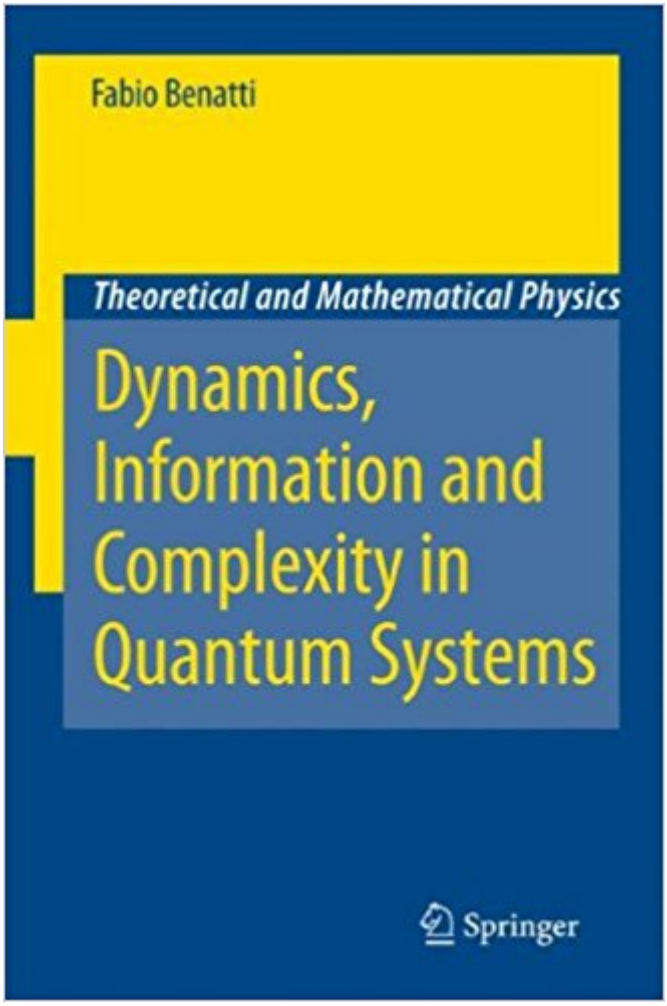
Dynamics, Information And Complexity In Quantum Systems (Theoretical And Mathematical Physics)



Synopsis

This book offers a self-contained overview of the entropic approach to quantum dynamical systems. In it, complexity in quantum dynamics is addressed by comparison with the classical ergodic, information, and algorithmic complexity theories.

Book Information

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Customer Reviews

From the reviews: â œThis book fits very well with the recent trends in theoretical and mathematical physics exploiting the interrelations between quantum theory, statistical mechanics and information theory. â | The book is clearly written and contains a reasonable amount of elementary background material illustrated by numerous examples, and therefore can serve very well students at the graduate level and researchers entering the field of quantum dynamics and quantum information.â • (Robert Alicki, Mathematical Reviews, Issue 2010 c)

The leading theme of the book is complexity in quantum dynamics. This issue is addressed by comparison with the classical ergodic, information and algorithmic complexity theories. Of particular importance is the notion of Kolmogorov-Sinai dynamical entropy and of its inequivalent quantum extensions formulated by Connes, Narnhofer and Thirring on one hand and Alicki and Fannes on the other. Their connections with extensions to quantum systems of Kolmogorov-Chaitin-Solomonoff algorithmic complexity theory is also presented. The technical tools employed are those of the algebraic approach to quantum statistical mechanics which offers a unifying view of classical and

quantum dynamical systems. Proofs and examples are provided in order to make the presentation self consistent.

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