

A PRIMER ON THE PHYSICS OF THE COSMIC MICROWAVE BACKGROUND

by Massimo Giovannini (CERN, Switzerland)

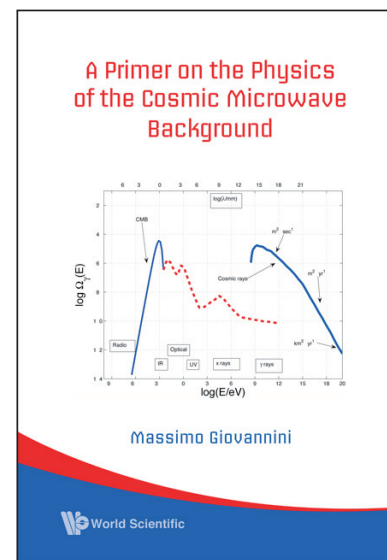
In the last fifteen years, various areas of high energy physics, astrophysics and theoretical physics have converged on the study of cosmology so that any graduate student in these disciplines today needs a reasonably self-contained introduction to the Cosmic Microwave Background (CMB). This book presents the essential theoretical tools necessary to acquire a modern working knowledge of CMB physics. The style of the book, falling somewhere between a monograph and a set of lecture notes, is pedagogical and the author uses the typical approach of theoretical physics to explain the main problems in detail, touching on the main assumptions and derivations of a fascinating subject.

Contents:

- Why CMB Physics?
- From CMB to the Standard Cosmological Model
- Problems with the SCM
- SCM and Beyond
- Essentials of Inflationary Dynamics
- Inhomogeneities in FRW Models
- The First Lap in CMB Anisotropies
- Improved Fluid Description of Pre-Decoupling Physics
- Kinetic Hierarchies
- Early Initial Conditions?
- Surfing on the Gauges
- Interacting Fluids
- Spectator Fields

Appendices:

- The Concept of Distance in Cosmology
- Kinetic Description of Hot Plasmas
- Scalar Modes of the Geometry
- Metric Fluctuations: Gauge Independent Treatment



Readership: PhD students and researchers in physics, astrophysics and astronomy.

Key Features

- Written in a reasonably self-contained manner so as to appeal to advanced undergraduate and graduate students
- Addresses the general motivations and principles that inspire modern searches of a common lore in gravitation, cosmology and high energy physics
- A collection of more advanced topics and informative references are included so as to guide the interested reader towards some active areas of current theoretical investigation

488pp

Mar 2008

978-981-279-142-9

US\$89

£48

981-279-142-6

