Accretion Flows in Astrophysics

- The book gives a systematic description of the standard model of disc accretion and also covers some topics beyond the standard model
- Discusses stationary and non-stationary, Newtonian and general-relativistic, flat and twisted discs
- Presents analytic theory for all the topics with detailed derivations
- Describes different applications of the theory explaining modern observational results obtained for astronomical sources, from close binary systems to quasars
- The principal author, Nikolay Shakura, is one of the founders of the disc accretion theory

This book highlights selected topics of standard and modern theory of accretion onto black holes and magnetized neutron stars. The structure of stationary standard discs and non-stationary viscous processes in accretion discs are discussed to the highest degree of accuracy analytic theory can provide, including relativistic effects in flat and warped discs around black holes. A special chapter is dedicated to a new theory of subsonic settling accretion onto a rotating magnetized neutron star. The book also describes supercritical accretion in quasars and its manifestation in lensing events. Several chapters cover the underlying physics of viscosity in astrophysical discs with some important aspects of turbulent viscosity generation. The book is aimed at specialists as well as graduate students interested in the field of theoretical astrophysics.