Space Physics and Aeronomy Collection

5-Volume Set

Edited by: Yongliang Zhang & Larry J. Paxton

Earth Science/ Geology & Geophysics

Space Physics and Aeronomy is a unique, comprehensive depository of the scientific and technological aspects of the space physics and aeronomy fields. It covers space science of the entire solar system, from the Sun, solar wind, to the magnetospheres, ionospheres and neutral atmospheres of planets, as well as applications of the scientific advances to operations in space and ground. Almost all of changes in space environment are caused by activities within the Sun. The five volumes will reveal new progresses in understanding our space environment due to new observations, modelling capabilities and theories. Readers will get a comprehensive view on how the Sun impacts the space environment, our life on the Earth and future space travel.

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- **Volume 2** will cover formation of the magnetospheres around planets, solar wind interactions with the magnetospheres, large scale structure and dynamics, magnetic field reconnection, wave-particle interaction, cross-scale energy transport, magnetosphere-ionosphere coupling, mini-magnetospheres and Moon-magnetosphere interaction, and challenges for future research.
- **Volume 3** addresses electrodynamics of the ionosphere in different regions from polar cap/auroral oval to mid and low/equatorial latitudes. It will cover drivers of ionospheric variations, such as penetration electric field, ionospheric storms, stratospheric warming, thermosphere-ionosphere coupling, lower atmospheric waves and tide's effect on ionosphere, ionospheric impact on radio communication, GPS navigation, geomagnetically induced currents, and ionospheric response to earthquakes.



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- **Volume 4** will cover the forefront in thermospheric research, such as the thermosphere dynamics and energetics due to competition in heating and cooling processes, neutral composition changes under different geomagnetic conditions, coupling to the lower atmosphere through gravity waves and tides, effect on ionosphere by ion-neutral coupling, variations over different spatial and time scales, impact on magnetosphere through energy dissipation, neutral upwelling and ion outflow.
- **Volume 5** focuses on space weather nowcast and forecast as well as the space weather impact on operations. Ionizing radiation in the magnetosphere and solar wind affects astronauts and operations of spacecraft and its instruments.

Space Physics and Aeronomy is a valuable comprehensive resource for scientists, researchers, students and instructors in the field of space physics, heliophysics, atmospheric science, earth science and environmental science.





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