

# BOOKS

## An Eventful 100 Years in Astronomy

### A History of Astronomy: From 1890 to the Present

David Leverington  
*Springer-Verlag, New York, 1995.*  
387 pp. \$32.00 pb  
ISBN 3-540-19915-2

Reviewed by Kevin Krisciunas

"The twentieth century, for so long synonymous with progress and modern thinking, has but a short way to go before it becomes the last century." This obvious point, but an insight nevertheless, begins David Leverington's summary of the past hundred years of progress in astronomy, an exciting hundred years to be sure.

Why begin the narrative ten years prior to the turn of the last century? The early 1890s mark the start of much important work: the plan for an international collaboration to map the whole sky photographically (the *Carte du Ciel*), the establishment of the first permanent mountaintop observatories, systematic photographic searches for asteroids, the start of the Harvard spectroscopic surveys and the establishment of the *Astrophysical Journal*. By the first decade of this century, physicists had discovered x rays and the electron and laid the groundwork for quantum mechanics and relativity. Larger reflecting telescopes began to supplant long-focus refractors as the instruments of choice, and astrophysics began to supplant positional astronomy as the activity of choice amongst astronomers.

Leverington, who has worked as a high-level manager for the European Space Agency and for British Aerospace Communications, does a commendable job in *A History of Astronomy* of summarizing much of the instrumental developments and many of the specific discoveries of the past century.

A famous astronomer once told me, "All science becomes anonymous. No-

body calls it the Rutherford model of the atom any more." Leverington adopts the perspective, rightly advocated by the protagonists of the big bang theory, Ralph Alpher and Robert Herman, that proper credit does matter. So in this book we find various discoveries associated with the famous and the not so famous. For example, it was Charles Boyer, a French amateur astronomer living in the Congo, who discovered in 1957, through ultraviolet photography, that the clouds of Venus rotate around the planet with a period of four days. (This was finally confirmed by the US probe, Mariner 10, in 1974.) The first to see the active volcanoes on Jupiter's moon Io was Linda Morabito of the Jet Propulsion Laboratory, who was studying Voyager 1 images. Ian Shelton, Oscar Duhalde and Albert Jones independently discovered supernova 1987A.

I would certainly recommend this book to any reader with an interest in astronomical history and modern research. The coverage is sufficiently up to date to touch on the repair mission to the Hubble space telescope and the identification of the gamma-ray source Geminga as a pulsar with a period of 237 ms. It taught me that my knowledge of what is known about the Solar System was in need of some serious updating. For such updating, the book suffices. However, it does not contain exhaustive references to source material.

My biggest criticism is directed at the publisher, and at publishers in general. Imagine an author's dismay, after having corrected the proofs, to find that the publisher removed the section numbers to which reference was made throughout the book. An erratum slip is enclosed, but this makes only partial amends. And surely there could have been a bit more proofreading, to keep the two dozen typesetting errors (by my count) out of the finished product. This seems to be the going rate for astronomy books, and I fear that things are getting worse.

An editor from a different publishing house wrote to me recently and asked which were the "most important five or six corrections" to be made among the two dozen mistakes in the equations in my article for their encyclopedia! It is important for everyone

to pay attention to the details. Otherwise we open ourselves up to the criticisms by creationists and the like that we do not know what we are doing.

### Interplanetary Magnetohydrodynamics

Leonard F. Burlaga  
*Oxford U. P., New York, 1995.*  
256 pp. \$70.00 hc  
ISBN 0-19-508472-1

Several decades of interplanetary exploration, and especially such tremendously successful missions as Pioneer, Helios, Voyager and Ulysses, have made enormous contributions to the understanding of space plasma physics. Although not a traditional field of physics, this discipline has proved to be of fundamental importance in magnetospheric, solar, stellar and cosmic applications, and its underlying basic physical processes are certain to be key elements in unraveling problems ranging from space weather to cosmology. Unlike its cousin, laboratory plasma physics, space physics has always been dominated by *in situ* observations, and all too frequently the taxonomy of "events" has stood in place of real physical theory.

In *Interplanetary Magnetohydrodynamics*, Leonard Burlaga focuses on a well-explored subset of space plasmas, the interplanetary medium or solar wind. Throughout the book, he describes phenomena in terms of a magnetofluid approximation, which enables him to develop a number of concepts and physical principles skillfully, and at a reasonable level of detail, while maintaining close contact with crucial space-data sets. It is laudable that Burlaga did not attempt to cover the field completely; this is not an extended review article. Instead, the book follows closely the conceptual path Burlaga has taken in his three-decade involvement with space exploration, space-physics theory and, especially, the Voyager magnetic-field and plasma instrumentation. In *Interplanetary Magnetohydrodynamics*, Burlaga blends his detailed understanding of the observations with both standard plasma theory and modern concepts from nonlinear dynamics, turbulence

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