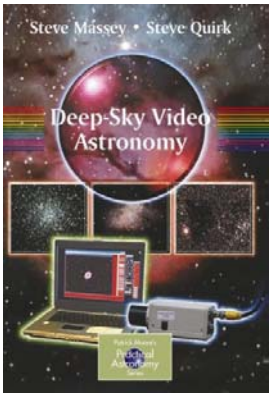
Deep-sky video astronomy

by Steve Massey & Steve Quirk

Springer-Verlag, 2009. ISBN 978-0-387-87611-5. Pp xvi + 185, £22.99 (pbk).

The main tenet of this book is that it is possible to produce outstanding images of deep sky objects using CCD video cameras. These cameras are a spin-off from the security CCTV industry, where extreme sensitivity is required for low light conditions. They are well suited to astronomical imaging but, through mass production, are cheaper than integrating CCDs. Since these cameras run at standard video frame rates, multiple frames can be captured, stacked, and processed to produce images approaching the quality of integrating CCDs.

The book follows the format of other textbooks on integrating CCDs, but emphasising the differences of video CCDs. It starts by explaining the workings of different types of video CCD chips. Then the different types of camera are described. The authors restrict themselves to frame accumulating cameras. These operate at normal video rates but, like integrating CCDs, can also be set to accumulate video frames, making them suitable for deep sky imaging. Popular makes described are the Watec, Mintron, Stellacam, and GSTAR-EX. The latter, available in Australia, is used as their main example, but the concepts apply to the other cameras. Brief reference is made to 'The Imaging Source' cameras and webcams but neither is covered further, as neither have composite video outputs.



Chapter three covers video capture to PCs including digitisation hardware and software. However the description of some topics is so detailed it may confuse the reader rather than clarify. Chapter four explains the telescope/camera interface – real-time display, focal reducers, filters, and dark and flat frames. The next two chapters cover image processing in very great detail in similar style to standard image processing texts. There is a disappointingly short chapter covering other applications such as occultation timing, meteor recording, and telescope guiding. Finally, there is a Gallery of deep sky images, and a comprehensive glossary.

The authors are well known for their astronomical imaging. Steve Massey is the author or co-author of many astronomical publications. Steve Quirk has been an avid astrophotographer for nearly 30 years, with his images appearing in many periodicals and books. The authors cram in a huge amount of technical detail covering every aspect of imaging with these cameras. The book is profusely illustrated, with diagrams and images on most pages.

The book is written in a free-flowing narrative style with few errors. It is recommended for those interested in starting video imaging, and experienced imagers should find much of interest in the detail.

Andrew Elliott

Andy Elliott is a retired veterinarian with a lifelong obsession in astronomy. In the late 1980s he was a pioneer in the use of CCD video cameras for precision timing of occultations, and is currently the Association's Occultation Coordinator.