
Book Review

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GALILEO'S TELESCOPE: A EUROPEAN STORY

By Massimo Bucciattini, Michelle Camerota and Franco Giudice
Cambridge, MA: Harvard University Press; 2015. 340 pages.

In September, 1608, Hans Lipperhey, a German-born spectacle maker, working in the Netherlands, attempted to patent a telescope. Within a few weeks, another spectacle maker requested a patent, and at least a third person claimed the invention. Although Lipperhey was the first to apply for a patent, his application was rejected because others had knowledge of the invention. Lipperhey's innovation did not involve putting two lenses together to see faraway, because that had been recognized for at least a couple decades, but rather perhaps in the use of apertures to compensate for the poor quality of the lenses then available. Knowledge of the spyglass spread across Europe within months.

By November, 1608, Galileo's friend and scientific colleague Paolo Sarpi had heard about the spyglass. By the summer of 1609, Galileo was working with unknown spectacle makers to try to improve the quality of the telescope. He completed his first telescope in late July, 1609, and later he set up an optical workshop in his house to continue his efforts to make better lenses for telescopes. Before Kepler published his geometrical optics book *Dioptrice* (1611), Galileo had combined elementary optical knowledge from books such as Giovan Battista Della Porta's *Magia Naturalis* (1589) with empirical methods learned from spectacle makers to improve the performance of the spyglass to the point that it became a useful astronomical instrument. By late November, 1609, Galileo was using it to make systematic observations of the Moon.

In March, 1610, Galileo's book *Sidereus nuncius* (*Starry Messenger*) was published. It contained a description of the rough surface of the Moon, the discovery of four satellites orbiting Jupiter, the finding that the Milky Way was made up of numerous individual stars, and other observations. Remarkable for its time was the fact that it included illustrations of what Galileo had seen with his telescope.

The authors spend significant time discussing the controversies surrounding Galileo's book arising in part because Galileo did not describe how the telescope worked and he did not mention some of the previous work by others, but mostly because there was difficulty in confirming Galileo's observations. This latter difficulty may have been due to the fact that Galileo appeared to have reserved his best telescopes for himself and various Roman prelates rather than providing them to other scientists who were not able to make telescopes of the quality that he did. Galileo also experienced resistance because his findings seemed to contradict the beliefs of some rigid theologians, astrologers, and

Aristotelian philosophers. Support came from Kepler, some astronomers, and others who were able to confirm what he had described.

This book covers a period of time from the first significant telescope in 1608 to the spread across the globe of knowledge of Galileo's book *Sidereus nuncius* in the 1610s. In an epilogue, the authors noted that just a few years later, in 1616, Copernicus's book was banned by the Roman Congregation of the Index of Forbidden Books, "establishing an initial dividing line between the true and false constitution of the universe, between conclusions that could licitly be drawn thanks to telescopic observations and those that were banned..." (p. 237) The authors are history of science professors at universities in Italy. The book is well illustrated and presents an interesting perspective on the telescope and its early application as an astronomical instrument.

Galileo's Telescope: A European Story. D Massimo Bucciantini, Michele Camerota, and Franco Giudice. Translated by Catherine Bolton. Cambridge, MA: Harvard University Press, 2015. ISBN 978-0-674-73691-7. 340 pages. Hardcover, \$35.00.