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Sommario/riassunto	The high accuracy of modern astronomical spatial-temporal reference systems has made them considerably complex. This book offers a comprehensive overview of such systems. It begins with a discussion of ‘The Problem of Time’, including recent developments in the art of clock making (e.g., optical clocks) and various time scales. The authors address the definitions and realization of spatial coordinates by reference to remote celestial objects such as quasars. After an extensive treatment of classical equinox-based coordinates, new paradigms for setting up a celestial reference system are introduced that no longer refer to the translational and rotational motion of the Earth. The role of relativity in the definition and realization of such systems is clarified. The topics presented in this book are complemented by exercises (with solutions). The authors offer a series of files, written in Maple, a standard computer algebra system, to help readers get a feel for the various models and orders of magnitude.

Beyond astrometry, the main fields of application of high-precision astronomical spatial-temporal reference systems and frames are navigation (GPS, interplanetary spacecraft navigation) and global geodynamics, which provide a high-precision Celestial Reference System and its link to any terrestrial spatial-temporal reference system. Mankind’s urgent environmental questions can only be answered in the context of appropriate reference systems in which both aspects, space and time, are realized with a sufficiently high level of accuracy. This book addresses all those interested in high-precision reference systems and the various techniques (GPS, Very Long Baseline Interferometry, Satellite Laser Ranging, Lunar Laser Ranging) necessary for their realization, including the production and dissemination of time signals. .