

## Preface

*Stochastic resonance* is a term which describes the coincidence of two time scales in a periodically stimulated, multistable, stochastic system. One time scale is established by the period of the external stimulus and the other by the well-to-well switching rate induced by the stochastic process or “noise.” Stochastic resonance theory was born over a decade ago in the course of efforts to discover the mechanism which accounts for the observed periodicities in the recurrences of the earth’s ice ages. Since that time, a wealth of experimental and theoretical evidence has been accumulated which indicates that information transmission through such “noisy” systems is optimized when the two characteristic times become equal. Moreover, the phenomenon of noise-induced switching—a necessary ingredient for stochastic resonance—is generic enough to find applications in a wide variety of physicochemical and even biological systems. In view of the high degree of current interest in the phenomenon, together with strong indications that new applications, especially in biology and in quantum tunneling, are eminent, it seemed obvious that the time had arrived for the first international workshop on the subject.

The workshop was held at the Travelodge Hotel on Point Loma in San Diego, California, during 30 March–3 April 1992. It was attended by over 80 speakers and participants representing 11 different countries. In addition to the 40 featured lectures, three evening poster sessions were held. Interest in these scientific sessions was embellished by the spectacular victory of Italy over New Zealand in the America’s Cup yacht race which was being run concurrently off Point Loma.

This special issue of the *Journal of Statistical Physics* is a collection of research papers written by the featured speakers of the workshop. These authors were requested to prepare papers which not only would report new research results currently emerging from their laboratories, but also would include a concise review-tutorial as an introduction. It is our hope that this volume will therefore not only be useful as a current research tool, but also serve as an introduction to the subject for both students and researchers alike.

We are grateful to the U.S. Navy’s Laboratory NCCOSC (formerly

the Naval Ocean Systems Center) for providing an administrative home for the workshop as well as for substantial financial support. We are especially grateful to Dr. Frank Gordon of NCCOSC for his interesting and enlightening opening remarks as well as for his constant encouragement and enthusiastic support throughout the planning stages and during the workshop itself. Additional substantial financial support was provided by the North Atlantic Treaty Organization, which sponsored the meeting as an Advanced Research Workshop, and by the U.S. Office of Naval Research, which provided the initial encouragement as well as continuing assistance throughout. Finally, the organizers as well as the participants are extremely grateful to Louise Stewart for availing us of her considerable organizational talents and for competently, cheerfully, and efficiently solving the myriad problems which arise during such a meeting.

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