

## CURRENT ISSUES IN COSMOLOGY

What are the current ideas describing the large scale structure of the Universe? How do they relate to the observed facts? This book looks at both the strengths and weaknesses of the current big-bang model in explaining certain puzzling data. It arises from an international conference that brought together many of the world's leading players in cosmology. In addition to presenting individual talks, the proceedings of the resulting discussions are also recorded. Giving a comprehensive coverage of the expanding field of cosmology, this text will be valuable for graduate students and researchers in cosmology and theoretical astrophysics.

JEAN-CLAUDE PECKER has had a long and successful career of research in the theory of stellar atmospheres, and later, cosmology. After studying at the École Normale Supérieure and gaining his doctorate from Institut d'Astrophysique de Paris in 1950, he held research positions at the CNRS, the University of Clermont-Ferrand, and the Paris Observatory in Meudon. He was Director of the Nice Observatory (1962–69), General Secretary of the IAU (1964–67), Director of the Institut d'Astrophysique de Paris (1972–79), and Professeur at the Collège de France from 1963 to his retirement in 1988. He has devoted much of his time to UNESCO activities, to the defence of human rights, to the promotion of a rationalist view of the world, and to the popularization of science. He has written nearly 30 books on astronomy and solar astrophysics, many of which have been translated and distributed throughout the world.

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## Preface

The idea of a Colloquium on “*Cosmology: Facts and Problems*” was mooted when one of us (JVN) was to visit Collège de France as Professor (Chaire Internationale) during 2003–04. Both of us felt that the subject of cosmology has seen considerable advancement on both observational and theoretical fronts but that there are many issues of observational nature that will remain to be understood. With this point of view the Colloquium was arranged during June 8–11, 2004, at Collège de France.

The Colloquium attracted leading workers in the field. They could be divided into three categories: 1. Observers 2. Theoreticians who liked to explain all the observed data in terms of the standard big-bang paradigm 3. Theoreticians who felt that there were some observations that did not allow a standard interpretation. Sometimes the observers also fell under categories 2 and 3. We were happy that the Colloquium attracted good participation from several countries and there was amiable and frank discussion on various issues. We had allowed plenty of time for discussion after each presentation including a panel discussion at the end. The proceedings presented here reflect this openness of the debate. Several participants who had not given a formal presentation also took part in the discussion.

We would like to express our grateful thanks to all those who helped us in various ways towards making this Colloquium such a success. In particular, we would like to thank Professor Jacques Glowinski, Administrateur du Collège de France, for his kindness in hosting the Colloquium at the Collège de France. We would also like to express our appreciation to Dr Ralph Krikorian, Maître de Conférences au Collège de France, Mme Simone Lantz, M. Jean-Claude Couillard, and Yvan Le Bozec from the Chaire de Physique Corpusculaire et Cosmologie du Collège de France for their help during the conference, and the Fondation Hugot and its Director, Mme Florence Terrasse-Riou, for financial support for the meeting. The

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*Preface*

administrative and technical staff of Collège de France also helped us in many different ways. In Pune, we thank Mr Vyankatesh Samak for his invaluable help in putting the manuscript together. Finally, we thank Dr Simon Mitton and Cambridge University Press their help in publishing these proceedings.

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