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Nota di contenuto	Chapter 1.Mathematical Approaches to Nuclear Astrophysics -- Chapter 2.Mathematical Approaches to the Solar Neutrino Problem -- Chapter 3.A Gentle Introduction to the Evaluations of Thermonuclear Reaction-rate Probability Integrals -- Chapter 4.The Entropic Approach to Solar Neutrinos.
Sommario/riassunto	This open access book explores the fundamental workings of the Sun, unraveling the mysteries of solar structure, neutrino emissions, and the profound interplay between solar physics, nuclear reactions, and neutrino properties. Dive into the intricate world of nuclear and neutrino astrophysics with this book. Beginning with the renowned solar neutrino problem, the authors recount the historical journey that

commenced in 1968 with experiments aiming to detect solar neutrinos. These pioneering efforts unveiled a significant discordance between predicted solar neutrino fluxes and actual measurements—a puzzle that persisted until its resolution in 2002. The authors, immersed in this quest since 1974, undertook a multifaceted approach, refining theories in solar physics, nuclear physics, and neutrino science. Central to their investigation were analytic mathematical methods, particularly the application of special functions in mathematical physics. The narrative unfolds with a meticulous exploration of solar model construction, presenting simplified models that capture the Sun's complexity. Notably, the authors provide closed-form representations of nuclear reaction rates, a critical cornerstone in understanding stellar energy generation and neutrino production. Moreover, the book showcases advanced techniques for analyzing solar neutrino data, offering invaluable insights into the intricate dance of particles within the solar core. For researchers captivated by the enigmatic realm of astrophysical phenomena, this book serves as an indispensable guide. It encapsulates decades of rigorous research and intellectual pursuit, presenting a comprehensive synthesis of theoretical advancements and empirical findings in nuclear and neutrino astrophysics. Whether delving into solar dynamics, nuclear processes, or neutrino behavior, readers will find themselves enriched by the authors' profound contributions and analytical acumen.
