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## Theoretical Astrophysics

By Bartelmann, Matthias

Condition: New. Publisher/Verlag: Wiley-VCH | An Introduction | This book provides a comprehensive overview and introduces the basic theoretical concepts relevant for modern astrophysics. The book is structured in a modular way and can also be used by other researchers who want to refresh their memory of theoretical aspects in astrophysics. | Beginning from first principles and adopting a modular structure, this book develops the fundamental physical methods needed to describe and understand a wide range of seemingly very diverse astrophysical phenomena and processes. For example, the discussion of radiation processes including their spectra is based on Larmor's equation and extended by the photon picture and the internal dynamics of radiating quantum systems, leading to the shapes of spectral lines and the ideas of radiation transport. Hydrodynamics begins with the concept of phase-space distribution functions and Boltzmann's equation and develops ideal, viscous and magneto-hydrodynamics all from the vanishing divergence of an energy-momentum tensor, opening a natural extension towards relativistic hydrodynamics. Linear stability analysis is introduced and used as a common and versatile tool throughout the book. Aimed at students at graduate level, lecturers teaching courses in theoretical astrophysics or advanced topics in modern astronomy, this book with its abundant...



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