

## Contents

<i>Participants</i>	x
<i>Group Photograph</i>	xii
<i>Preface</i>	xv
<i>Foreword</i>	xvii
<i>Acknowledgements</i>	xix

### The Observational Approach to Populations in Globular Clusters

*I. R. King*

Photometry in Globular Clusters . . . . .	1
Chemical Abundances in Globular Clusters . . . . .	7
The Morphology of Color-Magnitude Diagrams of Globulars . . . . .	10
Estimating the Distances of Globular Clusters . . . . .	16
Luminosity Functions and Mass Functions . . . . .	28
Low-Mass Stars . . . . .	33
Conclusion . . . . .	36
Appendix A . . . . .	36
References . . . . .	39

### Stellar Populations and the Formation of the Milky Way

*S. Majewski*

Introduction . . . . .	43
The Size and Shape of the Milky Way and Its Stellar Populations . . . . .	53
Survey of Age, Kinematical and Chemical Distributions in Stellar Populations . . . . .	69
Putting It All Together: Chemodynamical Pictures of Milky Way Formation . . . . .	97
References . . . . .	99

### Globular Clusters as a Test for Stellar Evolution

*V. Castellani*

The CM Diagram: an Introduction . . . . .	109
Stellar Evolution Investigations: The Ingredients . . . . .	110
What We Know and What We do not Know . . . . .	118
HST: Enlarging the Evolutionary Scenario . . . . .	135
The Pulsational Connection . . . . .	139
Leaving Our Galaxy ..... . . . .	145
Final Remarks . . . . .	147
Acknowledgments . . . . .	148
References . . . . .	148

Cambridge University Press

978-0-521-77058-3 - Globular Clusters: X Canary Islands Winter School of Astrophysics

Edited by C. Martinez Roger, I. Perez Fournon and F. Sanchez

Table of Contents

[More information](#)

viii

Contents

## Early Nucleosynthesis and Chemical Abundances of Stars in Globular Clusters

*R. Gratton*

Early Nucleosynthesis and Models of Galactic Chemical Evolution . . . . .	155
High Dispersion Analysis: Methods . . . . .	166
The Abundance Scale and Element-to Element Ratios in Globular Clusters . . . . .	175
Inhomogeneities in Globular Clusters . . . . .	184
Abundance Indices for Globular Clusters . . . . .	191
References . . . . .	199

## Stellar Dynamics in Globular Clusters

*R. A. W. Elson*

Overview: Why Study the Dynamics of Globular Clusters? . . . . .	209
Evolutionary Time Scales in Globular Clusters . . . . .	214
Surface Brightness Profiles of Globular Clusters . . . . .	221
Velocity Dispersions in Globular Clusters . . . . .	233
Formation and Evolution of Globular Clusters in the LMC . . . . .	239
Acknowledgments . . . . .	245
References . . . . .	246

## Pulsating Stars in Globular Clusters and Their Use

*M. W. Feast*

About Pulsating Stars . . . . .	251
Cepheids in Young Globular Clusters . . . . .	253
RR Lyrae Variables in Globular Clusters . . . . .	256
Mira and Semiregular (SR) Variables in Globular Clusters . . . . .	273
Acknowledgments . . . . .	287
References . . . . .	287

## X-Ray Sources in Globular Clusters

*R. Canal*

Low-Mass Binary X-Ray Sources and Millisecond Pulsars . . . . .	293
Neutron Star Formation: Core Collapse of Massive Stars . . . . .	295
Neutron Star Formation: Accretion-Induced Collapse of White Dwarfs . . . . .	298
Binary X-Ray Sources and Millisecond Pulsars: Evolutionary Scenarios . . . . .	304
Neutron Star Binaries in Globular Clusters . . . . .	312
Origin and Evolution of Neutron Star Binaries in Globular Clusters . . . . .	314
Summary . . . . .	318
References . . . . .	321

Cambridge University Press

978-0-521-77058-3 - Globular Clusters: X Canary Islands Winter School of Astrophysics

Edited by C. Martinez Roger, I. Perez Fournon and F. Sanchez

Table of Contents

[More information](#)

## Contents

ix

**Globular Clusters Systems: Formation  
Models and Case Studies***W. E. Harris*

Case Studies: The Milky Way GCS . . . . .	325
Interlude: Systemic Properties in Other Galaxies . . . . .	332
Case Studies: NGC 5128 . . . . .	338
Case Studies: NGC 4472 and M87 . . . . .	343
Case Studies: The Brightest Cluster Ellipticals . . . . .	347
A Brief Synthesis . . . . .	352
References . . . . .	353