

High-dimensional Chaotic And Attractor Systems

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This is a graduate level monographic textbook devoted to understanding, prediction and control of high dimensional chaotic and attractor systems of real life. The objective of the book is to provide the serious reader with a serious scientific tool that will enable the actual performance of competitive research in high dimensional chaotic and attractor dynamics. The book has nine Chapters. The first Chapter gives a textbook-like introduction into the low-dimensional attractors and chaos. This Chapter has an inspirational character, similar to other books on nonlinear dynamics and deterministic chaos. The second Chapter deals with Smale's topological transformations of stretching, squeezing and folding (of the system's phase space), developed for the purpose of chaos theory. The third Chapter is devoted to Poincaré's 3-body problem and basic techniques of chaos control, mostly of Ott-Grebogi-Yorke type. The fourth Chapter is a review of both Landau's and topological phase transition theory, as well as Haken's synergetics. The fifth Chapter deals with phase synchronization in high-dimensional chaotic systems. The sixth Chapter presents high-tech Josephson junctions, the basic components for the future quantum computers. The seventh Chapter deals with fractals and fractional Hamiltonian dynamics. The 8th Chapter gives a review of modern techniques for dealing with turbulence, ranging from the parameter space of the Lorenz attractor to the Lie symmetries. The last, 9th, Chapter attempts to give a brief on the cutting edge techniques of the high-dimensional nonlinear dynamics (including geometries, gauges and solitons, culminating into the chaos field theory). EAN/ISBN : 9781402054563 Publisher(s): Springer Netherlands Format: ePub/PDF Author(s): Ivancevic, Vladimir G. - Ivancevic, Tijana T.

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