

BOOK REVIEWS

Star Maps: History, Artistry, and Cartography, by Nick Kanas (Springer Praxis Publishing, 2007), pp. 382, appendices, index, 207 illustrations. ISBN 978-0-387-71668-8 (softcover), US\$34:95, 240 x 165 mm.

San Francisco Bay Area author Nick Kanas is an avid collector of celestial maps and charts. He has taken his many years of collecting expertise and condensed it into a marvelous book on this fascinating aspect of enjoying the night sky (for a reproduction of the front cover see Figure 1). His book is filled with 207 color and black & white images of celestial maps from all ages. The surviving celestial maps from Mesopotamia, Egypt, China, India and other ancient cultures influenced Greek, Roman, and Islamic sky watchers who in turn produced their own representations of the night sky. Once knowledge of these earlier maps became known to Renaissance European cartographers, the art and craft of representing the night sky on paper reached a high point of refinement, and their maps have become highly prized collectors items, not only for showing the heavens but for their artistry as well.

From the opening chapter devoted to explaining the difference between celestial and cosmological maps to the final chapter covering modern maps and atlases, you will find something fascinating on almost every page. The author describes the maps for each period and talks about how particular map styles were developed over the years and the relationships between them. Where a map or chart is illustrated, he discusses details shown on the map and gives you a good understanding of the map's place in cartographic history. As you progress through the ages, you can see how one age influences the work of later eras. I found this to be a very fascinating aspect of this comprehensive work. I have read a number of books on the history of celestial cartography, but none with the depth and wealth of information on this important part of the history of astronomy.

One of the appendices lists celestial cartographers in alphabetical order, and includes information on the works that each individual produced. This is certainly a very useful part of this book. Another appendix provides tips on collecting celestial maps and what pitfalls to avoid.

Mr. Kanas presents a vast and valuable body of knowledge on this subject and has done so in a lucid manner that I found very easy to follow and a real joy to read. Even though the small size of the book meant that images of the maps would be small, they are reproduced to such a fine point that details on all of them remain easily readable. I highly recommend this book to students of the history of astronomy or anyone interested in observing the night sky.

Robert A. Garfinkle

32924 Monrovia Street, Union City, CA 94587, USA.

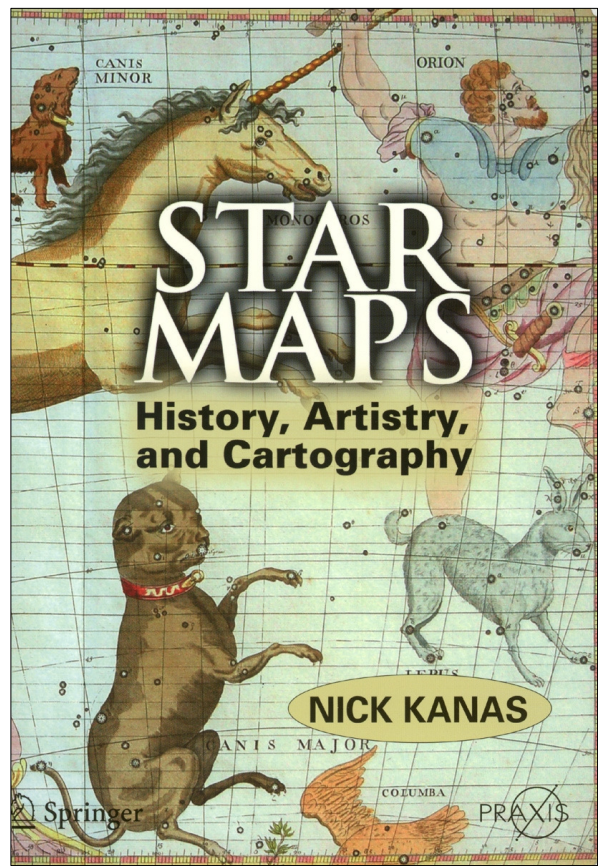


Figure 1: The attractive front cover of Nick Kanas' book.

Proxima: The Nearest Star (Other Than the Sun!), by I.S. Glass (Cape Town, Mons Mensa, 2008), pp. viii + 88, ISBN 978-0-9814126-0-3 (paperback), \$R100 + postage & charges etc. (available from glass.ian@gmail.com), 210 x 148 mm.

Every astronomer knows of Proxima Centauri, that supposed wayward sibling of Alpha Centauri and the closest star to the Earth after the Sun, but how many know the fascinating history of its discovery? There can be no excuse now that IR astrophysicist and historian of astronomy, Ian Glass, has prepared a charming little book on the subject. Ian hails from the South African Astronomical Observatory in Cape Town, and how particularly appropriate given that South African-based astronomers were intimately involved in the initial investigations of both Alpha Centauri and Proxima.

Apart from introducing the concept of parallax and discussing 61 Cygni, the first two chapters in *Proxima: The Nearest Star* ... focus on Alpha Centauri and introduce us in quick succession to the work of Nicolas Louis de Lacaille, Manuel Johnson, Thomas Henderson, Thomas Maclear, John Herschel David Gill and his assistant, William Elkin. Using a 4-in Repsold heliometer, Gill and Elkin derived a parallax of $0.71 \pm 0.01''$; as Glass (page 32) reminds us, this value is "... within the errors, the same as the modern one."

The saga surrounding the discovery and initial investigation of Proxima Centauri occupies the next two chapters of the book, but what makes these particularly

interesting pages is not just the scientific story but also the human drama surrounding the two leading protagonists, R.T.A. Innes and J.G.E.G. Voûte. By any criterion Robert Thorburn Ayton Innes was an exceptional character. A former amateur astronomer, this charming yet unconventional Scot emigrated to Sydney where he ran a successful wine business before obtaining a clerical post at the Cape Observatory through the services of Australia's leading nineteenth century astronomer, John Tebbutt. Innes was immersed in an affair at the time so he booked his wife into Callum Park Psychiatric Hospital in order that his mistress could accompany him and his three young sons on the voyage to Cape Town! Later he was to obtain the founding Directorship of the Transvaal Observatory in Johannesburg, where he made no attempt to hide his private life (as happily portrayed by Dirk Vermeulen in his entertaining 2006 book, *Living Among the Stars at the Johannesburg Observatory*). More conventional both in outlook and lifestyle was the Indonesian-born Dutchman, Joan George Erardus Gijbertus Voûte, who had independent means and from 1913 worked as a volunteer observer at the Cape Observatory (having previously spent several years at Leiden Observatory).

Soon after Innes announced the discovery of Proxima Centauri in *Union Observatory Circular* No. 30 in 1915, Voûte began observing it at the Cape with a view to determining its parallax. Innes did likewise in Johannesburg, and the race was on to publish. To Innes' chagrin, Voûte's paper appeared in a 1917 issue of *MNRAS* several months before his own contribution in *Union Observatory Circular* No. 40. The next 12 pages of Glass' book document the ensuing battle between these two astronomers to refine their parallax values and interpret Proxima Centauri's true status: was it part of the Alpha Centauri system, and if so was it closer to the Earth than the two principal components?

After disposing of the historical material, Glass turns his attention to "Modern studies of Alpha and Proxima" in the final chapter of his book. Table 5.1 contains 'vital statistics' on both stars, while Figure 5.2 explores the orbits of α_1 and α_2 Centauri before Glass raises that fundamental question, "Is Proxima in orbit around α ?" This is his conclusion:

[Proxima and Alpha Centauri] ... are in some way connected, whether because they are moving away together from the same place of origin or because Proxima is actually in orbit around α . Unfortunately, it is not easy to determine whether either of these possibilities holds true ... There is hope, however, that the question can be resolved with the aid of large telescopes and improved spectrographs in the not-too-distant future. (Page 75).

To those who are avid variable star observers Proxima Centauri is well known as a flare star, and Glass goes on to describe this aspect, before discussing the possibility that Proxima has a planetary system:

At present, all that can be said is that there is no planet around Proxima with a mass greater than 0.8 of Jupiter's and an orbital period in the range 1 to 2.7 years. (Page 79).

Proxima: The Nearest Star ... is a charming little book and seems designed primarily for the interested layman, yet it will appeal equally to astronomers with

a passion for the history of our discipline. I thoroughly recommend it as a valued and eminently affordable addition to your bookshelf.

Wayne Orchiston

Centre for Astronomy, James Cook University, Australia

James Van Allen: The First Billion Miles, by Abigail Foerstner (University of Iowa Press, 2007), pp. 376, ISBN 0-87745-921-5 (hardback), 978-0-87745-921-7 (paperback), \$37.50, 240 x 160 mm.

During the last 50 fifty years we have sent robotic spacecraft to explore the region near the Earth, all of the planets except Pluto, and craft that are still heading toward the outer edge of the Milky Way Galaxy. The contributions of one man, James Van Allen of the University of Iowa, set him apart from all of the other early space pioneers as the 'father of spacecraft instrumentation'. This biography of astrophysicist and space pioneer, James Van Allen, by science writer Abigail Foerstner (see Figure 2), places him in his times and beautifully tells us the history of the man and his scientific accomplishments. If you know anything about space exploration, you probably know of the Van Allen Radiation Belts that encircle the Earth, but you may not know that Van Allen is also an unsung hero of World War II.

Before I read this book, I was unaware that James Van Allen had helped to develop the proximity fuses used in anti-aircraft shells. Proximity fuses cause a shell to explode when it gets near an aircraft, so it does not have to hit the target in order to bring down an enemy plane. Shortly after thousands of these shells were delivered to the American troops in the South Pacific in 1943 the shells began failing to explode. Van Allen was sent out to the Pacific to find out what the problem was. He discovered that the batteries in the shells were deteriorating. Van Allen and a crew of Navy gunner's mates worked around the clock in the heat and sultry humidity at Tillage to replace thousands of shell batteries. The secret proximity fuse-armed shells were then very effective in shooting down hundreds of Japanese fighters in defense of our naval forces.

However, James Van Allen's greatest achievements centered around his teaching physics and astronomy at the University of Iowa, which in turn supported his efforts to explore the source of cosmic rays and his discovery of the radiation belts that bear his name. Foerstner gives life to what otherwise might be a dull reading of a scientist's life. She takes us to Van Allen's early attempts using weather balloons with instruments and a combination of weather balloon with an instrument package inside a rocket attached to the balloon. This was called a 'rockoon' and was used to lift his instruments to higher elevations than the balloons alone could go. Van Allen worked with the German scientists who were brought to the U.S. after World War II to teach us how to build and launch the V-2 rockets that we had captured. These German rocket scientists were lead by Wernher von Braun. Van Allen was able to insert various packages of Geiger counters and telemetry instruments into the rocket nose cones in furtherance of his search for the source of cosmic rays.

In addition to his teaching assignments, Van Allen also served as the head of the Physics Department and

oversaw the construction of his instruments in the laboratory and workshops located in the basement of the Physics Building. A number of his graduate students worked on the instruments at Iowa, then went on to lead other spacecraft instrumentation efforts at private and government facilities. These former colleagues kept in touch with Van Allen, and many of them came to his 90th birthday scientific colloquium celebration held in October 2004. One of the photographs in the book that I really like shows Van Allen at the colloquium holding up a T-shirt that states: "Actually I am a Rocket Scientist".

The subtitle of the book refers to the fact that when James Van Allen died at the age of 92 in 2006 his radiation detectors on board the *Pioneer 10* spacecraft were still working after 30 years in space and sending back data from a distance of over 8 billion miles from Earth. For her compelling and informative biography, Foerstner has combined the drama of early spaceflight failures and successes, 'cold war' politics that led to the 'Space Race', Van Allen's dealings with his numerous graduate students and their efforts to create the instrument packages for many of the space flights, and events in Van Allen's personal life. She was able to interview her subject for a number of years before he died and was given access to his personal journals and papers. I highly recommend this fascinating book and enjoyed my look into the life and times of one of America's greatest rocket scientists.

Robert A. Garfinkle

32924 Monrovia Street, Union City, CA 94587, USA.

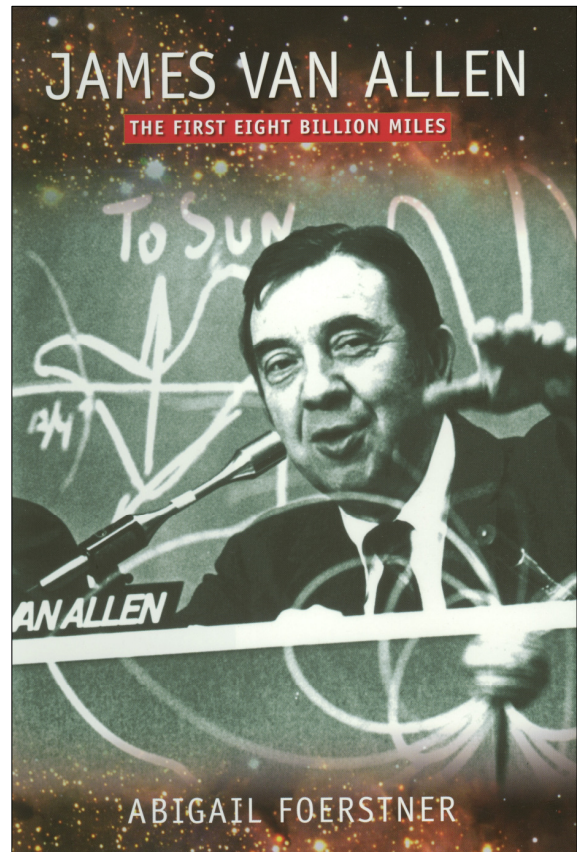


Figure 2: The front cover of *James Van Allen...*