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Classical Nonintegrability, Quantum Chaos

By Knauf, Andreas / Sinai, Yakov G.

Book Condition: New. Publisher/Verlag: Springer, Basel | With a contribution by Viviane Baladi | Our DMV Seminar on ‘Classical Nonintegrability, Quantum Chaos’; intended to introduce students and beginning researchers to the techniques applied in nonintegrable classical and quantum dynamics. Several of these lectures are collected in this volume. The basic phenomenon of nonlinear dynamics is mixing in phase space, leading to a positive dynamical entropy and a loss of information about the initial state. The nonlinear motion in phase space gives rise to a linear action on phase space functions which in the case of iterated maps is given by a so-called transfer operator. Good mixing rates lead to a spectral gap for this operator. Similar to the use made of the Riemann zeta function in the investigation of the prime numbers, dynamical zeta functions are now being applied in nonlinear dynamics. In Chapter 2 V. Baladi first introduces dynamical zeta functions and transfer operators, illustrating and motivating these notions with a simple one-dimensional dynamical system. Then she presents a commented list of useful references, helping the newcomer to enter smoothly into this fast-developing field of research. Chapter 3 on irregular scattering and Chapter 4 on quantum chaos...



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