The previous three parts of this book introduced to fundamentals of anomalous transport from theoretical points of view. The final Part 4 now connects these theoretical concepts with *Applications to complex systems and experimental results*. All systems studied in the following are complex in the sense that their overall properties cannot be deduced by simply taking the sum of the single parts. In terms of dynamics, here the complex interplay between the different ingredients leads to anomalous transport on large scales.

The first two chapters approach this theme still within a theoretical framework: *Superstatistics: Theoretical concepts and physical applications* by Christian Beck proposes a description of complex dynamics by a superposition of two different statistics, which models the situation where complexity emerges from the coupling of spatio-temporal inhomogeneous dynamics on different time scales. Applications of this theory identify anomalous transport in various real world data, from the dynamics of Lagrangian and defect turbulence over the statistics of cosmic rays to a superstatistical analysis of train delays. *Money circulation science – fractional dynamics in human mobility* by Dirk Brockmann samples human travel in the modern world by tracing the circulation of individual bank notes. Statistical analysis shows that human dispersal is an ambivalent, effectively superdiffusive process taking place on different spatiotemporal scales. This can be understood in terms of Lévy flights and continuous time random walk theory as introduced in Part 1 of this book. The last three contributions report anomalous transport properties directly observed in experiments: *Anomalous molecular displacement laws in porous media and polymers probed by nuclear magnetic resonance techniques* by Rainer Kimmich and coworkers reviews a set of NMR techniques, whose combined application covers an impressive range of about 15 decades in time. These experimental methods reveal anomalous molecular diffusion in a variety of complex systems such as bulk polymer melts, porous glasses and percolation model clusters. NMR methods are also used by Rustem Valiullin and Jörg Kärger for their study of *Anomalous molecular dynamics in confined spaces*. Probing molecular diffusion in crystalline zeolite nanopores reveals anomalous properties of single-file diffusion, where the mutual passage of guest molecules is prevented by small pore diameters. In randomly structured mesoporous glasses and silica a variety of phase transitions is studied such as freezing and melting, evaporation and condensation pointing towards diffusive anomalies in a wider sense. The book concludes with an exposition of anomalous molecular diffusion in cell biology: *Paradigm shift of the molecular dynamics concept in the cell mem-*

brane: high-speed single-molecule tracking revealed the partitioning of the cell membrane by Akihiro Kusumi and coworkers shows that there is anomalous transport in the plasma membrane of living biological cells. Results obtained by high-speed single-molecule tracking techniques demonstrate that the plasma membrane exhibits a complex structure being parceled up into different domains, which leads to non-Brownian diffusion between different compartments.