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Nota di contenuto	Why are Host Stars Important for Understanding Exoplanet Atmospheres -- Stellar Activity Phenomenology and General Principles -- Magnetic Fields the Source of Stellar Activity.-Stellar Chromospheres the Source of UV Emission -- Stellar Coronae the Source of Xray Emission -- Reconstructing the Missing Stellar Emission -- Panchromatic Spectra of Exoplanet Host Stars -- Stellar Winds -- Activity Indicator Correlations -- Host Star Driven Exoplanet Mass Loss and Possible Surface Water -- Host Star Driven Photochemistry in Exoplanet Atmospheres -- Space Weather the Effects of Host Star Flares on Exoplanets -- Heterogeneous Stellar Surfaces Spots and Faculae and their Time Variability -- Star Planet Interactions -- Effects of Stellar and Instrumental Noise on Radial Velocity Measurements -- Stellar

Contamination effects on Measurements of Exoplanet Radii and Densities -- Stellar Contamination effects on Measurements of Exoplanet Molecular Column Densities -- Summary and Final Comments.

Sommario/riassunto

This comprehensive introductory overview describes the emission of radiation (X-rays to radio) and the winds of host stars and how they control the past, present, and future evolution of an exoplanet. The book focuses on topics that are critically important for understanding exoplanet atmospheres but are often posed without a comprehensive and detailed understanding of the host star and its effects on the exoplanet. Although both stars and exoplanets are usually studied in isolation, in this book they are treated as an integrated system. Whether or not an exoplanet can retain its atmosphere and the chemical composition of the atmosphere depends critically on the strength, time dependence, and spectral energy distribution of the host star's radiation, flares, coronal mass ejections, and wind, which are described in detail in the book. The book describes the roles played by magnetic fields in the coronae and chromospheres of host stars that tie together stellar active phenomena with major effects on exoplanet atmospheres. In the era of JWST and very sensitive ground- and space-based instruments, a critical topic is the noise imposed on radial velocity measurements and transit photometry and spectroscopy by the host star's activity and variability that fundamentally limit our understanding of exoplanet properties. This topic is addressed in detail in the book. This book is written primarily for graduate students and researchers who are studying exoplanet atmospheres and habitability, but who may not have a background in the physics and phenomenology of host stars. The book could serve as a reference book for graduate level classes on exoplanets. Nonspecialists with a scientific background should also find this text a valuable resource for understanding the critical issues of contemporary exoplanet research. This new edition of "Host Stars and their Effects on Exoplanet Atmospheres" is a major revision of the existing book in the following ways: It includes a new discussion of how stellar noise fundamentally limits our understanding of exoplanet atmospheres. It demonstrates in detail how stellar activity acts as fundamental driver of exoplanet atmosphere evolution. It provides an outlook on how the field of exoplanet atmospheres and bio-astrophysics is being driven by powerful new telescopes and instruments. It extensively updates many chapters, in particular concerning host star extreme- and far-ultraviolet emission, stellar winds, stellar surface structures, the effects of space weather on exoplanets, and provides a realistic evaluation of habitability taking into account the evolution of host star activity.
