

PREFACE

In the centennial year, 1985-86, of Harlow Shapley's birth, the study of globular clusters was no less important to the development of astronomy than in 1915, when Shapley first noted their concentration on the sky. By 1917 Shapley had used the properties of the system of globular clusters to complete the Copernican revolution and locate the solar system, and its Earth-bound observers, far from the center of the Galaxy and the globular cluster distribution. Seven decades later, in the year of these proceedings, globular cluster research and the study of the system of globular clusters in our own and distant galaxies is undergoing a renaissance of activity. The introduction of new observational tools, particularly CCD imagers and digital spectrographs, as well as powerful theoretical methods have transformed the study of globular clusters into one of the main line areas of modern astrophysics. Thus it seemed particularly appropriate to one of us, when considering how the Harvard College Observatory might mark the Shapley centennial, to propose and plan for an IAU Symposium on Globular Cluster Systems in Galaxies.

Planning for the Shapley Symposium, as it came to be called, was even more drawn out than the preparation of this volume. The Symposium was originally proposed to the IAU Secretariat in time for it to be held in August, 1985, so that it might occur in the centennial (calendar) year. The IAU turned this down, however, having banned all Symposia within a few months of the upcoming General Assembly meeting in New Delhi out of concern for finite travel budgets for the participants. Approval was promptly given for the Symposium to be held at the next available date proposed, August 1986, which still would allow the meeting to occur (so the Organizing Committee noted) within the 100th year of Shapley's birth in November 1885. Although Cambridge in August can be either stifling or cold and wet, the weather the week of the meeting (August 25-29, 1986) was as clear and crisp as the many excellent talks and discussions which took place in the meeting hall of the Harvard Science Center.

The intent of IAU Symposium 126 was to review the recent progress and future prospects in the studies of globular clusters in our own and external galaxies. Although there had been several recent meetings on globular clusters, including the 1984 IAU Symposium 113 on Dynamics of Star Clusters and the 1981 IAU Colloquium 68 on Astrophysical Parameters for Globular Clusters, no meeting had yet focused on the properties of the system of globular clusters as a whole. Given the remarkable progress in cluster observations with CCD detector systems on 4 m class telescopes, as well as the explosive growth of desk-top VAX class (e.g. microVAX) computers for both data analysis and theoretical modeling, the study of the nature and evolution of the cluster system in the Galaxy and beyond was now possible. Thus the Shapley Symposium was intended to highlight the large-scale properties of globular clusters and the formation and evolution of globular cluster systems in galaxies. Another motive in our original planning

was to have a Symposium on globular clusters to highlight the prospects and problems for the new studies of globular clusters that would be carried out by the Hubble Space Telescope, originally scheduled for launch only a few months after the meeting. The Challenger tragedy delayed this, of course, but has not diminished the prospects that some of the most exciting science with HST will result from its observations of globular clusters.

Perhaps the best tribute to the success of the meeting is contained in the opening words of Sidney van den Bergh's summary paper at the end of this volume: "This was a really exciting conference !" Indeed, the meeting followed closely on and provided a forum for the discovery of the apparent correlation between cluster metallicity and the slope of the luminosity (and thus mass) function of its stars. Comprehensive studies of the globular clusters in the Magellanic Clouds, as well as M 31 and Local Group galaxies, were presented which would have done Shapley (who was called "Mr. Magellanic Clouds" by Bart Bok, as Helen Sawyer Hogg reminded us in her delightful historical reminiscences) proud. The meeting was intended to pick up on several hot topics which were just (barely) introduced at the IAU Symposium 113 on stellar dynamics: the evolution of globular clusters past their core collapse stage and the possible re-expansion, and eventual tidal disruption, of clusters, as well as the disruption of globular clusters (not necessarily post-core collapse) by tidal shocks in the disk of the galaxy and by encounters with giant molecular clouds. These processes have been "confirmed" by numerous contributions at this meeting, although it remains for the next IAU Symposium to include the hard observational evidence that cluster re-expansion and cluster disruption are indeed observed. Finally, the quantity and quality of new results on distant globular cluster systems was reassuring for the original objectives of the conference. It is likely that a comparable surge in new results will only be available well after the first images with HST or, perhaps, in the era of either new dedicated 4 m class or very large ground-based telescopes.

This meeting achieved its goals thanks to the hard work of a large number of people. Perhaps foremost among the many who planned for and worked hard during the meeting was the chairman of the Local Organizing Committee, Robert Davis, who handled the CfA VAX's, mailings, registration and billing jobs with aplomb. Martha Hazen arranged the housing and feeding of conference participants as well as provided numerous invaluable suggestions for the overall organization of the meeting; David Latham carried out the Herculean task of editing the poster-paper abstracts submitted and arranged for them to be reproduced in a most useful book and for the poster papers themselves to be displayed on the poster boards; John Huchra organized the coffee and doughnut breaks, the registration procedures, and other matters; Jacqueline Kloss arranged for the bus transport to the evening reception at the Gardner Museum; and Owen Gingerich arranged for our use of the Science Center facilities as well as, with Barbara Welther, the delightful reception and music at the Isabella Stuart Gardner

Museum in Boston. The following generous donors helped to make the Gardner reception possible: Owen and Miriam Gingerich, Martha Hazen, Jacqueline and Henry Kloss, Edward Lilley, George Mumford, Alan Shapley, Lloyd Shapley, Willis Shapley, Charles Whitney, and John Wolbach. The presence of Willis Shapley at the meeting and the reception forged a welcome link between the participants and Harlow Shapley.

The actual operations of the meeting went off smoothly thanks to a number of people. Marilyn Bibeau and David Plancon of the HCO business office are thanked for their long hours keeping the books and arranging for bills to be paid. Corbin Covault and John Flanagan helped with numerous tasks in running the Symposium, and Christie Karlin did much of the secretarial work in putting together the Proceedings. Mary Bongiovanni took care of the job of passing out the discussion sheets, typing them up and then passing them back to speakers for proofing. She and Kristina Philip typed many of the final manuscript pages.

We note that at this meeting the submission of some of the papers was done in a new way, namely by electronic means. Approximately 1/8th of the papers were transferred to Schenectady or Cambridge either by BITNET or on a floppy disk. For these papers the editing process was made much more simple. Since all these papers could be printed on the same, laserjet, printer, the resulting book becomes more uniform in appearance. We expect that at future meetings the percentage of papers submitted in this manner will be much larger and at some point it will be possible to present the proceedings of a meeting with a completely uniform appearance. BITNET was also used for communications between the two editors and mitigated the effect of our being in two different cities.

Paul Hodge provided a most interesting, and entertaining, after-dinner talk at the conference banquet. Finally, Irwin Shapiro thoughtfully made available to the LOC resources of the CFA to help with the meeting and opened the conference with Derek Bok, who kindly took time out from his busy schedule to welcome the participants to Harvard in the year of its 350th anniversary.

The members of the Scientific Organizing Committee are listed below and are thanked for their assistance and patience in planning the Symposium:

P. Demarque (USA)	C. Pilachowski (USA)
M. Hoskin (UK)	A. Renzini (Italy)
K. Freeman (Australia)	V. Straižys (USSR)
J. Grindlay (USA), Chair	T. Van Albada (Netherlands)
G. Lyngå (Sweden)	S. Van den Bergh (Canada)
	R. Wielen (W. Germany)

The members of the Local Organizing Committee are thanked once

again for their many efforts:

R. Davis (Chair)	J. Huchra
O. Gingerich	J. Kloss
M. Hazen	D. Latham

The following conference participants chaired the scientific sessions, which are listed in the Table of Contents, and are thanked for leading the discussion in the sessions:

J. McClure	V. Trimble
J. Cohen	H. Zinnecker
J. Norris	M. Aurière
M. McCarthy	J. Goodman
C. Pilachowski	D. Hanes
G. Wallerstein	M. Rees
J. Watanabe	Y. Gnedin
V. Straižys	J. Grindlay
G. Lyngå	I. King

The Symposium was co-sponsored by the following IAU Commissions:

IAU Commission 33 - Structure and Dynamics of the Galactic System

IAU Commission 37 - Star Clusters and Associations

The Symposium was supported financially by the IAU and by the Harvard College Observatory and Smithsonian Astrophysical Observatories, to whom we are grateful.

September, 1987

Cambridge, Mass.
Schenectady, N.Y.

Jonathan E. Grindlay
A. G. Davis Philip

Editors

ASSORTED FIGURES FROM THE SYMPOSIUM

