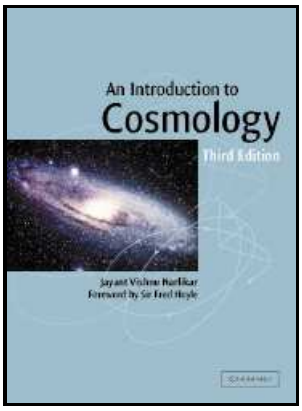
Introduction to the science of cosmology

Institute of Physics Pub. - Introduction to Cosmology



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General relativity (Physics)
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An Introduction To The Science Of Cosmology

Finally, the book considers some general issues raised by expansion and isotropy. The majority of pages are undamaged with minimal creasing or tearing, minimal pencil underlining of text, no highlighting of text, no writing in margins. The authors present the standard big bang theory of the universe and provide an introduction to current inflationary cosmology, emphasizing the underlying physics without excessive technical detail.

An Introduction to the Science of Cosmology

One chapter gives the main results of the hot big bang theory. It provides more detailed coverage than many other titles available, and the inclusion of problems at the end of each chapter aids in self study and makes the book suitable for taught courses.

An Introduction to the Science of Cosmology

A thorough introduction to modern ideas on cosmology and on the physical basis of the general theory of relativity, An Introduction to the Science of Cosmology explores various theories and ideas in big bang cosmology, providing insight into current problems. Raine Table of Content Preface RECONSTRUCTING TIME The patterns of the stars Structural relics Material relics Ethereal relics Cosmological principles Theories Problems EXPANSION The redshift The expanding universe The distance scale The Hubble constant The deceleration parameter The age of the universe The steady state theory The evolving universe Problems MATTER The mean mass density of the universe Determining the matter density The mean luminosity density The mass to luminosity ratios of galaxies The virial theorem The mass to luminosity ratios of rich clusters Baryonic matter Intracluster gas The gravitational lensing method The intercluster medium The non-baryonic dark matter Dark matter candidates The search for WIMPS Antimatter Appendix A: Derivation of the virial theorem Problems RADIATION Sources of background radiation The microwave background The hot big bang Radiation and expansion Nevertheless it moves The x-ray background Problems RELATIVITY Introduction Space geometry Relativistic geometry Isotropic and homogeneous geometry Other forms of the metric Open and closed spaces Fundamental or comoving observers Redshift The velocity-distance law Time dilation The field equations The dust universe The relationship between redshift and time Explicit solutions Models with a cosmological constant The radiation universe Light propagation in an expanding universe The Hubble sphere The particle horizon Alternative equations of state Problems MODELS The classical tests The Mattig relation The angular diameter - redshift test The apparent magnitude - redshift test The geometry of number counts: theory The timescale test The lensed quasar test Problems with big bang cosmology The flatness problem Alternative cosmologies Problems HOT BIG BANG Introduction Equilibrium thermodynamics The plasma universe The matter era The radiation era The era of equilibrium The GUT era: baryogenesis Photon to baryon ratio Nucleosynthesis The plasma

era Decoupling Recombination Last scattering Perturbations Appendix A: Thermal distributions Appendix B: The Saha Equation Appendix C: Constancy of? The next few chapters introduce relativistic cosmology and the classic observational tests. Cosmology is the scientific study of the large scale properties of the Universe as a whole.

An Introduction to the Science of Cosmology by Derek J. Raine

Includes sections on: Big Bang Theory, Big Bang Tests, Beyond the Big Bang, and Our Universe. One chapter gives the main results of the hot big bang theory. Beyond the level of many elementary books on cosmology, An Introduction to the Science of Cosmology encompasses numerous recent developments and ideas in the area.

An Introduction to the Science of Cosmology (Series in Astronomy and Astr

Finally, the book considers some general issues raised by expansion and isotropy. The first several chapters provide an introduction to the topics discussed later in the book. Next, the book presents the inflationary model and discusses the problem of the origin of structure and the correspondingly more detailed tests of relativistic models.

An Introduction to the Science of Cosmology

The next few chapters introduce relativistic cosmology and the classic observational tests. Assuming no previous knowledge of astronomy or cosmology, this book takes you beyond introductory texts to the point where you are able to read and appreciate the scientific literature, which is broadly referenced in the book.

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