

About the book

When I first started astrophotography it seemed logical to start shooting some of the brightest and easiest to find targets in the northern hemisphere, the Messier objects. Unfortunately I ran into an interesting problem. I had no idea what I was seeing through the telescope, or on the computer screen. Was that an open cluster or was I not even close to my target?

I went looking for a reference to the Messier objects and I found two different types as related to astrophotography. The first had beautiful images, way beyond anything I would be able to create and so was useless at helping me identify, capture and process my own images. The second was too “snapshot” like and equally useless for me. I needed something midrange and try as I might, I just could not find it.

Several years later I started writing my astrophotography books; *Getting Started: Long Exposure Astrophotography* and *Getting Started: Budget Astrophotography* and it dawned on me that other people may be in the exact same place I was. I can fix that.

The purpose of this book is to be a midrange reference to beginning astrophotographers showing them what the targets look like, where they are, to provide some helpful information on capturing specific targets and what a finished image of the target might look like.

I have also included information on how large the target appears in the field of view and the best time of year to capture it. Lastly, I have attempted to put together a schedule someone can use should they want to capture all 110 Messier objects so that they know what targets are in the sky in what order.

Yes, all of this information is readily available from other sources, but it was valuable for me to have something like this all in one place to use for planning as well as in the field and it is my hope that it will be valuable to you in the same way.

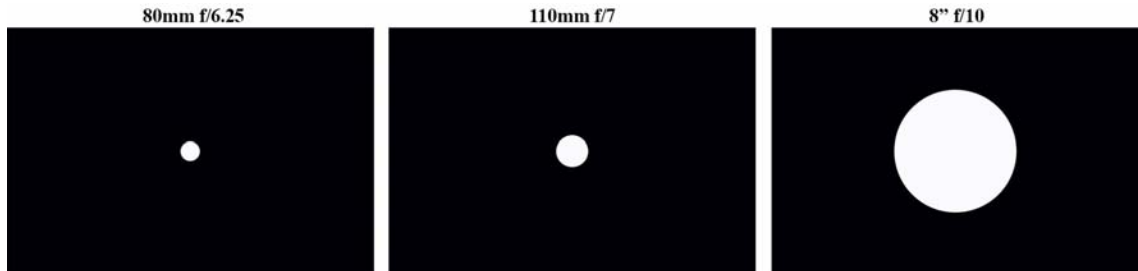
Using this book

For each target you will see a fully processed image of the target followed by a chart running across the page which looks like this:



The area in gray below the months indicates the best time of the year to shoot this particular target from the central US. If you are on the extremes of the east or west coast, you may need to alter your times slightly. I based this off a transit time (transit is the time when it switches from rising to setting) of midnight on the 15th of the month. Earlier months will transit later in the evening, later months transit earlier.

The next thing you will see is the sizing indicators that show approximate sizes of the targets in particular telescopes with a particular camera attached which look like this:



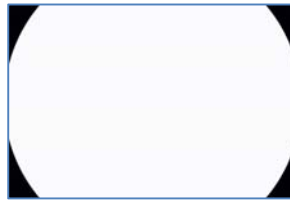
The black rectangles indicate the field of view of an APS-C sized camera sensor (which is roughly the same size as a 25mm eyepiece for reference). I chose the APS-C sensor size as it is the overwhelming choice of beginning astrophotographers.

The round white area is the approximate size the target will appear on your camera sensor, and of course the resultant image without cropping. This is useful both in determining if you are on target correctly and to know what the final image will look like.

I chose the three sizes based off typical astrophotography setups using an 80mm refractor which is extremely common in beginning astrophotography, a 110mm refractor which is

common in midrange astrophotography, and the 8" f10 which is a fairly common SCT purchased primarily for visual being re-tasked for astrophotography.

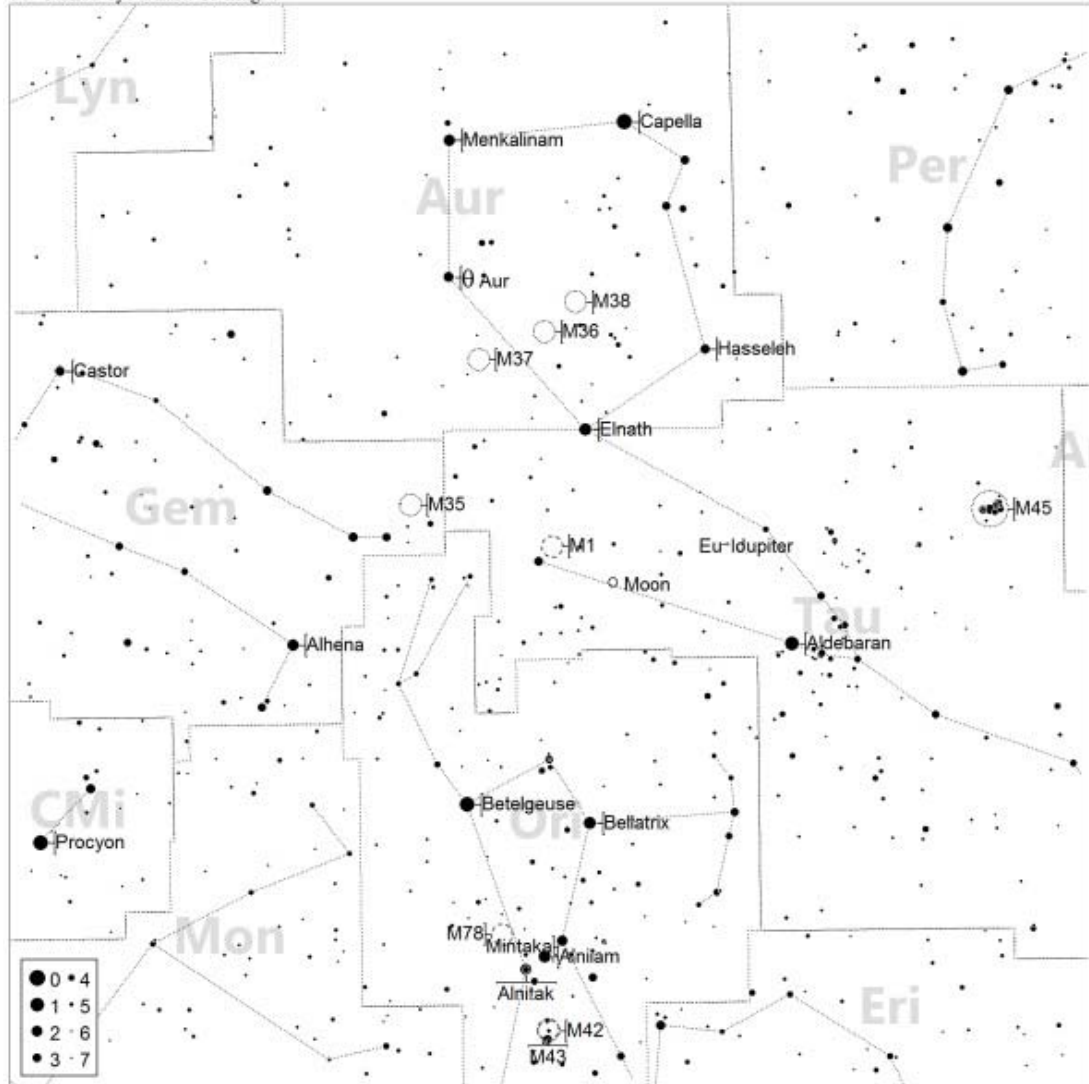
There are targets that fill up or exceed the field of view of the larger telescope, and for this we use the following symbol:



Next will come three sections of text, the first describing the target such as how far away it is, how large it is, how old it is, etc. Second will be the coordinates of the object in right ascension and declination. The third section will contain any notes or tips on how to successfully capture the target.

Lastly, there is a sky chart showing the position of the target in the sky.

60° Naked-eye Chart. To mag: 6



The chart shows the target being discussed directly in the center of the chart, north is up, west is to the right, east to the left, and of course, south is down. Named stars are labeled, and so are other Messier objects in the area. The light gray labels such as Lyn, Aur and Per are constellation abbreviations as shown in the following chart:

And Andromeda	Cru Crux	Oph Ophiuchus
Ant Antlia	Cyg Cygnus	Ori Orion
Aps Apus	Del Delphinus	Pav Pavo
Aqr Aquarius	Dor Dorado	Peg Pegasus
Aql Aquila	Dra Draco	Per Perseus
Ara Ara	Equ Equuleus	Phe Phoenix
Ari Aries	Eri Eridanus	Pic Pictor
Aur Auriga	For Fornax	Psc Pisces
Boo Boötes	Gem Gemini	PsA Piscis Austrinus
Cae Caelum	Gru Grus	Pup Puppis
Cam Camelopardalis	Her Hercules	Pyx Pyxis
Cnc Cancer	Hor Horologium	Ret Reticulum
CVn Canes Venatici	Hya Hydra	Sge Sagitta
CMA Canis Major	Hyi Hydrus	Sgr Sagittarius
CMi Canis Minor	Ind Indus	Sco Scorpius
Cap Capricornus	Lac Lacerta	Scl Sculptor
Car Carina	Leo Leo	Sct Scutum
Cas Cassiopeia	LMi Leo Minor	Ser Serpens
Cen Centaurus	Lep Lepus	Sex Sextans
Cep Cepheus	Lib Libra	Tau Taurus
Cet Cetus	Lup Lupus	Tel Telescopium
Cha Chamaeleon	Lyn Lynx	Tri Triangulum
Cir Circinus	Lyr Lyra	TrA Triangulum Australe
Col Columba	Men Mensa	Tuc Tucana
Com Coma Berenices	Mic Microscopium	UMa Ursa Major
CrA Corona Austrina	Mon Monoceros	UMi Ursa Minor
CrB Corona Borealis	Mus Musca	Vel Vela
Crv Corvus	Nor Norma	Vir Virgo
Crt Crater	Oct Octans	Vol Volans
		Vul Vulpecula

The boxes around the constellations are the constellation boundaries.

Down in the bottom left is a key that shows how a star will be displayed depending on its magnitude. The larger the star is drawn, the brighter it is, and the lower the magnitude number.

These charts are printed from AstroPlanner by iLanga Inc which is available from www.astroplanner.net. If you are at all interested in software planning, observation logging and charting software, you owe it to yourself to take a look at this software. To me it seems to be far and away the best software for the job. When you do visit his site, be sure to

thank the author, Paul Rodman, for being kind enough to allow me to reprint charts made with his fine software.

Objects do not have a “correct” exposure as the exposure needed will vary with the amount of light pollution in the area, sensitivity of your equipment (CCDs are typically more sensitive than a DSLR for example, monochrome is generally more sensitive than color, etc), focal ratio of your telescope (an f5 scope lets in more light than an f8 scope), and more. The exposure information given in this book is a reference or starting point only. If you find that on one target my exposures are far too short, you may need to increase all the exposure numbers in the book to help match your equipment and skies. When I give example exposures, they are for my 110mm f7 APO refractor with my Nikon D7000 camera; modify them accordingly.

Throughout the book you will hear me talk about different methods of processing and specific terms such as levels, curves, white points, black points, layers and more. Unfortunately it is beyond the scope of this book to include detailed processing examples and a huge glossary. For that information you may want to acquire one of my other books such as *Getting Started: Long Exposure Astrophotography* or *Getting Started: Budget Astrophotography*.

There are a few terms you need to understand before getting into the objects:

Core – The central section of an object where it is densest.

Deep – Generally referring to longer exposures as these will capture objects “deeper” in space.

Field – Usually referring to the background but means the entire area of the image.

Spread – The area around the core of a globular cluster, usually much fainter than the core and much less dense.