

Practical Amateur Astronomy

Digital SLR Astrophotography

Michael A. Covington



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In the last few years, digital SLR cameras have taken the astrophotography world by storm. It is now easier to photograph the stars than ever before! They are compact and portable, easy to couple to special lenses and all types of telescopes, and above all, DSLR cameras are easy and enjoyable to use. In this concise guide, experienced astrophotography expert Michael Covington outlines the simple, enduring basics that will enable you to get started, and help you get the most from your equipment. He covers a wide range of equipment, simple and advanced projects, technical considerations, and image processing techniques. Unlike other astrophotography books, this one focuses specifically on DSLR cameras, not astronomical CCDs, non-DSLR digital cameras, or film. This guide is ideal for astrophotographers who wish to develop their skills using DSLR cameras and as a friendly introduction to amateur astronomers or photographers curious about photographing the night sky. Further information, useful links, and updates are available through the book's supporting website, www.dslrbook.com.

MICHAEL COVINGTON, an avid amateur astronomer since age 12, has degrees in linguistics from Cambridge and Yale Universities. He does research on computer processing of human languages at the University of Georgia, where his work won first prize in the IBM Supercomputing Competition in 1990. His current research and consulting areas include computers in psycholinguistics, natural language processing, logic programming, and microcontrollers. Although a computational linguist by profession, he is recognized as one of America's leading amateur astronomers and is highly regarded in the field. He is author of several books, including the highly acclaimed *Astrophotography for the Amateur* (1985, Second Edition 1999), *Celestial Objects for Modern Telescopes* (2002) and *How to Use a Computerized Telescope* (2002), which are all published by Cambridge University Press. The author's other pursuits include amateur radio, electronics, computers, ancient languages and literatures, philosophy, theology, and church work. He lives in Athens, Georgia, USA, with his wife Melody and daughters Cathy and Sharon, and can be visited on the web at www.covingtoninnovations.com.

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Soli Deo gloria

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Preface

Digital SLR cameras have revolutionized astrophotography and made it easier than ever before. The revolution is still going on, and writing this book has been like shooting at a moving target. New cameras and new software are sure to become available while the book is at the factory being printed. But don't let that dismay you. All it means is that we'll have better equipment next year than we do now.

This book is not a *complete* guide to DSLR astrophotography; the time is not yet ripe for that. Nor does space permit me to repeat all the background information from my other books. For a complete guide to optical configurations and imaging techniques, see *Astrophotography for the Amateur* (1999). To get started with a telescope, see *How to Use a Computerized Telescope* and *Celestial Objects for Modern Telescopes* (both 2002). All these books are published by Cambridge University Press.

What I most want to emphasize is that **DSLR astrophotography can be easy**, easier than any earlier way of photographing the stars. It's easy to lose track of this fact because of the flurry of technical enthusiasm that DSLRs are generating. New techniques and new software tools appear almost daily, and the resulting discussion, in perhaps a dozen online forums, thrills experts and bewilders beginners.

My goal is to save you from bewilderment. You don't have to be a mathematician to get good pictures with a DSLR, just as you didn't have to be a chemist to develop your own film. I'll concentrate on simple, reliable techniques and on helping you understand how DSLR astrophotography works.

The people who contributed pictures are acknowledged in the picture captions. (Pictures not otherwise identified are my own work.) In addition, I want to thank Fred Metzler, of Canon USA, and Bill Pekala, of Nikon USA, for lending me equipment to test; Douglas George, of Diffraction Limited Ltd., for help with software; and all the members of the *Canon DSLR Digital Astro*, *Nikon DSLR Astro*, and *MaxDSLR* forums on YahooGroups (<http://groups.yahoo.com>) for

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useful discussions and information. As always I thank my wife Melody and my daughters Cathy and Sharon for their patience.

If you're a beginner, welcome to astrophotography! And if you're an experienced astrophotographer, I hope you enjoy the new adventure of using DSLRs as much as I have. Please visit this book's Web site, *www.dslrbook.com*, for updates and useful links.

*Athens, Georgia
March 7, 2007*