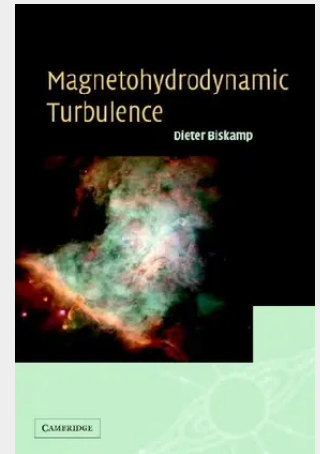


Magnetohydrodynamic Turbulence

This book presents an introduction to, and modern account of, magnetohydrodynamic (MHD) turbulence, an active field both in general turbulence theory and in various areas of astrophysics. The book starts by introducing the MHD equations, certain useful approximations and the transition to turbulence. The second part of the book covers incompressible MHD turbulence, the macroscopic aspects connected with the different self-organization processes, the phenomenology of the turbulence spectra, two-point closure theory, and intermittency. The third considers two-dimensional turbulence and compressible (in particular, supersonic) turbulence. Because of the similarities in the theoretical approach, these chapters start with a brief account of the corresponding methods developed in hydrodynamic turbulence. The final part of the book is devoted to astrophysical applications: turbulence in the solar wind, in accretion disks, and in the interstellar medium. This book is suitable for graduate students and researchers working in turbulence theory, plasma physics and astrophysics.

After a brief outline of magnetohydrodynamic theory, this introductory book discusses the macroscopic aspects of MHD turbulence, and covers the small-scale scaling properties. Applications are provided for astrophysical and laboratory systems. Magnetic turbulence is the natural state of most astrophysical systems, such as stellar convection zones, stellar winds or accretion discs. It is also found in laboratory devices, most notably in the reversed field pinch.



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