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Autore	Salaris Maurizio
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Evolution; 4.1 Overall picture of stellar evolution; 4.2 Star formation; 4.3 Evolution along the Hayashi track; 4.3.1 Basic properties of homogeneous, fully convective stars; 4.3.2 Evolution until hydrogen burning ignition; 5 The Hydrogen Burning Phase; 5.1 Overview; 5.2 The nuclear reactions; 5.2.1 The p-p chain; 5.2.2 The CNO cycle; 5.2.3 The secondary elements: the case of $(2)H$ and $(3)He$; 5.3 The central H-burning phase in low main sequence (LMS) stars; 5.3.1 The Sun 5.4 The central H-burning phase in upper main sequence (UMS) stars 5.5 The dependence of MS tracks on chemical composition and convection efficiency; 5.6 Very low-mass stars; 5.7 The mass-luminosity relation; 5.8 The Schonberg-Chandrasekhar limit; 5.9 Post-MS evolution; 5.9.1 Intermediate-mass and massive stars; 5.9.2 Low-mass stars; 5.9.3 The helium flash; 5.10 Dependence of the main RGB features on physical and chemical parameters; 5.10.1 The location of the RGB in the H-R diagram; 5.10.2 The RGB bump luminosity; 5.10.3 The luminosity of the tip of the RGB 5.11 Evolutionary properties of very metal-poor stars 6 The Helium Burning Phase; 6.1 Introduction; 6.2 The nuclear reactions; 6.3 The zero age horizontal branch (ZAHB); 6.3.1 The dependence of the ZAHB on various physical parameters; 6.4 The core He-burning phase in low-mass stars; 6.4.1 Mixing processes; 6.5 The central He-burning phase in more massive stars; 6.5.1 The dependence of the blue loop on various physical parameters; 6.6 Pulsational properties of core He-burning stars; 6.6.1 The RR Lyrae variables; 6.6.2 The classical Cepheid variables; 7 The Advanced Evolutionary Phases 7.1 Introduction

Sommario/riassunto

Evolution of Stars and Stellar Populations is a comprehensive presentation of the theory of stellar evolution and its application to the study of stellar populations in galaxies. Taking a unique approach to the subject, this self-contained text introduces first the theory of stellar evolution in a clear and accessible manner, with particular emphasis placed on explaining the evolution with time of observable stellar properties, such as luminosities and surface chemical abundances. This is followed by a detailed presentation and discussion of a broad range of related techniques, that are widely
