and quantum mechanics. Once that is achieved, Piazza's choice of material and his lucid presentation of abstract, sometimes difficult concepts will make for instructive and enjoyable reading.

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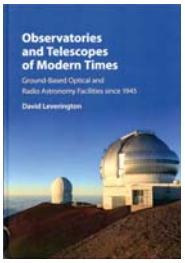
Observatories and Telescopes of Modern Times

Ground-Based Optical and Radio Astronomy Facilities Since 1945



David Leverington

Cambridge U. Press, 2017. $175.00 (502 pp.). ISBN 978-0-521-89993-2

In his book *Observatories and Telescopes of Modern Times: Ground-Based Optical and Radio Astronomy Facilities Since 1945*, David Leverington tells a concise history about those many astronomical structures. That is a lot of observatories and telescopes, and he admits that it may "read a little more like an encyclopedia." An encyclopedic tour it is. Though a tad skewed toward US–Anglo examples, *Observatories and Telescopes of Modern Times* examines most of the significant telescopes around the world.

The book is divided into two parts that cover optical- and radio-wavelength telescopes. In the first part, Leverington starts with the Palomar Observatory in Southern California and then moves to other observatories located in the US, Chile, South Africa, and Australia. After giving a brief history of an observatory site, Leverington offers technical specifics of its telescopes, such as mirror size and focal point. Three interpolated chapters are devoted to mirror designs, optics, and interferometry. The author's decision to organize his book around telescopes rather than scientific achievements allows each chapter to be read independently. An attempt to interweave scientific discoveries and developments with the telescopes would have likely resulted in an overly complex structure.

The chapters on optical observatories follow a roughly chronological order. As the section progresses, the operation of the observatories Leverington describes becomes increasingly complex. By the end of part 1, the observatories can no longer be called single-institution or even single-nation enterprises. Whereas Caltech and the Carnegie Institution for Science operated the Mount Wilson and Palomar Observatories under a fairly complex partnership at the end of World War II, today's observatories and telescopes operate on a percentage share among institutions and countries.

In the radio astronomy section, observatories in Australia, the UK, and the US receive the most attention, although the author covers ones in Europe, Canada, Central America, South America, Asia, and the South Pole. The smaller number of radio observatories permits Leverington to devote more time to each site's background and characteristics. In the chapter on radio observatories in Australia, for example, Leverington traces the developments at different locations and puts together a cohesive narrative about the history of Australian radio astronomy. For the Mullard Radio Astronomy Observatory at the University of Cambridge, he delves into the role of individual astronomers and how their personalities shaped the group.

Leverington intends the book for both technical and nontechnical readers. For the latter audience, a basic knowledge of physics and observational astronomy will come in handy, as some basic terminology is used without explanation. For instance, newcomers to astronomical observation may not understand the meaning of *f*/5 or the significance of terms such as Cassegrain and coudé focus. Overall, though, Leverington strikes a good balance by imparting sufficient information without going into too much detail.

Perhaps the biggest shortcoming of *Observatories and Telescopes of Modern Times* is the author's tendency to focus on the *what* of the events that happened with little attention to the *why*. Technological developments for observational astronomy after 1945 were strongly influenced by the Cold War, for example. However, most of the book treats telescopes and technologies separately from the rest of human affairs, and the result can be dry reading. I think the book would have benefited from placing the construction of the telescopes and observatories in their larger political and social contexts more often. The South African government's involvement with the Southern African Large Telescope after the ending of apartheid is one of the few places where Leverington dwells on the significance of politics. And he does give fair coverage to the environmental issues surrounding the Mount Graham International and Mauna Kea Observatories.

I also wish that Leverington, who has held senior management positions at the European Space Agency and British Aerospace, had included more about his own experiences. In a few places, such as the sections on the Very Large Telescope and the Sloan Digital Sky Survey, he does offer footnotes with opinions on management. Expanding on those opinions to further examine large projects that require extensive management would have made the book unique and more interesting.

Despite those criticisms, *Observatories and Telescopes of Modern Times* offers technically informed readers an excellent reference. Readers will come away from the book with a better understanding of existing telescopes and observatories along with some of their scientific specifications and achievements.

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