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Nota di contenuto	Contents; Giant Planet Magnetodiscs and Aurorae-An Introduction; Planetary Magnetodiscs: Some Unanswered Questions; Introduction; Magnetodisc Formation; Magnetodisc Motion; MHD Waves and Plasma Sheet Flapping?; What Force Dominates in Producing the Magnetodiscs of the Giant Planets?; The Source of Pressure Anisotropy; Dawn-Dusk Asymmetries of the Plasma Sheet; Out ow in the Tail; Summary; Acknowledgements; References; A Brief Review of Ultraviolet Auroral Emissions on Giant Planets; Introduction; General Characteristics of the Giant Gas Planets Aurorae First Detections of Aurora on Giant Gas PlanetsAtmospheric Origins of the Giant Planets UV Aurora; Other Wavelength Ranges; Jupiter; Current Understanding; Main Components of Jupiter's Aurora; Northern and Southern Polar Regions; The Main Emission (Oval); Overall Shape and Origin; Discontinuity; The Secondary Emissions; Overall Shape and Origin; Signatures of Injections; The Satellites Footprints; The Polar Emissions; Active Region; Dark Region; Swirl Region; Nightside and Polar Dawn Spots; Saturn; Current Understanding; Main Components of Saturn's Aurora; The Main (Ring of) Emission Emissions Poleward of the Main EmissionEmissions Equatorward of the

Main Emission; Spots; Outer Emission; The Enceladus Footprint; The Ice Giants; Uranus; Neptune; Conclusion; Jupiter and Saturn; Uranus and Neptune; The Juno mission; Acknowledgements; References; Solar Wind and Internally Driven Dynamics: In uences on Magnetodiscs and Auroral Responses; Introduction; Mass and Energy Flow in Planetary Magnetodiscs; Sources; Plasma Transport and Magnetosphere-Ionosphere Coupling; Suprathermal Particles in Planetary Magnetodiscs; Magnetopause Boundary Processes; Magnetic Reconnection Shear-Flow Driven InstabilitiesAuroral Signatures; Dynamics of Internally-Driven Aurora; The Satellite Footprints; Outer Emissions; Main Emissions/Main Oval; Dynamics of the Polar Aurora; Jupiter; Saturn; Solar Wind In uence; Jupiter; Saturn; Global Modeling of the Giant Planet Magnetospheres; Global Modeling Techniques and Limitations; Global Modeling Results; Global Con guration; Global Dynamics (Magnetospheric Responses to Solar Wind Driving); Plasma Loss from the Magnetosphere; Summary; Acknowledgements; References
Auroral Processes at the Giant Planets: Energy Deposition, Emission Mechanisms, Morphology and SpectraIntroduction: Key Magnetospheric Regions and Interactions; Jupiter; Saturn; Response of the Ionosphere to Auroral Forcing at the Giant Planets; Energy Deposition of Precipitating Auroral Particles; Energetic Electrons; Models of Suprathermal Electron Transport; Electron Production Rate; Energetic Ions; Models of Suprathermal Ion Transport; Comparison Between Electron and Ion Energy Deposition; Ionospheric Response to Auroral Forcing; Electron Densities; Observations of Electron Density Ionospheric Models

Sommario/riassunto

Readers will find grouped together here the most recent observations, current theoretical models and present understanding of the coupled atmosphere, magnetosphere and solar wind system. The book begins with a general discussion of mass, energy and momentum transport in magnetodiscs. The physics of partially ionized plasmas of the giant planet magnetodiscs is of general interest throughout the field of space physics, heliophysics and astrophysical plasmas; therefore, understanding the basic physical processes associated with magnetodiscs has universal applications. The second chapter characterizes the solar wind interaction and auroral responses to solar wind driven dynamics. The third chapter describes the role of magnetic reconnection and the effects on plasma transport. Finally, the last chapter characterizes the spectral and spatial properties of auroral emissions, distinguishing between solar wind drivers and internal driving mechanisms. The in-depth reviews provide an excellent reference for future research in this discipline.