



An Introduction to Magnetohydrodynamics, P.A. Davidson, Cambridge University Press, 2000, pp: 425, ISBN 0521794870 (pbk); Price: US\$40

Here we have an introductory text on interacting conducting fluids and magnetic fields pitched at the level of an advanced undergraduate natural-sciences student. The general bias of the book is towards terrestrial applications, a fascinating aspect of which are the recent advances in metallurgical applications of magnetohydrodynamics (MHD), which yield fruit in everything from tokomaks¹ to applied mathematics. While keeping its feet on the ground, the book does also go into some detail about the origin and interactions of the terrestrial magnetic field which inevitably involves solar-system considerations. It does a very good job of tying all of these diverse physical processes together while illustrating, along the way, the basic necessary concepts of plasma physics.

The book is divided into two parts: The first starts off with the requisite review of electromagnetics and fluid mechanics, followed by a careful exposition of the kinematics of MHD. Dynamics are then discussed at low and high Reynolds numbers which naturally leads to a clear and physically motivated discussion of turbulence. The second part of the book describes various applications in engineering metallurgy.

In a field where most books are either formalism-heavy or -light, *An Introduction to Magnetohydrodynamics* seems to have found the proper balance between physics and formalism, so I strongly recommend it.

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1. Also spelled *tokamaks*. -Ed.(BR)