

Preface

Since the last International Astronomical Union Symposium that dealt with matters cosmological, there have been dramatic advances, both on the observational and theoretical fronts.

Modern high-efficiency detectors have made possible extensive magnitude-limited redshift surveys, which have permitted observational cosmologists to construct three-dimensional maps of large regions of space. What seems to emerge is a distribution of matter in extensive, flat, but probably filamentary, and possibly interconnected, superclusters, serving as interstices between vast voids in space. Meanwhile, theoretical ideas that were highly speculative a few years ago have begun to be taken seriously as possibly describing conditions in the very early universe. And brand new ideas, such as that of the inflationary universe, hold promise of solving outstanding observational, theoretical, and philosophical problems in cosmology. A new look at grand unified theories and concepts of supersymmetry have brought observational and theoretical cosmologists to a common meeting ground with modern particle physicists.

What better place to explore that figurative "meeting ground" than at a real one in the Aegean Islands, where our science of astronomy was born two millenia ago? A symposium on the early universe and its present structure held on the Island of Crete had the appeal of a classical Greek drama: unity of time (when these new ideas are coming to focus); unity of place (the seat of the beginning of modern cosmology); and unity of action (immediately following the 1982 General Assembly at Patras). I.A.U. Commissions 28 (Galaxies), 40 (Radio Astronomy), and 47 (Cosmology) were therefore delighted to accept the invitation of the Orthodox Academy of Crete to hold I.A.U. Symposium 104 at the Academy's splendid facilities at Kolymbari, on the northern shore of the west end of Crete, from 30 August through 2 September 1982.

The symposium was attended by 192 astronomers from 23 nations. There were 78 invited and contributed papers presented orally, and 43 as posters. We received manuscripts for 33 of the poster papers and for all but one of the oral papers (we deeply regret that one invited

speaker failed to submit a manuscript for his important contribution). The topics covered included a review of surveys of the universe at all wavelengths, the latest data on the spectrum and large- and small-scale isotropy (and anisotropy) of the cosmic background radiation, the observed parameters of superclusters and the large-scale structure of the distribution of matter in space, the possible nature of unseen matter (including neutrinos of non-zero rest mass), the kinematics and dynamics of matter in the universe, and theoretical considerations of the early universe, including the inflationary universe and phase transitions, predictions of grand unified and supersymmetry theories, and some comments on unconventional cosmologies.

As is usual with the Proceedings of I.A.U. symposia, the plan was to publish camera-ready manuscripts submitted by the authors. For the most part, this has been done. Many authors, however, do not have access to appropriate typewriters, and we have retyped their contributions. We also retyped other manuscripts that we felt could be improved in appearance or, especially, in English grammar and spelling (which, we acknowledge, present a formidable challenge to those for whom English is not a native language--and, alas, to many for whom it is!). Moreover, we have typed all the questions and answers from written versions received from questioners and authors after the actual exchanges (thereby giving them the opportunity to word their queries and responses in a form suitable for publication). We are happy to report that we have been able to collect 81 percent of the discussion in this written format.

We assumed responsibility for correcting typographical errors where we caught them in otherwise presentable manuscripts, but only if the original manuscript was in a type font we could match. Where we retyped authors' papers, and in typing the discussion, we are aware of the risk of introducing errors of our own (typographical and otherwise). There has been no opportunity to submit the retyped manuscripts to authors for approval, so where we have erred we can only apologize and take full blame. We have made a careful effort to avoid altering the meaning of any author, and hope that we have not done so.

No scientific meeting can be successful unless the local arrangements are comfortable and convivial. We believe from many comments received that Symposium 104 was highly successful, and can lay full credit for that achievement on the Local Organizing Committee, under the superb guidance of Professor George Contopoulos. First, the choice of the Orthodox Academy as a meeting place was ideal (despite the summer heat!), in a beautiful setting on the beach of the Sea of Crete. All sessions were in the morning (8:00 A.M. to noon) and evening (5:00 to 8:00 P.M.), leaving afternoon time for informal discussions, relaxation, and swimming--an opportunity fully exploited. Indeed, significant scientific discussions were held between delegates treading water in the sea! Many participants, while en route from Patras to Kolymbari, took advantage of a splendid tour of mainland Greece and the Island of Crete arranged by the Local Organizing Committee. Many more took lodging at the Academy itself, and still more took meals there; these arrangements were marvelous. There were tours to nearby points of interest for spouses, and a special tour and swimming outing for all at a nearby beach, where some of us enjoyed (in

retrospect!) a vigorous bout with jellyfish. None of us will forget the "Crete Night," which featured a sumptuous feast of Cretan specialties as well as folk songs and dancers.

We are extremely grateful to Bishop Irineos, Metropolitan of Kissamos and Selinos, and President of the Academy of Crete, for his hospitality and for inviting us to the Academy, and for coming in person to welcome us. We are also most grateful to the Academy and its Director, Mr. A. Papaderos for providing greatly reduced prices for room and board. In particular, Drs. S. Persides and S. Bonanos worked extremely hard before, during, and after the symposium to make it a success. We thank Olympic Airways for donating 15 free tickets from Athens to Crete, the Director of Museums for providing free admission to our tours, and the National Observatory of Athens for providing free lodging and transportation for several participants en route to the symposium. All other members of the Local Organizing Committee and volunteers, and especially Mr. M. Sfakianakis, were absolutely marvelous in their warmth, helpfulness, and in the generosity of their time. Also, we thank Mr. K. Dimopoulos, President of Balkania Travel Agency, for attaining really bargain prices in transportation and lodging, and for his special and personal concern that each of us received proper and efficient travel arrangements.

Finally, we thank the unsung secretaries who have worked so hard, for no extra compensation, both in planning the meeting and in helping with the preparation of these Proceedings. A partial list includes Mr. Forrest Barger and Mrs. Marietta Stevens, of the Department of Astronomy, UCLA, Miss Deborah MacArthur, of the Department of Physics and Astronomy, University of Oklahoma, and for the lion's share of the typing, cutting and pasting, correcting of spelling and other errors, and general help in editing, Mr. Robert L. O'Daniel, at UCLA.

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