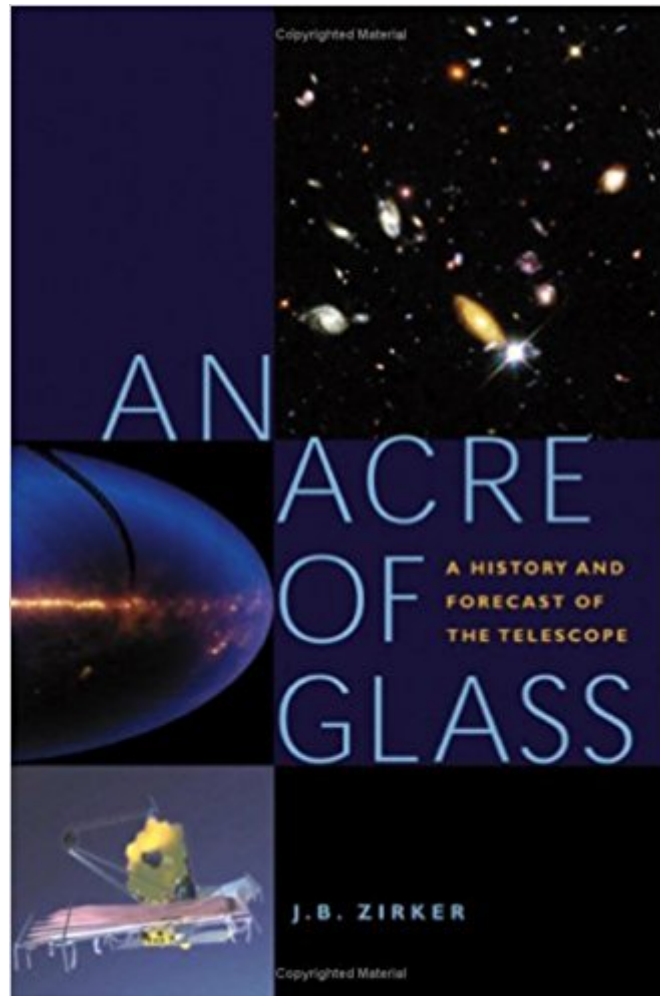




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An Acre Of Glass: A History And Forecast Of The Telescope



Synopsis

Ever since Galileo glimpsed the moons of Jupiter through his tiny telescope, astronomers have striven to understand how the universe is constructed and how it evolves. Every increase in the size and power of telescopes has led to new discoveries. Within the last century, telescopes have enabled us to learn about pulsars, quasars, gamma-ray bursters, black holes, and the acceleration of the universe's expansion. *An Acre of Glass* describes how recent innovations in telescope technology have led to the construction of giant, ground-based observatories and to an explosive development of astronomy. Today, telescopes with mirrors 30, 50, and even 100 meters in diameter are being built. Optical interferometers that cover an acre of ground are observing every night. J. B. Zirker shows us how telescopes past, present, and future are built and describes the exciting science they reveal—from planets beyond our solar system to supermassive black holes at the core of distant galaxies. For every striking image revealed through these enormous telescopes, technicians and scientists must overcome unique and incredible challenges. How many pack animals does it take to get a telescope to the top of a mountain? How do you make the shape of a 6-foot-wide mirror accurate to within a 1,000th the thickness of a human hair? In clear and accessible language, Zirker answers these questions and more, providing fascinating technical detail about how a telescope is made and what the next generation can hope to see.

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Customer Reviews

Provides an accessible yet detailed story of how telescopes are made, the science behind their

function, and their promise for future astronomical discoveries. (Science News)Zirker has succeeded in bringing together the past, present and future in this compact and readable book. Through the telescopes, he tells of the people, the science, the technology, the problems, and the future. If you have only one book on the history of astronomy, this should be it. (Charles J. Vukotich, Jr. Astrophile)An excellent guide to how modern astronomy has been pushed by telescope advancement. (James A. Cox Midwest Book Review)Fascinating technical details about how a telescope is made and what the next generation can hope to see. (Lunar and Planetary Information Bulletin)The book provides an excellent, easy-to-read overview of this and other 20th century telescopes and explains how the major observatories have developed around the world. (Mark Williamson International Space Review)The first paragraph describing a sunset on Mauna Kea is written more in the style of an introduction to a novel than the start of a textbook on astronomical telescopes... I enjoyed this book immensely and recommend it to anyone with an interest in how telescopes are built. (Journal of the British Astronomical Association)A handsome and well-presented book... There is no doubt that An Acre of Glass deserves a place on the shelves of all astronomical libraries. (Fred Watson Observatory Magazine)A wonderfully accessible introduction to the field. (Deborah Jean Warner Technology and Culture)Zirker's An Acre of Glass provides a good overview of post-Palomar era observational astronomy, the ins and outs of its technologies, and a useful entry point into the personalities that drove these impressive developments. (Gregory Good Quest: History of Spaceflight Quarterly)

J. B. Zirker, former director of the National Solar Observatory, is the author of Sunquakes: Probing the Interior of the Sun (Johns Hopkins); Journey from the Center of the Sun; and Total Eclipses of the Sun.

After a brief history of the telescope, this is an excellent overview of modern developments in the design and building of telescopes, both ground-based and space telescopes, as well as a discussion of those under construction or planned. Observations that were unthinkable 40 years ago are now routine with new techniques such as interferometry and adaptive optics. Jack Zirker has a facility of explaining complicated ideas and making them accessible to those interested in science or engineering at all levels, but without any "dumbing down.". He also takes time to explain the science that is or will be done with the instruments he describes, thus putting them in proper context. The narrative is greatly enlivened by giving details about the people responsible for the designs and building of these gigantic telescopes, and giving credit where credit is due. I loaned the

book to an engineering friend who is equally enthralled, and marvels as I do at what has and is being accomplished. Anyone who wants to know what has made possible many of the extraordinary discoveries in astronomy in the past 30 years can't do better than reading this book.

Everything anyone might want to know about the mind boggling Renaissance were undergoing in astronomical technology. Well written in that it discusses people as well as tech.

good book on modern and future telescope designs

Excellent history of optical telescopes. also excellent survey of modern monolithic mirrors with description of the segmented telescope.

The good things about this book include the sheer range and volume of descriptive material, the copious collection of photographs, diagrams, and illustrations, and the connections the author makes between telescope technology and scientific discovery. My concerns about this book include a certain lack of organization of the material that other reviewers have noted and a lack of tight editing in places. For example on p114 the book says Richard Feynman "identified" the cause of the Challenger disaster. In point of fact the causal link was pointed out to Feynman by those on the inside who understood what had happened and Feynman did a great service by pointing out this out publically in a vivid and unforgettable way. What this digression had to do with telescope technology is unclear at best. On page 85 in discussing the Blanco 4m telescope at Cerro Tololo the text says "a large team from the Lawrence Berkeley National Laboratory announced in 1998 that the expansion of the universe is accelerating. They based their findings on observations made with the Blanco telescope of over seventy five supernovas at huge distances." On page 148 the book then correctly states there were two teams, the Super Nova Cosmology Projects and the High Z Supernova Search and then says "Both groups have used lots of time on 4 meter telescopes, such as Blanco at Cerro Tololo..." and then names others. So how hard would it have been on page 85, as the installation at Cerro Tololo is being described, to have said something like "The two teams using supernova observations to quantify the expansion of the universe at very high red shifts are both using data from the Blanco telescope." This would have avoided the impression made on p 85 that the SNCP was the sole discoverer, an impression certainly dispelled by the award of the Nobel Prize to members of both groups. These may seem like nitpicking observations but one would think that Trevor Lipscombe, having edited three previous books by this author, would be familiar enough

with the subject matter to pick up things a knowledgeable layman would know. One interesting point to recognize is that the somewhat journalistic style of this book and its publication date of 2005 render it inevitably dated. This is particularly the case with respect to the timelines of future big telescope projects, all of which have slipped considerably since then. That is not entirely surprising considering the history of most all big engineering projects these days and one might have thought the author could have noted that a time or two. One final point I would like raise is more one of wishing the author had written a different book, given his overall knowledge. That is, I think that in the technical notes at the end of the book, he could have gone ahead and used some of the simple formulae of geometric optics to give a more complete view of why things are done the way they are. I know the author and editor were proceeding on the assumption that one formula reduces the readership by a factor of ten, surely tucked away in an appendix they do less harm and provide a more complete experience for some of the readers. Please understand my three star rating to mean that this is an interesting book I would encourage anyone with an interest in the subject to buy, particularly given the low prices at which it is available. However it is not the last word nor the only book you would want to read on the subject.

As the title "An Acre of Glass" suggests, this book is primarily about the building of ever-larger optical telescopes around the world. The author does a credible job with the story, with accurate discussions and generally good writing. If anything detracts from the reader's experience it is the author's diversions into other stories. He breaks the central story between Palomar and the next generation of observatories with a chapter on radio astronomy and an assortment of other astronomy achievements. All important stuff, but just a distraction in this book. It would have been better to have spread the material through the book, or have placed it in an appendix. The chapter on the Hubble space telescope seems similarly perfunctory. I think the book would have been stronger if the author had remained focused on his real story and resisted the urge to pretend to cover a larger subject. But people interested in the development of ever larger optical telescopes will still enjoy this book.

In this relatively detailed work, the author discusses the history of the telescope. This history is heavily slanted towards the past century, with much detail provided on developments in recent decades; forecasts for the foreseeable future are also presented. Although optical telescopes, and related apparatus, take center stage, radio telescopes are also discussed. A set of short notes in the back of the book provides clear and concise explanations of some of the items presented in the

main text. The author writes very clearly and in an engaging style; he succeeds admirably in conveying the excitement of both furthering the technology as well as using it to deepen our knowledge in the fascinating field of astronomy. Plenty of photos and diagrams complement this excellent work. I believe that this book can be of great interest to a wide range of readers, but it will be most easily accessible to science buffs, especially those already acquainted with the basic physical principles that are central to astronomy and astronomical observation.

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