



# Magnetohydrodynamics of the Sun

By Eric Priest

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## **Magnetohydrodynamics of the Sun** By Eric Priest

Magnetohydrodynamics of the Sun is a completely new up-to-date rewrite from scratch of the 1982 book Solar Magnetohydrodynamics, taking account of enormous advances in understanding since that date. It describes the subtle and complex interaction between the Sun's plasma atmosphere and its magnetic field, which is responsible for many fascinating dynamic phenomena. Chapters cover the generation of the Sun's magnetic field by dynamo action, magnetoconvection and the nature of photospheric flux tubes such as sunspots, the heating of the outer atmosphere by waves or reconnection, the structure of prominences, the nature of eruptive instability and magnetic reconnection in solar flares and coronal mass ejections, and the acceleration of the solar wind by reconnection or wave-turbulence. Developed for a graduate course at St. Andrews University, this advanced textbook provides a detailed account of our progress toward answering many key unsolved puzzles in solar physics. It is essential reading for graduate students and researchers in solar physics and related fields of astronomy, plasma physics, and fluid dynamics. Problem sets and other resources are available at [www.cambridge.org/9780521854719](http://www.cambridge.org/9780521854719).

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### Editorial Review

#### About the Author

Eric Priest completed his PhD thesis with T. G. Cowling at Leeds in 1969, having moved to a tenured position at St Andrews University in 1968. He gradually built up an internationally renowned Solar MHD group there and is now a highly active Emeritus Professor. He has edited fifteen books and written over 450 research papers. His book *Solar Magnetohydrodynamics* (1982) became a standard text in the field and has been completely rewritten from scratch to be reborn as *Magnetohydrodynamics of the Sun*. Honours include being elected a Fellow of the Royal Society (2002) and being awarded the Hale Prize of the American Astronomical Society (2002) and the Gold Medal of the Royal Astronomical Society (2009).

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