

The book presents and discusses in depth a wide range of theoretical tools to decode the information gathered from photometric and spectroscopic observations of old stellar populations. These systems are the fossil record of galaxy formation and early evolution, and provide invaluable insights into the development of cosmic structures and the universe as a whole. The book starts with a detailed and up-to-date treatment of the evolution of low-mass stars, followed by a comprehensive discussion of a broad range of techniques to determine ages and initial chemical compositions – and more in general star formation histories – of resolved and unresolved old stellar systems. An extensive list of references is provided, together with examples of recent advances in our knowledge of the evolution of old stellar populations. A particularly representative case is the recent discovery of multiple stellar populations in Galactic globular clusters – one of the hottest topics in stellar and Galactic astrophysics – that is discussed in detail.

From the contents:

- Low-mass star physics
- From the Main Sequence to the tip of the Red Giant Branch
- Horizontal Branch and Red Clump
- Asymptotic Giant Branch
- White Dwarf cooling sequences
- Resolved old stellar populations in the Galaxy
- Resolved composite systems
- Unresolved old systems



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