



Contents

1	The Joy of Image Processing	1
2	A Digital Image – The Basics	3
3	Choosing Your Camera	9
4	Acquiring Images	19
5	What Is Best for	27
	The Moon and Planets	27
	Deep Sky	29
	Aurora and Meteors	30
	The Sun	31
	Comets	32
6	Displaying Images	35
7	Image Reduction	37
	The Importance of Dark Frames	37
	Taking Your Dark Frames	40
	Creating Master Darks	41
	Flat-Fields	44
	Processing Your Flat-Field	47
	Bias Frames	48
	Image Transformations	50
	Image Stacking	51
	Image Mosaicing	56

x **Contents**

Automated Image Reduction	61
Image Handling	63
Histograms	65
Brightness Scaling	67
False Color Rendition	71
8 Other Techniques	75
Statistics	75
FITS Editor	76
Pixel Editing	77
Bloom and Fault Correction	77
Night Visualization	79
Profiles	79
Isophotes	79
Polar Representation	79
Bas Relief and 3D	81
Blinking	82
DDP	84
Edge Detectors	84
Masks and Blending	86
9 Image Enhancement	87
Background Gradient Removal	88
Image Sharpening	91
Image Smoothing	92
Median Filtering	93
Unsharp Masking	95
Image Deconvolution	97
10 Handling Color Images	101
Acquiring Color Composites	101
Processing Color Composites	104
Achieving Color Balance	106
Narrow-Band Filter Composite Images	108
11 Handling Image Sequences	113
Image Acquisition	113
Image Quality Techniques	115
12 Astrometry and Photometry	121
13 The Problems	127
14 Postscript	129
15 Notes on Image Contributors	131

Contents xi

16 Appendix	133
Software	133
Hardware	137
Further Reading	138
Acronyms and Abbreviations	139
Index	141