

<<宇宙膨胀和大尺度结构>>

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前言

The 1990s have seen substantial consolidation of theoretical cosmology, coupled with dramatic observational advances, including the emergence of an entirely new field of observational astronomy - the study of irregularities in the cosmic microwave background radiation. A key idea of modern cosmology is cosmological inflation, which is a possible theory for the origin of all structures in the Universe, including ourselves! The time is ripe for a new book describing this field of research. This book is based loosely on our 1993 Physics Reports article. We have widened the range of discussion and have made much of the material more pedagogical. We believe that this book will prove useful to starting graduate students in cosmology, to active researchers specializing in the field, and to all levels in between. Our view of the inflationary cosmology and its consequences has been influenced by many people over the years. ARL especially thanks Alfredo Henriques and Gordon Moorhouse for showing the way into this research area. DHL would like particularly to acknowledge a long term collaboration with Ewan Stewart. Much thanks is due to all our collaborators on the topics within this book, namely Mark Abney, Domingos Barbosa, Tiago Barreiro, John Barrow, Marco Bruni, Ted Bunn, Ed Copeland, Laura Covi, George Ellis, Mary Galliard, Juan Garcia-Bellido, Anne Green, Louise Griffiths, Ian Grivell, Rocky Kolb, Andrew Laycock, Jim Lidsey, Andrei Linde, Anupam Mazumdar, Milan Miji~, Manash Mukherjee, Hitoshi Murayama, Paul Parsons, Antonio Riotto, Dave Roberts, Leszek Roszkowski, Bob Schaefer, Franz Schunck, Douglas Scott, Qaisar Shaft, Ewan Stewart, Will Sutherland, Michael Turner, Pedro Viana, David Wands, Martin White, and Andrzej Woszczyna. Apart from our collaborators, we have had useful conversations with many others, far too many to mention. We hope they know who they are! We are extremely grateful to Andrei Linde, Martin White, and especially Gordon Moorhouse for their careful reading of the manuscript. The figures for Chapter 12 were made by Pedro Viana, and the compilation of cosmic microwave background anisotropy data shown in Figures 5.9 and 9.2 was kindly provided by Martin White. Many figures were made using the superb publically available CMBFAST code (Seljak and Zaldarriaga 1996), which we strongly recommend everyone to get. Although we wrote most of the book at our home institutes, occasionally we were some where more glamorous. ARL would like to thank the Universit di Padova, the University of New South Wales, and the Aspen Center for Physics, and DHL the University of California at Berkeley. ARL acknowledges the generous support of the Royal Society throughout this endeavour.

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内容概要

The 1990s have seen substantial consolidation of theoretical cosmology, coupled with dramatic observational advances, including the emergence of an entirely new field of observational astronomy - the study of irregularities in the cosmic microwave background radiation. A key idea of modern cosmology is cosmological inflation, which is a possible theory for the origin of all structures in the Universe, including ourselves! The time is ripe for a new book describing this field of research.

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<<宇宙膨胀和大尺度结构>>

书籍目录

Frequently used symbols Preface

1 INTRODUCTION 1.1 This book 1.2 The Universe we see 1.3 Overview: From cosmological inflation to large-scale structure 1.4 Notes on examples

2 THE HOT BIG BANG COSMOLOGY 2.1 The expanding Universe 2.2 Epochs 2.3 Scales 2.4 The cosmic microwave background 2.5 Ingredients for a model of the Universe 2.6 History of our Universe Examples

3 INFLATION 3.1 Motivation for inflation 3.2 Inflation in the abstract 3.3 Scalar fields in cosmology 3.4 Slow-roll inflation 3.5 Exact solutions 3.6 Hamilton-Jacobi formulation of inflation 3.7 Inflationary attractor 3.8 Reheating: Recovering the Hot Big Bang 3.9 Thermal inflation Examples

4 SIMPLEST MODEL FOR THE ORIGIN OF STRUCTURE I 4.1 Introduction 4.2 Sequence of events 4.3 Gaussian perturbations 4.4 Density perturbation: Newtonian treatment 4.5 The Baryon density contrast: Newtonian treatment 4.6 Cosmological perturbation theory 4.7 Evolution equations 4.8 Outside the horizon 4.9 Peculiar velocity in the relativistic domain Examples

5 SIMPLEST MODEL FOR THE ORIGIN OF STRUCTURE II 5.1 From horizon entry to galaxy formation 5.2 The cosmic microwave background anisotropy 5.3 Polarization 5.4 Reionization Examples

6 EXTENSIONS TO THE SIMPLEST MODEL 6.1 Modifying the cold dark matter hypothesis 6.2 Λ CDM model 6.3 Open CDM model 6.4 Fine tuning issues 6.5 Gravitational waves 6.6 Isocurvature perturbations Examples

7 SCALAR FIELDS AND THE VACUUM FLUCTUATION 7.1 Classical scalar field 7.2 Quantized free scalar field in fiat space-time 7.3 Several scalar fields 7.4 Vacuum fluctuation of inflaton field 7.5 Spectrum of the primordial curvature perturbation 7.6 Beyond the slow-roll approximation 7.7 Gravitational waves 7.8 Generating an isocurvature perturbation 7.9 A multicomponent inflaton? Examples

8 BUILDING AND TESTING MODELS OF INFLATION 8.1 Overview 8.2 Form of the scalar field potential 8.3 Single-field models 8.4 Hybrid inflation models 8.5 The spectral index as a discriminator 8.6 Models from extended theories of gravity 8.7 Open inflation models Examples

9 THE COSMIC MICROWAVE BACKGROUND 9.1 Large angles and the cosmic background explorer (COBE) satellite 9.2 Degree-scale observations and acoustic oscillations 9.3 Aspects of microwave anisotropy satellites Examples

10 GALAXY MOTIONS AND CLUSTERING 10.1 Clustering of galaxies 10.2 Galaxy velocities Examples

11 THE QUASI-LINEAR REGIME 11.1 Gravitational collapse 11.2 Press-Schechter theory 11.3 Theory of peaks 11.4 Numerical simulations 11.5 Applications of Press-Schechter theory 11.6 Reionization of the Universe Examples

12 PUTTING OBSERVATIONS TOGETHER 12.1 Observations 12.2 Critical-density models 12.3 Low-density models 12.4 Other options 12.5 Summary

13 OUTLOOK FOR THE FUTURE

14 ADVANCED TOPIC: COSMOLOGICAL PERTURBATION THEORY 14.1 Special relativity 14.2 Fluid flow in special relativity 14.3 Special relativity using generic coordinates 14.4 General relativity 14.5 Cosmological perturbations 14.6 Evolution of the perturbations Examples

15 ADVANCED TOPIC: DIFFUSION AND FREESTREAMING 15.1 Matter 15.2 Gas dynamics in flat space-time 15.3 Gas dynamics in the perturbed Universe 15.4 Multipoles and the Boltzmann hierarchy 15.5 Polarization 15.6 Initial conditions and the u'ansfer functions Examples

Appendix: Constants and parameters

Numerical solutions and hints for selected examples

References

Index

<<宇宙膨胀和大尺度结构>>

章节摘录

插图：

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