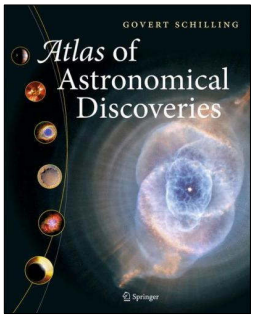
BOOK REVIEWS

***Atlas of Astronomical Discoveries,* by Govert Schilling (New York: Springer, 2011), iv + 234 pp., ISBN 978-1-4419-7810-3, US$39.95, 240 × 300 mm.**



This new book by prolific Dutch astronomy journalist Govert Schilling is a magnificent hybrid, at once a breathtakingly gorgeous coffee table book and a review of the history of astronomy since the development of the telescope in the first decade of the seventeenth century. Lavishly illustrated in a way that is increasingly rare in this post-economic-meltdown age, the book might also be called "A History of Astronomy from Galileo to Today in 100 Nutshells."

The book is divided into five sections, one for each century from 1608 to 1908, and then separate sections for each half-century from 1908 to 2008. Each 'nutshell' consists of a two-page spread, with one page devoted to a full-page photo showing off the capabilities of modern astronomical technology, and the other to two columns of text that summarize the particular scientific or technological achievement that Schilling considers a breakthrough for the profession as a whole. A second, smaller illustration appearing on the page of text sometimes makes use of historical data. Among such smaller illustrations, I particularly like Lord Rosse's 1845 sketch of a nebulous spot in the constellation Canes Venatici, marking his discovery of spiral nebulae, and Giovanni Schiaparelli's map identifying 'canals' on Mars. I admire the way Schilling's captions for both the full-page and the smaller illustrations not only identify both the subject and the source of each illustration but also include relevant additional information. For example, in the spread for 1728, on the discovery of the aberration of starlight by James Bradley, the box includes the information that the first star for which the aberration of starlight was discovered was Gamma Draconis, as well as the fact that each star in the sky shows an annual aberration in its position.

Readers of such a book, which is based on the author's own top-100 astronomical hits, are always liable to lament the absence of a personal favorite historical milestone or scientist. I regret, for example, that the only reference to Caroline Herschel—the first notable woman astronomer and discoverer, among other things, of eight comets—fails to mention her own achievements, acknowledging only that she joined her older brother William in Bath in 1772. Similarly, even if Annie Jump Cannon does not earn an entry of her own for introducing the first systematic classification of stellar spectra, Schilling might have mentioned her in his paean to the spectroscope, which he identifies as "… undeniably the most important instrument in the history of astronomy …" after the telescope. To his credit, however, Schilling does include a nice selection of women astronomers, some of whom merit their own two-page spreads (e.g. Henrietta Leavitt, Jocelyn Bell, Linda Morabito, Geneviève Soucail), while others share a spread with a male colleague (e.g. Elizabeth Scott, Louise Webster, Vera Rubin and Jane Luu), and yet others are mentioned in the text of spreads relevant to their work (e.g. Margaret Burbidge and Carolyn Shoemaker).

In addition to regretting the author's failure to include one's own favorite people from the history of astronomy, readers may also question why Schilling insists on including certain 'nutshells'. For example, why is it worth devoting a two-page spread to David McKay's seeming discovery in 1996 of signs of life in a Martian meteorite, given that "From the beginning, there is much skepticism about the interpretation of the facts by McKay's team ... As time passes, the evidence for fossilized Martian bacteria becomes less and less credible"?

These quibbles notwithstanding, I can think of no more esthetically satisfying way to review the highlights of the history of astronomy from Galileo to today than by dipping into Schilling's book. At only US$39.95 the book is also a bargain. I commend not only the author but also the publisher, Springer, for making such a beautiful book available to the public for such a reasonable price.

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***Giovanni Virginio Schiaparelli e l'Osservatorio di Arcetri,* by Simone Bianchi, Daniele Galli, Antonella Gasperini (Firenze, Fondazione Giorgio Ronchi, 2011), 87 pp., ISBN 978-88-88649-33-7, 10 Euros, 163 × 230 mm.**

It is remarkable that currently in Italy some young astronomers are carrying out historical research on the observatories where they work and on their original equipments. Therefore, research activities in history of astronomy are no longer restricted to retired astronomers, as often happened in the past, but is promoted in some cases as a result of a changing attitude and sensibility towards the conservation of astronomical heritage. It would be desirable that this promising new generation of historians of astronomy could be supported and encouraged by the management of the Italian National Institute for Astrophysics (INAF), which embodies the astronomical observatories.

For example, Arcetri Astrophysical Observatory, in Florence, is becoming a very active center of historical research. The booklet on Schiaparelli and the Arcetri Observatory is the latest work published by the history of astronomy team there, comprising astronomers Simone Bianchi and Daniele Galli, and Antonella Gasperini, who is the Observatory's librarian. This work casts a new light on the establishment of the Arcetri Observatory and the role played in the affair by the famous astronomer Giovanni Schiaparelli.

In 1873 the sudden death of Giovan Battista Donati,

who had arranged to move the Florence Observatory to the Arcetri hill on the outskirt of the town, was a disaster for the newborn observatory: the construction was still in progress and the equipment was not complete. The difficult situation required an energetic Director, someone able to achieve an observatory that would be the most modern in Italy at the time.

The authors explore a lot of correspondence and archival material to outline the acceptance and the following renunciation of the Directorship of the Arcetri Observatory by Schiaparelli, apparently for familiar reasons. Nevertheless, he strongly supported the completion of the Observatory, by agreeing to inspect the buildings, provide instruments and supervise their installation. In 1875, after visiting the Arcetri Observatory, he wrote a detailed report for the Ministry on the conditions of the facility. The importance of this document is well stressed by Bianchi, Galli and Gasperini. However, all of the recommendations made by Schiaparelli for this "… always being born but never born …" Observatory—as he defined it—were definitively disregarded in the 1920s when it was decided to build a solar tower (the first in Italy) at the Observatory, thus changing the planned research program from astrometry to solar physics.

This little book examines the background behind the lengthy construction of the Observatory as well as the role played by men and institutions, and shows how it would have been in the original plan, thus plugging a gap in the historiography of the Arcetri Observatory and providing additional information on the history of Italian astronomy in the nineteenth century. The book is well documented, with many references to archival sources, and a selection of unedited letters, as well as Schiaparelli's important report, are published in the Appendices.

After recognizing the interesting contents, a few minor remarks could be made about the editorial choices: the illustrations are not plentiful, the lack of a name index is regrettable, and a larger font size would have been appreciated.

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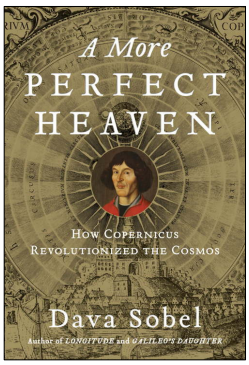
***A More Perfect Heaven: How Copernicus Revolutionized the Cosmos,* by Dava Sobel (New York: Walker, 2011), xiv + 273pp., ISBN 978-0-8027-1793-1, $25.00 (hardcover), 145 × 217 mm.**



This beautifully-written and uniquely-structured contribution to Copernicus studies is essentially a homage to discipleship. Not exactly a straightforward biography of Copernicus, the heart of this book is a two-act, six-character, play about what might have happened when the young mathematician Georg Joachim Rheticus arrived in Frauenburg (now Frombork, Poland) in 1539 to convince the much older Nicholas Copernicus, about whose heliocentric cosmology he had heard, that he must overcome his reluctance to publish his work. The play is bookended by two sets of six chapters, the first set taking us from Copernicus's birth up to the time of Rheticus' unannounced visit, and the second bringing the story up to our own time. As Dava Sobel (prize-winning author of *Longitude* and *Galileo's Daughter,* among other books) notes in her preface, the idea of dramatizing this "… unlikely meeting …" first occurred to her in 1973, when the world celebrated the 500th anniversary of the birth of the man who made the Earth into a planet. She attributes the bookends concept to her editor, who argued that readers would benefit from the play being rooted in "… a fully documented factual narrative …" that not only tells Copernicus' life story but also outlines "… the impact of his seminal book, *On the Revolutions of the Heavenly Spheres*, to the present day."

In the summer of 2008 I saw a staged reading of an earlier version of the play, then and now called "And the Sun Stood Still", at the University of Zielona Góra in Poland, during a conference commemorating the 380th anniversary of Kepler's arrival in nearby Sagan (now Żagań). Much as I enjoyed that student production, I can report that over the intervening years the play has become more effective. Though some might find the emphasis on Rheticus' homosexuality and the liaison between Copernicus and his housekeeper, Anna, distracting, Sobel does a fine job of conveying the fact that world-altering work often takes place against the background of political and religious turmoil, with the human erotic impulse frequently complicating matters still further. While Sobel both telescopes the timeline and takes liberties with some historical facts, I can imagine professors assigning the play to their students, asking them to read the bookended material to see where playwright Sobel deviates from the facts biographer Sobel presents, and urging them to evaluate those artistic choices.

Though during Copernicus' lifetime, Rheticus was his only disciple, Sobel's concluding chapters clearly demonstrate that the line of Copernican disciples has continued over the centuries into our own. Of Rheticus' discipleship, we learn of the guilt he felt for not seeing through to the end his self-imposed task of proofreading the pages of *On the Revolutions* as they came off the printer Petreius' Nuremberg press. With Rheticus' departure in the fall of 1542 for a prestigious and well-paid teaching position at the University of Leipzig, the remainder of the proofreading was done by Petreius' friend, theologian Andreas Osiander. When *On the Revolutions* was finally published in March 1543, Rheticus was horrified to discover the inclusion of an anonymous note asserting that Copernicus' hypotheses "… need not be true nor even probable. On the contrary, if they provide a calculus consistent with the observations, that alone is enough." Rheticus suspected, but had no proof, that Osiander was responsible for the offending Preface, to which Copernicus would never have agreed. Kepler, a true Copernican disciple, had both proof that Osiander was the perpetrator and the opportunity to exact revenge. As chance would have it, Kepler obtained a second-hand first edition of *On the Revolutions*, whose previous owner, a Nuremberg mathematician, had written Osiander's name above the anonymous note. When Kepler's own *New Astronomy* was published in 1609, bringing Copernicus' work closer to completion, he attacked Osiander on the verso of the title page, thus also fulfilling Rhet-

icus' wish.

Sobel next turns to Galileo, who suffered for his conviction that

> To ban Copernicus now that his doctrine is daily reinforced by many new observations and by the learned applying themselves to the reading of his book ... would seem in my judgment to be a contravention of truth.

In our own times, Sobel adds Harvard-Smithsonian Center for Astrophysics astrophysicist and historian of science Owen Gingerich to the list of disciples, for his decades-long effort to track down all extant copies of the first two editions of *On the Revolutions* and to study all the marginal notes their owners made in them as a way of disproving Arthur Koestler's assertion that Copernicus' masterpiece was "… the book that nobody read."

Sobel's book ends on what might seem a downbeat note, attributing to Copernicus the initiation of "… a cascade of diminishments …", taking human beings from the center of the Universe and thrusting them into a cosmos dominated by unseen dark matter and "… the still more elusive entity, dark energy …" in which "… the very notion of a center no longer makes sense." This picture, however, seems to me merely to suggest that there is much work for future Copernican disciples to undertake. By the time we celebrate the 500th anniversary of the publication of *On the Revolutions* in 2043 and the 600th anniversary of Copernicus' birth in 2073, which Copernican disciples will have made what contributions to our understanding of dark matter and dark energy? Stay tuned ...

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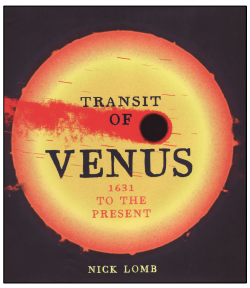
***Transit of Venus 1631 to the Present*, by Nick Lomb (Sydney, New South Publishing, 2011), 228 pp.; ISBN 9 781 74223 269 0, AU$49:95 (hardback), 237 × 237 mm.**



With the plethora of transit of Venus books prompted by the 2004 event, I really was not looking forward to the appearance of yet another volume, destined for the 2012 transit market, but Dr Nick Lomb's *Transit of Venus 1631 to the Present* came as a pleasant surprise.

Penned by the talented recently-retired Curator of Astronomy at Sydney Observatory, this book is a beautifully-produced and copiously-illustrated tome which—after an introductory chapter—takes us through the all-too-familiar story of the historic transits, from 1639 to the 1874 and 1882 events. Then we are introduced to the "Space-age transit: 2004" and provided with pointers for observing the 2012 transit on June 5/6. This is followed by a 2-page Glossary, four pages of references, and the all-important Index.

Although the basic 'story' of the historic transits is well known to those of us who research and write on these rare events, there are two features of this book that make this compelling reading nonetheless. One is the range of stunning photographs—many in colour—that support and embellish the text. The other notable feature relates directly to my own Antipodean research focus (so some will see this as an obvious bias), and this is the detailed coverage given to Australian and New Zealand observations of the 1874 and 1882 transits. In these two chapters, Nick Lomb has drawn freely on the wealth of pictorial material (much of it in colour) assembled by former Sydney Observatory Director H.C. Russell when preparing his popular book about the 1874 transit, which was finally published in 1892. But this very focus also underscores a weakness of this book, for although it provides a basic account, those wanting further details are hampered by a limited and rather selective bibliography. For example, an extensive published overview of the 1874 and 1882 transit observations made in Australia and New Zealand (Orchiston, 2004) is not mentioned, nor is the detailed account of the US 1874 transit program published by Dick et al. (1998). And although the focus is on the British and US observations of these two transits, Chauvin's (2004) outstanding book about the 1874 Hawaiian observations is conspicuously absent from the bibliography. There is also a wealth of literature on 1874 transit observations made by astronomers from other nations (e.g. see the lists of references in the various reports of the IAU Transits of Venus Working Group, published in this journal), but this is hardly mentioned.

This selective bibliography is also an issue in considering Cook's observations of the 1769 transit, where the invited 'Cook paper' (Orchiston, 2005) presented at a Transit of Venus Conference organized by the International Astronomical Union in 2004 is ignored (along with most other papers in the conference proceedings). Another key reference that is missing is Howse and Murray's (1997) reanalysis of the Tahitian data, where they show how accurate the original observations were, notwithstanding Cook's impression to the contrary. For example, Howse and Murray derive a value for the solar parallax of 8.78″ which compares very favourably with the currently-accepted figure of 8.794148″ that was adopted by the IAU in 1976.

These quibbles aside, *Transit of Venus 1631 to the Present* is a beautifully-illustrated book that does provide an overview of the historic transits, and it also presents useful material for those planning to view the 2012 transit. On this basis, it deserves to be on the bookshelf of every astronomer with a passion for these rare astronomical events.

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