those pioneering days, Joe sensed, more than anyone else, the profundity and significance of the new dynamics. As related ideas emerged from diverse fields, he served as catalyst and focal point for the new developments.

A prolific period followed. We just recall his empirical criterion for chaos, based on local instability of motion, his computer proof of the integrability of the Toda lattice, which stimulated intensive investigations of integrable equations, and his study of chaos in systems that can be arbitrarily close to linear oscillators.

As the literature of dynamics began to grow, Joe conceived the Nonlinear Science Abstracts. He collected, organized, typed, copied, and distributed volumes of abstracts of dynamics papers, and thereby made new theory and new applications available to an interdisciplinary audience. We thank Joe for all the days spent at the typewriter, and for all the weekends with the photocopy machine.

As new researchers rushed into nonlinear dynamics, Joe retreated into lonelier domains, to explore deeper consequences of deterministic chaos. He realized that the concept of chaos transcends the domains of mappings and differential equations, and drew attention to the notion of algorithmic complexity as a means of defining and assessing the limits of our ability to deal with chaotic systems.

With this tool, he began daring investigations in a field which would come to be called Quantum Chaos. He perceived that such chaos does not exist at all, and unlike others who wished to explore the Quantum maze, he challenged quantum mechanics itself.

A very good start for the first half-century or so, Joe. Forward and good luck!

*Giulio Casati*  
*Boris Chirikov*  
*Hermann Flaschka*  
*Franco Vivaldi*

who are responsible for this Foreword  
and all the people who filled the  
rest of this volume.



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