

About this book...

This book is about imaging and manipulating images – making good images, extracting data, and enhancing what can be seen. It is an in-depth analysis and exploration of how image processing works, a book that is not afraid to dig into the math and show you the algorithms that enable you to measure and manipulate images.

Why image processing? Because digital imaging has transformed astronomy. To make the most of CCD imaging, you need understand what's inside the camera and inside the software. Empowered amateur astronomers today have more computer power sitting on their desks than the mission computers at the Jet Propulsion Laboratory had during the Voyager flybys of Jupiter and Saturn. The tools and the know-how to measure and manipulate images are available in this book to anyone who seriously wants to learn them.

In this book you will learn about the incredible potential that digital imaging has unleashed in astronomy. Today, students and astronomers of all types undertake observing projects that would have been unimaginable a decade ago. Imagine yourself resolving sub-arc-second details on the planets, measuring the motions of nearby stars, uncovering scores of new asteroids, recording 21st magnitude stars, charting the ups and downs of variable stars, and finding supernovae! No longer is taking and analyzing high-quality data restricted to professional astronomers.

Some of the topics covered in detail in the *Handbook of Astronomical Image Processing*:

- Astrometry: Measure coordinates of celestial objects
- Photometry: Determine magnitudes of variable stars
- Spectroscopy: The last great frontier for amateurs
- Image Analysis: Quantifying digital imagery
- Point Operators: Powerful tools for deep-sky imaging
- Color Imaging: Learn color theory and color practice
- Deconvolution: Used by the Hubble Space Telescope
- Linear Operators: Software tools for image enhancement
- Fourier Transforms: the hidden world of "frequency space"
- CCD Cameras: How to make great images

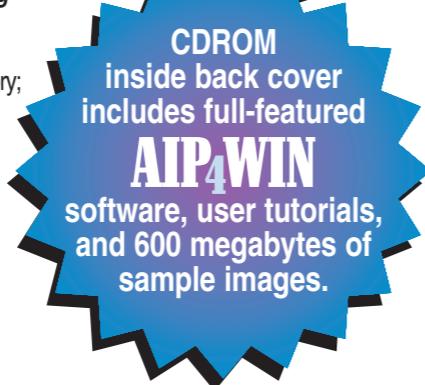
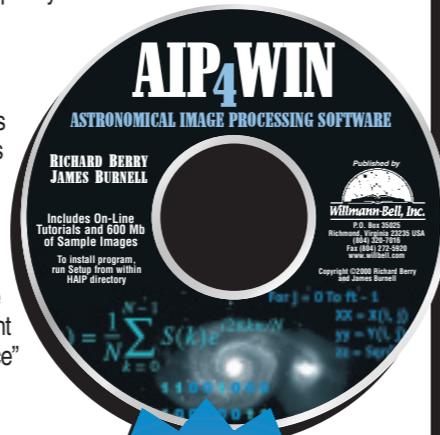
The *Handbook of Astronomical Image Processing* and *AIP4WIN* are complementary parts of a total package for learning about imaging and image processing. The book provides background and theory; the software puts powerful image processing tools at your fingertips. The book is not a manual for the *AIP4WIN* program – you'll find that in the extensive Help file – but an exploration of the measuring tools and enhancement algorithms common to all image processing software, whatever software package you happen to be running.

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THE HANDBOOK OF ASTRONOMICAL IMAGE PROCESSING

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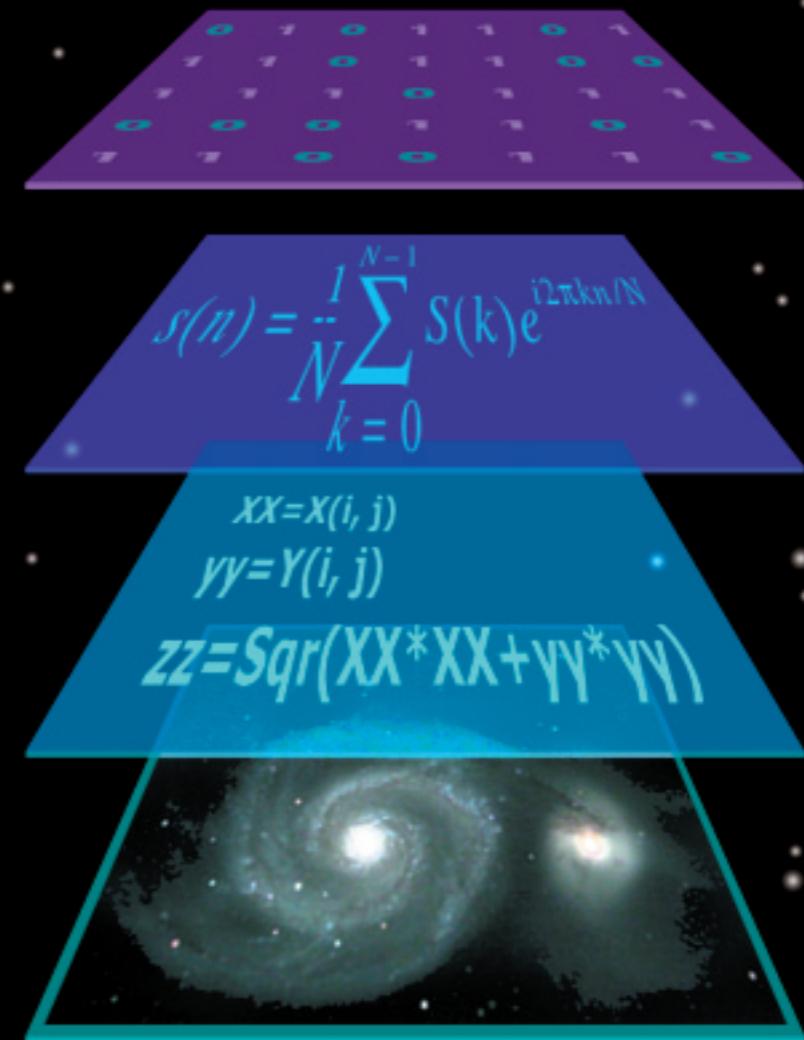
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Includes **AIP4WIN** Software

Demystifies the basic geometric operations used in astronomical image processing. Point Operations: Learn how software converts the pixel values your CCD camera captures into the sparkling images you see in popular magazines and amateur websites. Remapping, transfer functions, linear, log, and exponential scalings explained. Pre-processing is just the beginning of the astronomical image process. A different set of processing tools is then also available in Siril intended to produce high quality web publication. LUCKY IMAGING. Deep-sky lucky imaging processing speed operations. Thanks to the ability to directly process SER videos, Siril is really adapted to the deep-sky lucky imaging technic. All algorithms work use all cores of the computer, it is then possible to process more than 60 000 frames with no effort. FILE FORMAT.