While in the first part of the book stochastic descriptions of anomalous transport were highlighted, Part 2 focuses on deterministic theories. It thus explores the consequences of specific types of nonlinearities in the microscopic equations of motion leading to anomalous transport on macroscopic scales. The currently emerging theory of *Dynamical systems and deterministic transport* as applied to anomalous dynamics can particularly be worked out for low-dimensional models. Part 2 outlines foundations of this approach in three chapters.

The first contribution by Roberto Artuso and Giampaolo Cristadoro introduces to *Deterministic (anomalous) transport* along the lines of the thermodynamic formalism. For simple models such deterministic techniques yield exact formulas of transport coefficients in terms of periodic orbits, which can be evaluated via cycle expansions. Interesting crosslinks to mathematical dynamical systems theory are provided by means of dynamical zeta functions. These methods are applied to simple (intermittent) one-dimensional maps. Similar models have already been studied by Eli Barkai in the last chapter of the previous Part 1 from a stochastic viewpoint. The chapter by Eduardo G. Altmann and Holger Kantz focuses on *Anomalous transport in Hamiltonian systems*. For low-dimensional Hamiltonian dynamics the hypothesis of strong chaos typically leading to normal transport is often violated. In such cases anomalous transport can occur, which in Hamiltonian systems is intimately related to the existence of a mixed phase space with stickiness of trajectories to KAM tori of periodic motion and long-time tails in corresponding observables. Deterministic diffusion in the standard map and tracer diffusion in simple models of incompressible fluids are discussed as examples. Applications of the continuous time random walk model as introduced in Part 1 of this book yields important insight into the exponents characterizing the anomalous deterministic transport of these systems. The third contribution by Stefano Lepri, Roberto Livi and Antonio Politi introduces to the problem of a microscopic description of heat transport in matter. Attempts to derive Fourier's law of (normal) heat condutction from first principles for simple models such as chains of harmonic oscillators first led to rather disappointing results. It turned out that *Anomalous heat conduction* is not the exception but rather the rule even if the oscillator chains are anharmonic. Lepri and colleagues outline the historical development of the problem, leading from Fourier's pioneering work over Boltzmann's and Peierls' groundbreaking contributions to the famous Fermi-Pasta-Ulam model. They classify basic models of harmonic and anharmonic oscillator chains by discussing their properties in terms of Green-Kubo formulas and mode coupling theory. The chapter finishes with anomalous heat conduction in Hamiltonian particle billiards, which establishes an interesting crosslink to models and problems touched upon in the previous two chapters.