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978-0-521-17491-6 - The Formation of the Milky Way

Edited by E. J. Alfaro and A. J. Delgado

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Is the current state of our Galaxy primarily the result of its initial conditions or is it the product of a lifetime of complex interactions with its environment? Gathered in this volume are papers presented at an international meeting in Granada (Spain) dedicated to exploring this fundamental question.

This timely review examines all the key physical processes involved in the formation and evolution of the Milky Way. A dozen invited review articles by international experts summarise our understanding to date; whilst more than 50 topical research papers present the latest results. Together, these papers provide a state-of-the-art view on topical issues such as disk instabilities, large-scale star formation, large-scale structure formation in our Galaxy, chemical evolution, disk-halo feedback, the galactic globular cluster system, stellar populations, and the formation of galaxies. Also included are three panel sessions identifying key routes for critical future research.

For graduate students and researchers, this volume provides a valuable and pertinent review of our new vision of the formation and evolution of our Galaxy.

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The Formation of the Milky Way

Proceedings of the IAA–IAC–University of Pisa Workshop,
held in Granada, Spain
September 4–9, 1994

Edited by
E. J. ALFARO AND A. J. DELGADO
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Preface

In recent years, our knowledge about the basic processes involved in the formation and evolution of our Galaxy has seen important advances, and, as often happens, new ideas on the status of the galactic system have given rise to a wealth of open questions, rather than settling old ones.

The goal of our workshop was twofold: to resume the reasonably well-established starting points, and to depict the framework in which the main lines of research should develop in the near future. A handful of basic questions were discussed, and conform to the general sequence of this book: the structure of the galactic disk and its relationship and evolutionary interplay with the other galactic components; the large-scale pattern of star-forming regions and its connection with the disk structure; the kinematical and metallicity structures of the various galactic components, with due attention paid to the old and intermediate age populations; the age and metallicity structures in the old thin disk, thick disk and halo; and theoretical and observational knowledge on the general topic of galaxy formation.

The contents of the book have not been arranged in separate chapters, a choice which reflects our primary idea of the topic “The Formation of the Milky Way” as an intricate puzzle, with significant connections between apparently unrelated pieces. The order of talks during the Workshop has been somewhat altered, but conceptually it follows the list of issues in the previous paragraph. The matters are presented in 14 review papers, and 57 contributed papers. Three panel sessions mark out the development of the book, reproducing the live discussions and exposition of ideas on general questions. There was a first panel session chaired by Guillermo Tenorio Tagle, which was regrettably not tape-recorded, making its inclusion in the proceedings unfeasible. However, many of the ideas and suggestions that arose there have wisely been taken into account by the other three panellists.

To finish this introduction, some special mentions deserve to be made. While working on a collaborative project some two years ago, Pepe Franco “suggested” to us that a meeting was necessary, where the basic questions on the formation of our Galaxy were approached from a multidisciplinary point of view, and he proposed Granada as an excellent venue for it to take place. His interest and persuasive powers led us to establish contacts with Guillermo Tenorio Tagle and Federico Ferrini, who joined us to make this project happen. They provided experience, friendship and the support of the Instituto de Astrofísica de Canarias and the University of Pisa, their respective host institutions. We are particularly indebted to them all.

Finally, as editors we wish to warmly thank every participant, most especially the members of the Scientific Organising Committee, whose interest and commitment contributed to making the IAA-IAC-UP workshop on the Formation of the Milky Way a most enjoyable and successful event.

Emilio Javier Alfaro, Antonio Jesús Delgado
*Granada,
 March, 1995*

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On behalf of the LOC, we wish to thank our host institution, Instituto de Astrofísica de Andalucía, who supported our work, not only prior to, and during, the Workshop, but further during the somewhat lengthy stage of editing the book. In particular, an acknowledgment must go to Carlos Barceló, Lucas Lara, David Martínez, and Javier Sánchez, for their assistance in the many technical details during the different sessions.

Ross Howard’s collaboration in the editing tasks deserves a comment here. He took care not only of the linguistic accuracy, but also of the innumerable stylistic details. Our thanks are given to him.

We also wish to express our acknowledgement to the International Science Foundation, whose financial help made possible the attendance of several scientists from the former Soviet Union.

Last, but not least, particular thanks are due to the only contributor whose manuscript arrived in perfect accordance with the time, size and CUP-format requirements. In contrast to the biblical episode, the act of a righteous person kept alive our confidence in the whole community.