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Globular cluster Messier 5 in Serpens. Image by Martin Griffiths courtesy of LCOGT

# Choosing and Using Astronomical Filters

Martin Griffiths

 Springer

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*This book is dedicated to:  
Dena, Harry, Yoda and Gloria  
All of them are stars in their own special way...*





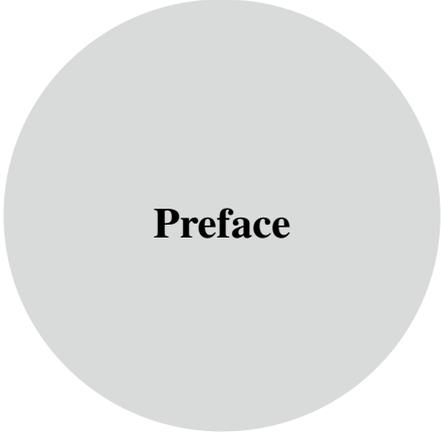
## About the Author

**Martin Griffiths** is an enthusiastic science communicator, writer and professional astronomer. Over his career he has utilized history, astronomy and science fiction as tools to encourage greater public understanding of science. He is a recipient of the Astrobiology Society of Britain's Public Outreach Award (2008) and the Astronomical League's Outreach Master Award (2010). He also holds the League's Master Observer certificate and has written or contributed to over 100 published science articles for many journals. He is currently an astronomer and senior lecturer at the University of South Wales in the UK.

He was one of the founding members of NASA's Astrobiology Institute Science Communication Group, which was active in 2003–2006. He also managed a large ESF program in Astrobiology for adult learners across Wales in 2003–2008. Since then he has been involved in promoting adult education, assisting in the development of a new observational astronomy award at the University of South Wales, and various other projects, including initial consultation on the setup of an educational observatory in Andalucia, Spain, now run by Andy Burns and Kath Griffiths.

He is a consultant to the Welsh Government through his involvement with the Dark Sky Discovery initiative, enabling public access to dark sky sites in association with Dark Sky Wales, Dark Sky Scotland and Natural England. He was also responsible for surveying the sky quality of the Brecon Beacons National Park in their successful bid to gain International Dark Sky Association Dark Sky Reserve status in 2013 and is a consultant to the Hay Tourism Board for their annual dark sky festivals.

Martin is a Fellow of the Royal Astronomical Society; a Fellow of the Higher Education Academy and a member of the Astrobiology Society of Britain; the European Society for the History of Science; the British Astronomical Association; the British Science Association; the Webb Deep-Sky Society; the Society for Popular Astronomy and the Astronomical League. Martin is also a local representative for the BAA Campaign for Dark Skies and lectures in astronomy to anyone who will listen.



## Preface

Taking a quality image of the night sky used to be a daunting task for any photographer and was a valid achievement in its own right. Capturing the beauty of the astronomical objects involved real skills.

In the past, achieving this was always something that engendered pride in the photographer and the admiration of peers. But with the advent of inexpensive digital SLR and CCD cameras, achieving good quality images is now within reach for all astronomers whatever their experience is and is relatively simple to accomplish. And, there are filters that can help them get even better pictures.

Alternatively, there are many amateur astronomers out there who still prefer to observe astronomical objects directly but use filters to enhance their visual acuity and render the objects visible via the medium of sketching. Coloured filters that enhance the visibility of features in planetary atmospheres and surfaces are still commercially available and are regularly offered with some telescopes. “Moon” filters and “solar” filters are still making an impact on new generations of observers who wish to know the sky in as much visual detail as possible.

The manufacturing and supply of filters for astrophotography and visual observing is now a large industry. The purpose of this book is to introduce these filters and give some basic advice on their use and application. This book will serve as a reference point for the observer who wishes to gain experience in CCD or DSLR imaging or in simply looking for faint detail in heavenly objects.

A wealth of material exists on the Internet, from the purchasing of filters through to information on the properties of various astronomical filters. By making these disparate items of information easily accessible in one handy book, the author hopes that the matter conveyed here will be a ready guide to the application and use of filters in visual astronomy and astrophotography.

This work cannot by its very nature as a book keep up with everything available in the market, as new technology or enhancement of current materials goes on continuously. However, it will be a useful source for how to use and properly apply filters to the task at hand. In addition, we have supplied a tempting list of objects to observe or image with such filters. This selection of Astronomical Objects takes into account both the size of the observer's telescope and his or her geographical location, as many Messier objects are included and bright NGC objects across both the Northern and Southern Hemisphere.

The photographs, unless otherwise indicated, were taken by myself.

I hope that you find this book to be a useful addition to your astronomical library.

Glyntaf, United Kingdom  
2014

Martin Griffiths



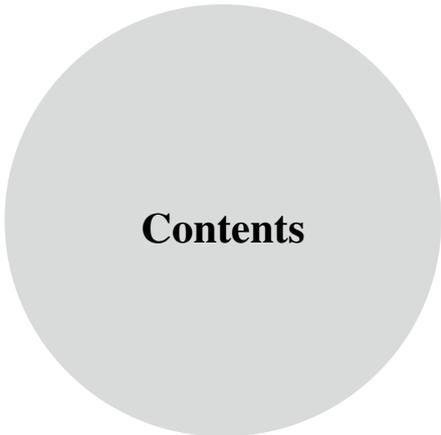
## **Acknowledgements**

When I started observing and photographing the night sky, I never thought that many of the things I had seen and imaged could become the focus of a book. As a professional astronomer who started as an amateur observer, I am aware of the importance of filters in astrophotography and visual work. It was a chance conversation with Dr Mike Inglis at Springer that became the foundation of this book and I thank him for his trust and support.

I would like to thank the Las Cumbres Global Observatory Global Telescope (LCOGT) and the Faulkes telescope team for their assistance and access to the Faulkes telescopes and archive to provide the images, especially Dr Ed Gomez and Professor Paul Roche for their help and credit for the images. I would also like to thank Nick Howes and Andy Burns of the Wiltshire Astronomical Society for their contributions in supplying advice and some of the images. I would also like to thank the editorial staff at Springer for their helpful comments and suggestions.

Unless otherwise acknowledged in the text, all photographs have been taken by the author and are copyright as are the images of the LCOGT and Faulkes telescope archive and those of Nick Howes and Andy Burns.





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