

vide the kind of training that is described in *The Art of Being a Scientist*. Professors who want to develop a course similar to Snieder and Lerner's will find the book to be a useful template and text. It may not provide all the necessary detail, but it does describe most of the key elements. The appendices include a list of resources and a sample curriculum; combined, they provide a good coursework foundation.

One book cited in the appendices is *A Ph.D. Is Not Enough: A Guide to Survival in Science* (Basic Books, 1993), by physicist Peter J. Feibelman. The contents of that book overlap significantly with Snieder and Lerner's text. Feibelman's text is written in a more charming and personal style, but *The Art of Being a Scientist* provides a more modern treatment of soft skills and an updated discussion of the differences between industrial and academic workplaces. Incidentally, neither book mentions the importance of international experience, which is an aspect of graduate education that will play an ever-larger role in the training of PhDs for the global workplace.

The Art of Being a Scientist is a welcome map for the voyage that is scientific graduate education. Graduate students will find it particularly useful and will likely consult it often throughout their academic experience and beyond; it will be valuable, as well, to undergraduate students as they consider graduate school. The book may also help parents gain a better understanding of what kind of life their child is choosing and what obstacles he or she will face. And it should be an excellent resource for graduate-school mentors, particularly those who endeavor to offer more comprehensive training to their students.

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The Magnetic Universe

The Elusive Traces of an Invisible Force

J. B. Zirker

Johns Hopkins U. Press, Baltimore, MD, 2009. \$70.00, \$35.00 paper (542 pp.). ISBN 978-0-8018-9301-8, ISBN 978-0-8018-9302-5 paper

Plasma astrophysics, which includes space-plasma physics and solar physics, has flourished since the middle of the 20th century, roughly coinciding

with the beginning of the space age. Instruments on spacecraft allow us to directly measure the properties of plasmas within our own solar system and to observe astrophysical plasmas remotely in parts of the electromagnetic spectrum that are not accessible from the ground. The wealth of data gathered by ground- and space-based instruments has led to a vast number of discoveries of beautiful, but also very complex phenomena.

In his book *The Magnetic Universe: The Elusive Traces of an Invisible Force*, Jack Zirker takes the reader on a journey through the cosmos, starting with a look at terrestrial magnetism and ending with magnetic fields that are generated at cosmological scales. Zirker, an emeritus astronomer at the National Solar Observatory, devotes approximately the first half of the book to descriptions of planetary and solar phenomena in our own solar system. In the rest of the book, he discusses the importance of magnetic fields to star formation and for compact objects, galaxies, and galaxy clusters. Zirker summarizes the history of the topics presented in each chapter and includes brief descriptions of more recent research developments and of some of the researchers involved in them.

Written in a clear, readable style, the book should be accessible to anyone with a high-school or college background in physics or astronomy. In the main text, no mathematical equations are used, and even in the notes at the end of the book, few are found. The chapters' capsule histories and brief summaries of recent research add to the book's liveliness. Although the material is complex, the author does an admirable job conveying to the reader the excitement and enthusiasm of the researchers for their work, even as they struggle to understand it.

Although I generally like the book, in some cases, additional figures would help readers better understand the text. Moreover, I am puzzled by the book's utter lack of color images. There are so many stunning ones that illustrate the beauty of the objects we study in plasma astrophysics, it's a pity that some were not used. For example, in chapter 7, "The Planets," Zirker describes, but does not show, images of Jupiter's and Saturn's magnetospheres taken by the Magnetospheric Imaging Instrument aboard the *Cassini* spacecraft. Whatever



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the reasons were for using only grayscale images, the lack of color, in my opinion, represents a wasted opportunity to make the book more appealing.

Another point of criticism is that the book contains a fair number of typographical and factual errors, such as in the names of researchers and in identifying their institutions or nationalities. One name is repeatedly given incorrectly: University of Glasgow astrophysicist Peter Sweet, of the famous Sweet-Parker reconnection model, is consistently called Paul Sweet. In another example, the three-dimensional model of magnetic reconnection that is attributed to Eric Priest and Terry Forbes in a figure and in the text is actually not their model; although the figure is on the cover of their book *Magnetic Reconnection: MHD Theory and Applications* (Cambridge University Press, 2000), it is taken from a simulation by Klaus Galsgaard and Åke Nordlund of the University of Copenhagen.

Also, Zirker discusses some recent research developments in a way that is debatable. For example, in chapter 5, Zirker discusses only resonant absorption as a means of how the energy of Alfvén waves could be dissipated and contribute to heating the solar corona; other possible mechanisms, such as

phase mixing, are not mentioned at all. However, I can understand that Zirker had to make choices regarding what to include and what to leave out, given that the book is intended for the general public and is not a scientific review or textbook.

Despite those complaints, I thoroughly enjoyed reading the book and would recommend it to anyone interested in learning about the importance of magnetic fields in the universe.

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Asteroseismology. C. Aerts, J. Christensen-Dalsgaard, D. W. Kurtz. *Astronomy and Astrophysics Library*. Springer, New York, 2010. \$129.00 (866 pp.). ISBN 978-1-4020-5178-4

Astrophysics of Planet Formation. P. J. Armitage. Cambridge U. Press, New York, 2010. \$65.00 (284 pp.). ISBN 978-0-521-88745-8

The Cluster Active Archive: Studying the Earth's Space Plasma Environment. H. Laakso, M. G. T. Taylor, C. P. Escoubet, eds. *Astrophysics and Space Science Proceedings*. Springer, New York, 2010. \$249.00 (489 pp.). ISBN 978-90-481-3498-4

Gravity's Fatal Attraction: Black Holes in the Universe. 2nd ed. M. Begelman, M. Rees. Cambridge U. Press, New York, 2010 [1995]. \$99.00, \$36.99 *paper* (302 pp.). ISBN 978-0-521-88944-5, ISBN 978-0-521-71793-9 *paper*

High Energy Cosmic Rays. 2nd ed. T. Stanev. *Springer-Praxis Books in Astronomy and Planetary Sciences*. Praxis/Springer, New York, 2010 [2004]. \$159.00 (333 pp.). ISBN 978-3-540-85147-9

High Energy Radiation from Black Holes: Gamma Rays, Cosmic Rays, and Neutrinos. C. D. Dermer, G. Menon. *Princeton Series in Astrophysics*. Princeton U. Press, Princeton, NJ, 2009. \$120.00, \$75.00 *paper* (538 pp.). ISBN 978-0-691-13795-7, ISBN 978-0-691-14408-5 *paper*

The Impact of HST on European Astronomy. F. D. Macchetto, ed. *Astrophysics and Space Science Proceedings*. Proc. symp., Noordwijk, the Netherlands, May–June 2007. Springer, New York, 2010. \$249.00 (312 pp.). ISBN 978-90-481-3399-4

The Jet Paradigm: From Microquasars to Quasars. T. Belloni, ed. *Lecture Notes in Physics* 794. Springer, Berlin, 2010. \$79.95 (291 pp.). ISBN 978-3-540-76936-1

Jets from Young Stars V: High Performance Computing and Applications. J. Gracia, F. De Colle, T. Downes, eds. *Lec-*

ture Notes in Physics 791. Springer, Berlin, 2009. \$79.95 (227 pp.). ISBN 978-3-642-03369-8

MHD Flows in Compact Astrophysical Objects: Accretion, Winds and Jets. V. S. Beskin (translated from Russian by N. A. Ivanova). *Astronomy and Astrophysics Library*. Springer, Berlin, 2010. \$129.00 (426 pp.). ISBN 978-3-642-01289-1

Mysteries of Galaxy Formation. F. Combes (translated from French by B. Mizon). *Springer-Praxis Books in Popular Astronomy*. Praxis/Springer, New York, 2010. \$29.95 *paper* (191 pp.). ISBN 978-1-4419-0867-4

On the Pulsar. B. B. Kadomsev (translated from Russian by M. S. Aksenteva). World Scientific, Hackensack, NJ, 2010. \$28.00 (135 pp.). ISBN 978-981-4289-72-6

Proceedings of the Third UN/ESA/NASA Workshop on the International Heliophysical Year 2007 and Basic Space Science: National Astronomical Observatory of Japan. Vol. 2. H. J. Haubold, A. M. Mathai, eds. *Astrophysics and Space Science Proceedings*. Proc. wksp., Tokyo, June 2007. Springer, Berlin, 2010. \$189.00 (190 pp.). ISBN 978-3-642-03323-0

Submillimeter Astrophysics and Technology: A Symposium Honoring Thomas G. Phillips. D. C. Lis et al., eds. *Astronomical Society of the Pacific Conference Series* 417. Proc. symp., Pasadena, CA, Feb. 2009. Astronomical Society of the Pacific, San Francisco, 2009. \$77.00 (458 pp.). ISBN 978-1-58381-714-8

biological and medical physics

The Handbook of Medical Image Perception and Techniques. E. Samei, E. Krupinski, eds. Cambridge U. Press, New York, 2010. \$160.00 (424 pp.). ISBN 978-0-521-51392-0

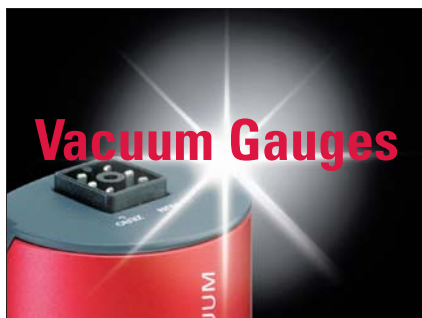
Molecular and Cellular Enzymology. Vols. 1 and 2. J. Yon-Kahn, G. Hervé (translated from French by P. Simister, K. Wood, L. Walter). *Grenoble Sciences*. Springer, Berlin, 2010. \$299.00 *set* (783 pp. *set*). ISBN 978-3-642-01227-3 *set*

chemical physics

Colloid Science. Vol. 2: A Review of the Literature Published 1972–1974. D. H. Everett. *Specialist Periodical Reports*. The Chemical Society (Royal Society of Chemistry), Cambridge, UK, 2010 [1975, reissued]. \$559.00 (323 pp.). ISBN 978-0-85186-518-8

The Jahn-Teller Effect: Fundamentals and Implications for Physics and Chemistry. H. Köppel, D. R. Yarkony, H. Barentzen, eds. *Springer Series in Chemical Physics* 97. Springer, Berlin, 2009. \$199.00 (915 pp.). ISBN 978-3-642-03431-2

The Mesoscopic Theory of Polymer Dynamics. 2nd ed. V. N. Pokrovskii. *Springer Series in Chemical Physics* 95.



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