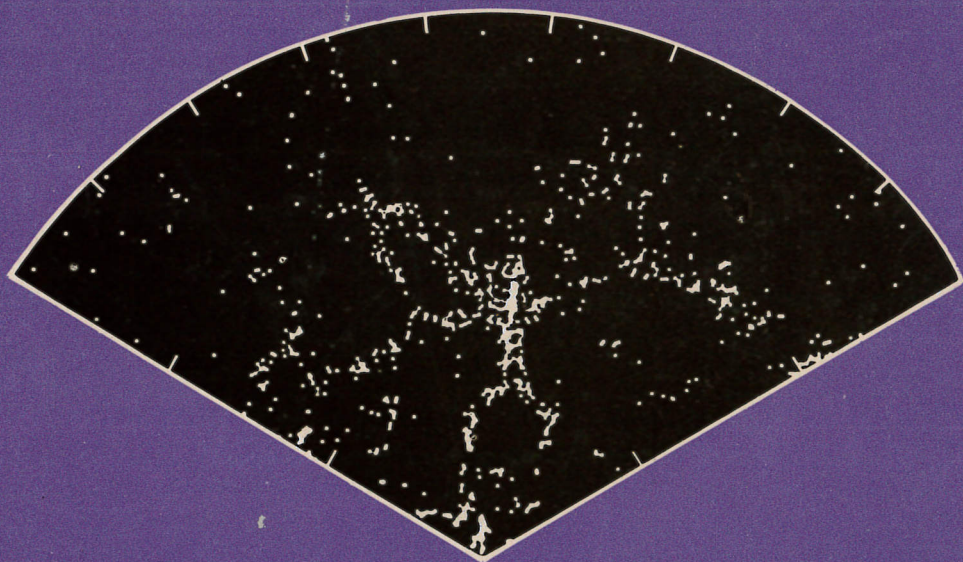


ADVANCES IN GRAVITATION AND COSMOLOGY



Edited by

B.R. IYER • A.R. PRASANNA
R.K. VARMA • C.V. VISHVESHWARA

CONTENTS

<i>Preface</i>	iii
<i>ICGC-91 Scientific Advisory Committee</i>	vii
<i>ICGC-91 Financial Sponsors</i>	vii
<i>List of Contributors</i>	viii

QUANTUM GRAVITY

1. Narada's Quest: Conceptual Problems and Present Approaches in Quantum Gravity – <i>Carlo Rovelli</i>	3
2. Recent Developments in Classical and Quantum Theories of Connections Including General Relativity – <i>Abhay Ashtekar</i>	20
3. Semiclassical Gravity – <i>T.P. Singh</i>	39
4. String Theory and Quantum Gravity – <i>Ashoke Sen</i>	59
5. What Do We Expect from Quantum Gravity? – <i>T. Padmanabhan</i>	69

CLASSICAL GRAVITATION

6. Asymptotic Structure: A Critical Appraisal – <i>B. Schmidt</i>	81
7. Parametric Manifolds and Canonical Gravity – <i>Zoltán Perjés</i>	92
8. Classical Aspects of Gravitation – <i>Zoltán Perjés</i>	101

GRAVITATIONAL RADIATION AND TESTS OF GRAVITATIONAL THEORIES

9. Gravitational Waves and Numerical Relativity – <i>Bernard F. Schutz</i>	109
---	-----

10. The Generation Problem in Gravitational Radiation Theory – <i>B.R. Iyer</i>	120
11. Gravitational Wave Data Analysis of Coalescing Binaries – <i>S.V. Dhurandhar</i>	134
12. Strong Field Tests of Relativistic Gravity – <i>Thibault Damour</i>	151
13. How ‘‘Right’’ is General Relativity? – <i>Clifford M. Will</i>	159
14. Workshop on Relativistic Astrophysics – <i>A.R. Prasanna</i>	174

COSMOLOGY

15. The Large Scale Structure of the Universe: Theory vs. Observations – <i>Varun Sahni</i>	183
16. Gauge Invariant Cosmological Perturbations – <i>R. Brandenberger, H. Feldman and V. Mukhanov</i>	205
17. Cosmic Strings and Large-scale Structure – <i>Alexander Vilenkin</i>	220
18. Non-violent Relaxation of Colliding Galaxies – <i>Henry E. Kandrup</i>	233
19. A Critical Approach to Cosmology – <i>Jayant V. Narlikar</i>	251
20. Workshop on Cosmology : A Report – <i>S. Mukherji and Varun Sahni</i>	272

ADVANCES IN GRAVITATION AND COSMOLOGY

B.R. Iyer, A.R. Prasanna, R.K. Varma and C.V. Vishveshwara

This book assesses research in Gravitation and Cosmology by examining the subject from various viewpoints. There are twenty articles by experts in their respective disciplines, each defines the state of art and contains a concise summary of our present understanding of a facet of gravitational physics. These edited papers are based on plenary talks and workshop summaries given at the Second International Conference on Gravitation and Cosmology held in Ahmedabad in December 1991. The academic programme of these series of conferences has been very carefully planned so that both technical advances and a broad critical perspective of each field is discussed in depth.

The conference focussed on three major areas namely Quantum Gravity, Gravitational Radiation and Cosmology in which research has made significant progress since ICGC-87. In some of these fields a critical appraisal was made of future prospects and unsolved issues. Advances in these areas have become so accelerated that they require constant dissemination and assessment.

For research workers and students of gravitation and cosmology this volume provides a broad and critical view of current problems and future prospects.

ISBN 81-224-0522-3

