<<软物质物理导论>>

图书基本信息

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内容概要

This textbook was developed over a period of 10 years for the author'slecture on soft matter physics for both graduate and undergraduatestudents in the Physics Department of Fudan University.Soft matters are different from hard ones essentially due to former'srelatively weak interaction which is comparable to kBTrm(Trm=roomtemperature). It is this feature that results in the major characteristics ofsoft matters such as "strong reactions upon weak actions". This textbooknot only concentrates on the basic interactions inside soft matters in areductionist approach(Chap. 2, Chaps. 5 and 6), but also introduces theexploration works on the complexity of soft matters in methods of systemscience(Chap. 4). Soft matters is a bridge between hard matters andcomplex systems that show characteristics of deterministic chaos in nature.As a "model animal"(a mouse, if you prefer) in soft matters,electrorheological(ER) fluids are introduced. While the properties andmechanisms of static ER effect are summerized(Chap. 5), this textbookputs its emphasis on the dynamic ER effects(Chap.6). The Onsagerprinciple of least energy dissipation rate is adapted in the textbook to seehow it governs the Optimal paths of a system's deviation from andrestoration to equilibrium. As another model animal, granular media isintroduced(Chap. 7) to explain the thermodynamics of sands and itsdynamics such as compartmentalization, pattern formation, and granu!arflow. Since many soft matters consist of light atoms, neutron scatteringappears useful as, a powerful tool and is worth mentioning(Chap.3),especially when a splashing neutron source is being erected in China.Soft matter physics is full of unknowns(Chap. 1) as the subject is still at itsinfancy, making it highly attractive. If you like a challenging subject, youwill most certainly fall in love with soft matter physics at first sight!

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