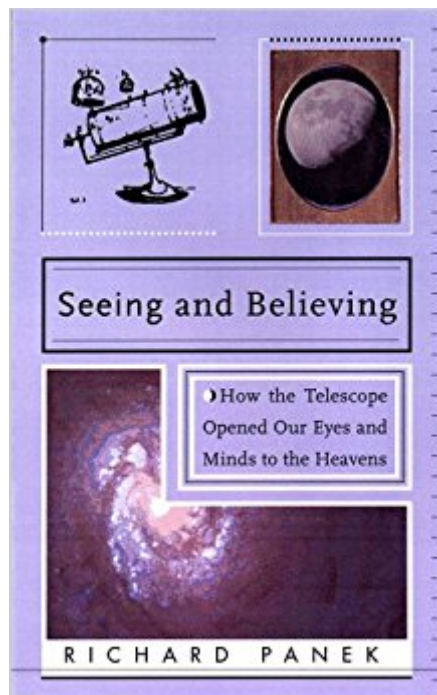


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# Seeing And Believing: A Short History Of The Telescope And How We Look At The Universe



## Synopsis

In 1609, Galileo fit two lenses inside a cylindrical tube, aimed it at the sky, and forever changed the world. With pith and charm, *Seeing and Believing* tells the story--era by era, visionary by visionary, technology by technology, and discovery by discovery--of how the telescope has changed the way we look at ourselves. In the tradition of Dava Sobel's bestselling *Longitude*, it focuses on the often larger-than-life figures behind our cosmological odyssey--from Galileo and William Herschel (the musician-turned-astronomer who discovered Uranus) to the crazy brilliance of George Ellery Hale and the minds behind the mighty Hubble space telescope. Seamlessly fusing elements of philosophy, politics, literature, and religion, this fascinating narrative chronicles the humbling journey into a universe infinitely more vast than we ever imagined. Star-gazers, space enthusiasts, and curious minds of every sort will love this holiday and year-round gift.

## Book Information

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## Customer Reviews

Journalist Richard Panek begins his historical essay on the telescope with the Hubble Deep Field. This extended exposure by space telescope is a picture that looks out of our galaxy--farther, immeasurably farther, than the human eye has seen before. It exemplifies the purpose of all telescopes: "To address our place in the universe, literally. To size up all of space and figure out where we are in it." How and why did this particular technology have such profound effects? Panek first considers Galileo, who "raised his new instrument toward the night sky and understood at once that there was more to see--and more to seeing--than meets the eye.... Unlike spectacles or

magnifying lenses, the optic tube offered not just a distortion of what was already there, but more. It revealed evidence that was different from what the naked eye could see, evidence that wasn't otherwise there." Panek goes on to look at the, ahem, luminaries of observational astronomy--William Herschel, George Ellery Hale, Edwin Hubble--showing how faith in the telescope grew and our mental image of the universe expanded until "all the assumptions safely based on observation are gone." Panek's prose is vivid and beautiful, sustaining this (curiously) unillustrated book as it traces the astronomer's quest for light and dark, sight and belief. --Mary Ellen Curtin

Panek's concise, popularly written history of the telescope is an exciting interstellar voyage that shows how a humble novelty item and maritime tool evolved into a powerful exploratory instrument that has changed our conception of the cosmos. Although Galileo's discovery of Jupiter's moons with a spyglass in 1610 helped demolish the medieval worldview that placed a stationary earth at the center of creation, faulty lenses and frustrating optics hobbled astronomical research for decades. Amateur astronomer William Herschel's discovery of Uranus in 1781 led to his pre-Einsteinian insight that stargazers were not only looking tens of trillions of miles into space, but also penetrating into time past. Yet, incredibly, as recently as the turn of this century most astronomers clung to the belief that the universe consisted of just one galaxyAoursAwith the sun in a central position. In 1996, the Hubble Space Telescope pierced the heavens, resulting in the current estimate of a total of 50 billion galaxies. Panek (Waterloo Diamonds), contributing writer at Elle and Mirabella, puts these and other conceptual breakthroughs into clear perspective as he deftly explains how astronomy's interface with photography, spectroscopy, radio and space exploration led to the discovery of quasars, pulsars, black holes, galaxy superclusters and the search for "dark matter." His narrative sometimes bogs down in technical detail, but, nonetheless, it is a delightful intellectual adventure, fleshed out with vivid cameos of innovators like Tycho Brahe, Edwin Hubble and visionary astrophysicist George Ellery Hale, who in 1948 supervised the construction of what was then the world's largest telescope at Mount Palomar, but whose mental illness made him report that he was suffering periodic visits from an elf. Agent, Henry Dunow. Copyright 1998 Reed Business Information, Inc.

A great read. Highly recommend to anyone into astronomy and the history of the telescope!

Wow...some of those lights are actually ...other Earths? Galileo and his contemporaries opened up

the door for people to confirm what they've read in scripture and to get, for the first time, perspective on \*size\* and \*distance\*. Suddenly the moon had a very "lined" countenance and Mars was a different color from the moon. And the starry backdrop begged the question: does intensity of light betray closeness? Hubble is the new "basic" telescope. And we still can only see a tiny spec from which to guess on the size of this mess. If we can say there are an approximate number of stars in this part of the picture, then what of \*the\* picture? And are there countless pictures? Read this poetic..but not \*easy\* book. Just like the early views into space - it requires reflection.

The best part of Seeing and Believing is finding out how the telescope changed astronomy not once but many times: Each new technical development led to a new vision of how the Universe is put together. I'm tempted to say that this book is a little dry, but I won't: It's a history of the telescope for goodness' sake. If you are interested in how the telescope came to be and how it (literally) changed how we see the universe, then this is the book for you.

On first picking up this book, I expected it might be a dry, technical read--even for me, a lifelong amateur astronomer who has some familiarity with telescopes. But Panek is interested not so much in the telescope as a piece of technology as in how, at certain moments in history, it has transformed the way our species saw its place in the universe. Today we don't think twice about using scientific instruments to extend our physical senses. In 1609, as Galileo first turned his telescope to the heavens, such an experience was almost unknown. Not only did a telescope make known things--like ships--appear bigger, but it brought into view things which were previously unknown: spots on the sun, mountains on the moon, thousands of never before seen stars in the Milky Way and four moons orbiting Jupiter. Was this just a trick of the instrument? Was the ambitious and disdainful Galileo deceiving them? It was a huge conceptual leap for the average citizen of the 17th century to make: that the nature of the universe could be unraveled by means other than logic, traditional knowledge and the unaided human senses. Indeed many considered as sacrilege the notion that mere mortals could, by technological means, peer deeply into God's plan. Panek relates with flair the contributions of many great astronomers and observers after Galileo with a special emphasis on William Herschel and George Hale whose commitment to building the finest instruments possible did so much to advance astronomy. A favorite part of the book is when Panek tells of the introduction of photography to astronomy. Suddenly mankind needed no longer to be reliant on individual observers who, being human, could make mistakes, e.g. Percival Lowell's Martian canals. Instead, photos allow a permanent record to be made and

kept for later, careful study. Still, many astronomers of the time were skeptical. As stubborn as any 17th century clerics, many regarded photographic astronomy as a fad; they insisted that any 'real' astronomy still needed to be done via an observer looking through a lens. (The notion that mankind is centre of all things persists throughout the ages.) Panek's *Seeing and Believing* is beautifully written and exquisitely researched. It brought me to a new and deeper appreciation of how mankind has learned to see and the difficult and sometimes painful journey towards believing.

I've read a lot of books about telescopes and the history of astronomy so I was somewhat skeptical that this small format text from 1998 would be all that interesting. But it only took a few pages' reading to realize that this book was something special. It is not a bare bones recital of the standard history you read in other books, where other books summarize Galileo and the telescope in a sentence or two and then move on, Panek devotes about a 1/3 of the book to what happened *after* Galileo made his telescope but *before* the next advance in telescope design. What happened was that astronomers changed their whole way of thinking about the universe, starting with convincing themselves that the image in the telescope was actually a reality, and not some distortion of their vision. When refracting telescopes were improved later, astronomers dismissed them because the image was upside down! It was only years later that they realized it didn't matter in astronomy what was up and what was down. I've never read about this in any other books. In addition to an in-depth study of the Galileo period, William Herschel gets a large portion of the book. This is also fascinating and new because most books mention his work (a huge star catalog, discovery of Uranus), but little about the man himself. It's interesting to see here how a musician giving 8 lessons a day becomes the astronomer to the king. Lastly Hale and Hubbard get their due. Again with more insight into Hale than I've gotten out of hour-long documentaries on TV. It helps to have been exposed to some of this material elsewhere, since this book had no illustrations or photos. But it certainly fills in some gaps in history that you will find interesting.

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