Resonances, Instability, and Irreversibility

Edited by

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In Resonances, Instability, and Irreversibility: The Liouville Space Extension of Quantum Mechanics T. Petrosky and I. Prigogine Unstable Systems in Generalized Quantum Theory E. C. G. Sudarshan, Charles B. Chiu, and G. Bhamathi Resonances and Dilatation Analyticity in Liouville Space Erkki J. Brandas Time, Irreversibility, and Unstable Systems in Quantum Physics E. Eisenberg and L. P. Horwitz Quantum Systems with Diagonal Singularity I. Antoniou and Z. Suchanecki Nonadiabatic Crossing of Decaying Levels V. V. and VI. V. Kocharovsky and S. Tasaki Can We Observe Microscopic Chaos in the Laboratory? Pierre Gaspard Proton Nonlocality and Decoherence in Condensed Matter -- Predictions and Experimental Results C. A. Chatzidimitriou-Dreismann "We are at a most interesting moment in the history of science. Classical science emphasized equilibrium, stability, and time reversibility. Now we see instabilities, fluctuations, evolution on all levels of observations. This change of perspective requires new tools, new concepts. This volume invites the reader not to an enumeration of final achievements of contemporary science, but to an excursion to science in the making." --from the Foreword by I. Prigogine What are the dynamical roots of irreversibility? How can past and future be distinguished on the fundamental level of description? Are human beings the children of time --or its progenitors? In recent years, a growing number of chemists and physicists have agreed that the solution to the problem of irreversibility requires an extension of classical and quantum mechanics. There is, however, no consensus on which direction this extension should take to include the dynamical description of irreversible processes. Resonances, Instability, and Irreversibility surveys recent attempts --both direct and indirect --to address the problem of irreversibility. Internationally recognized researchers report on their recent studies, which run the gamut from experimental to highly mathematical. The subject matter of these papers falls into three categories: classical systems with emphasis on chaos and dynamical instability, resonances and unstable quantum systems, and the general problem of irreversibility. Presenting the cutting edge of research into some of the most compelling
questions that face contemporary chemical physics, Resonances, Instability, and Irreversibility is fascinating reading for professionals and students in every area of the discipline.

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