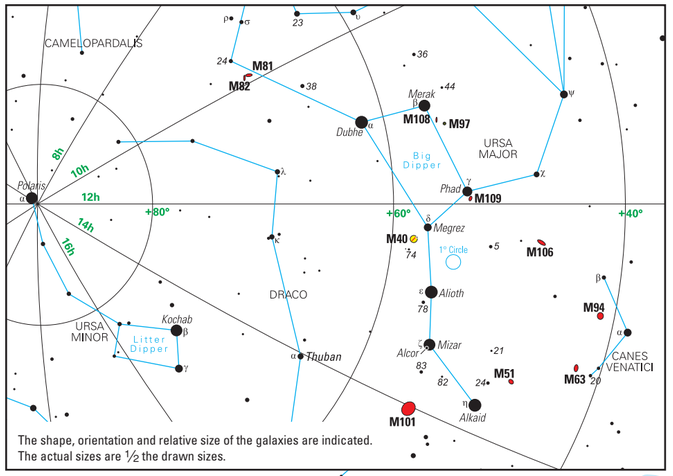
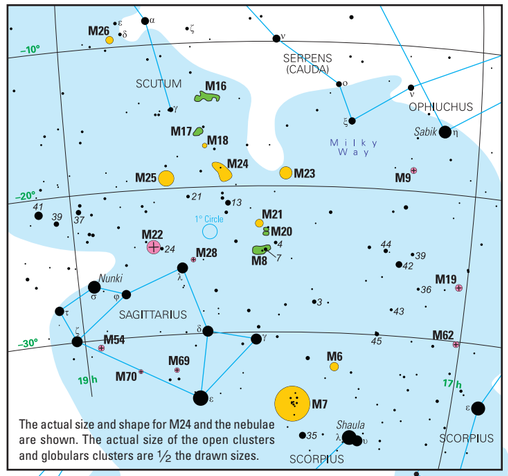


The shape, orientation and relative size of the galaxies are indicated. The actual sizes are ½ the drawn sizes.



The actual size and shape for M24 and the nebulae are shown. The actual size of the open clusters and globulars clusters are ½ the drawn sizes.

Deep Sky Objects (DSOs)

Deep Sky Objects are Open Clusters, Globular Clusters, Planetary Nebulae, Supernova Remnants, Nebulae and Galaxies. *Stars and double stars are not considered deep sky objects.*

An **Open Cluster** is a group of several to hundreds of stars that were born out of the same nebula cloud. A group often forms a pretty pattern. M45, the Pleiades is the best example. These clusters reside in our Milky Way Galaxy. Our Sun is no longer in its group.

Globular Clusters look like fuzzy balls because they contain tens of thousands of stars held together by their mutual gravity. All of the globulars that can be seen in the sky are part of our Milky Way Galaxy and there are about 200 of them that surround our galaxy like a halo. M13 and M22 are favorites.

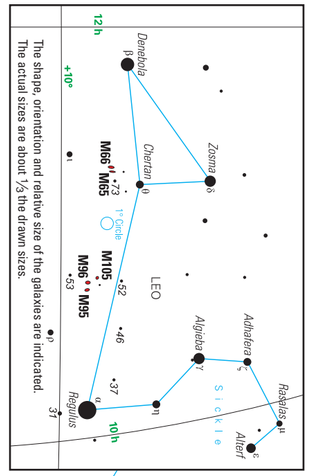
A **Planetary Nebula** is an old term that has nothing to do with the planets. It is a round or symmetrical nebula that is the shed atmosphere of a dying star. At its center is a white dwarf star. When our Sun dies, it will create a planetary nebula. These objects are in our galaxy. The Ring Nebula, M57 is a favorite.

A **Supernova Remnant** is the remaining hydrogen gas from a very large star that has exploded at the end of its life. M1, the Crab Nebula is the only supernova remnant listed in Messier's catalogue.

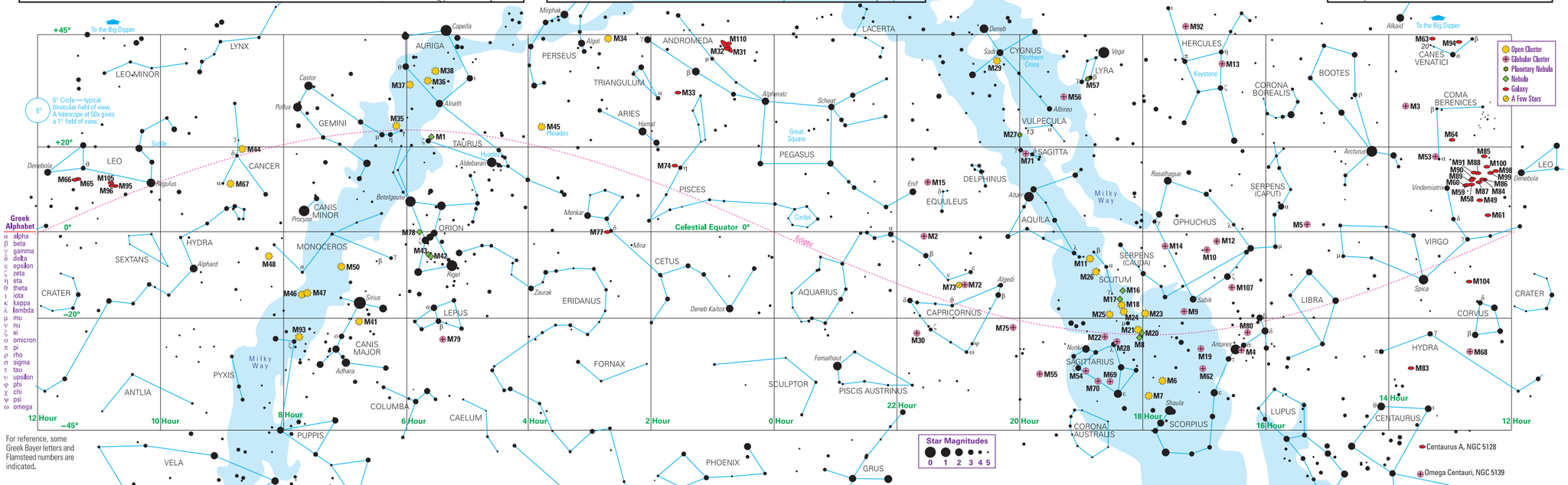
A **Nebula** is a giant hydrogen gas cloud that is in our galaxy and can span 60 light years or more. One light year is about 6 trillion miles. Within these clouds, gas can concentrate to form stars and accompanying planets. A set of stars created by a nebula is known as an Open Cluster. The Orion Nebula, M42 is the favorite. Four stars born in M42 can be seen easily with a small telescope at 50x. They are in the brightest part of the nebula and are known as the Trapezium because they form the shape of a trapezoid. More stars are being born in this nebula.

Galaxies contain billions of stars. All galaxies are beyond our Milky Way Galaxy, where our Sun resides. The Milky Way Band represents the faint glow from the bulk of stars in our galaxy. Remember, our Sun is just one star out of about 200 billion stars in our Milky Way Galaxy. When you are observing a galaxy, you are looking through our galaxy into the true depths of the universe. The Andromeda Galaxy, M31 can be seen with the naked eye.

The first five DSOs described above exist in other galaxies but they are too far away and thus too minute to be viewed in a telescope.



The shape, orientation and relative size of the galaxies are indicated. The actual sizes are about ½ the drawn sizes.



For reference, some Greek Bayer letters and Flamsteed numbers are indicated.

Charles Messier, 1730–1817

Charles Messier was the first astronomer to catalogue deep sky objects. His catalogue of over 100 objects is still popular today because it lists the biggest and brightest — all of which can be seen easily with a small, 3" telescope.

Charles Messier in 1771

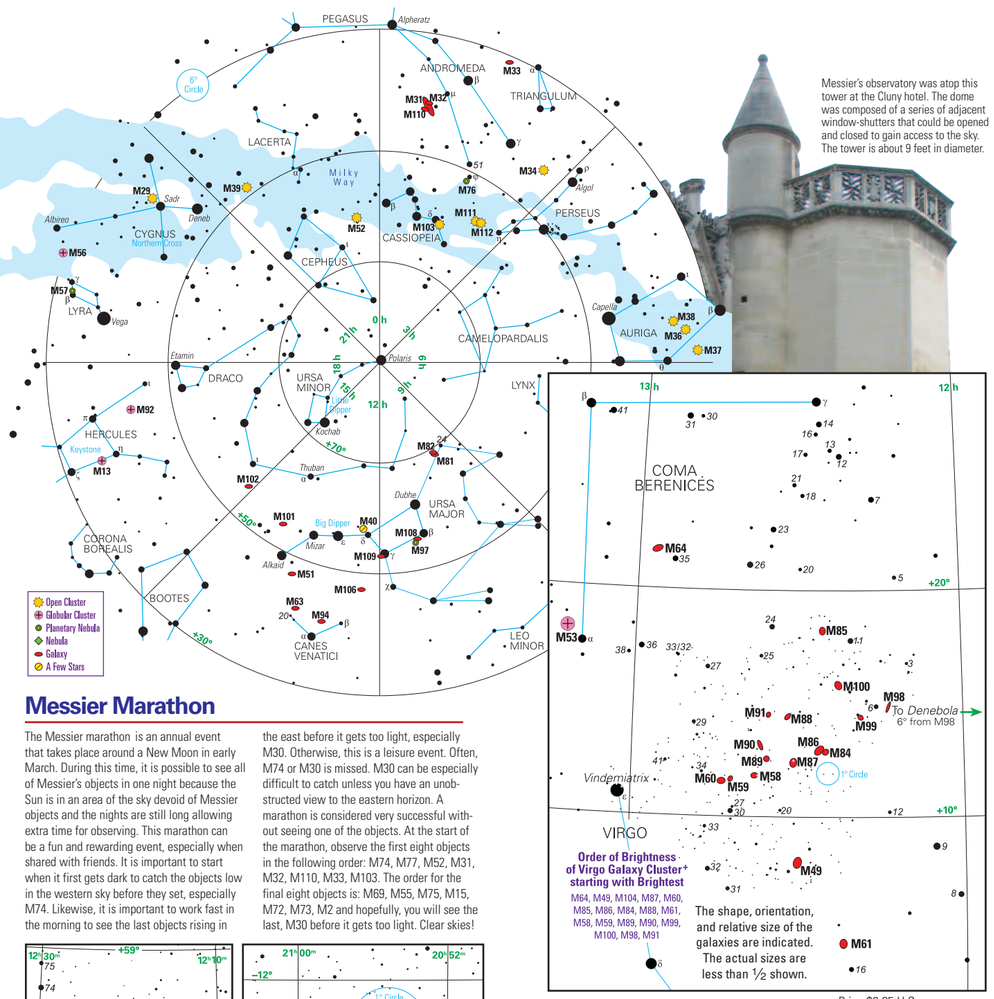
Messier was born in the small town of Badonville, France located 200 miles due east of Paris. His father held a mayoral-type position but unfortunately died when Messier was 11 years old. Afterward, Hyacinthe, his oldest brother, trained Messier as an administrator's assistant. Jobs became scarce in his region of France after a territorial reorganization that began in the late 1740s. Consequentially, Hyacinthe used his influence and found Messier a job in Paris as an assistant to an astronomer solely because it seemed the more advantageous of two positions.

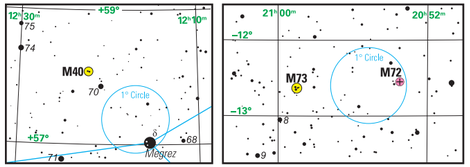
In 1751, at the age of 21, Messier left for Paris to work for the aristocrat and professor of astronomy, Joseph Delisle. He first drew maps but soon assumed astronomical duties including the search for the return of Halley's Comet. Messier proved himself time after time in his abilities to observe, document and follow through on assignments. His work relationship changed in 1758 when Messier found his first comet, and shortly afterwards more, an accomplishment held in high esteem at the time.

Although Messier is well-remembered for discovering 20 comets, he is best characterized as the *leading observational astronomer* during the late 1700s. He was elected into 17 science academies throughout Europe and published over 100 observations, spanning the gamut of astronomy, in leading scientific circulars. Messier eventually assumed the position and title of his boss, Astronomer of the Navy.

Messier compiled his catalogue of deep sky objects as *a reference work — a catalogue that was lacking in the field of astronomy*. He started in 1758 and added the last object in 1784. Three catalogues were published, each growing in size. In 1774, Messier met Pierre Méchan who became a good friend and helped him catalogue objects M63 and higher. Messier did not put an "M" in front of his catalogue numbers.

"Hotel Cluny," as it stands today in Paris, off the north end of the Sorbonne in the Latin Quarter. Messier had his observatory atop the tower to the right of the light pole. He also lived here when he became Astronomer of the Navy. This building is now a Middle Ages museum, the Musée National du Moyen Âge et Thermes de Cluny.





Messier Marathon

The Messier marathon is an annual event that takes place around a New Moon in early March. During this time, it is possible to see all of Messier's objects in one night because the Sun is in an area of the sky devoid of Messier objects and the nights are still long allowing extra time for observing. This marathon can be a fun and rewarding event, especially when shared with friends. It is important to start when it first gets dark to catch the objects low in the western sky before they set, especially M74. Likewise, it is important to work fast in the morning to see the last objects rising in the east before it gets too light, especially M30. Otherwise, this is a leisure event. Often, M74 or M30 is missed. M30 can be especially difficult to catch unless you have an unobstructed view to the eastern horizon. A marathon is considered very successful without seeing one of the objects. At the start of the marathon, observe the first eight objects in the following order: M74, M77, M52, M31, M32, M110, M33, M103. The order for the final eight objects is: M69, M55, M75, M15, M72, M73, M2 and hopefully, you will see the last, M30 before it gets too light. Clear skies!

Published by Ken Press
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(520) 743-3200 / kenpress.com / office@kenpress.com
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PRINTED IN CANADA

Price $9.95 U.S.

ISBN 1-928771-67-X
ISBN 13: 978-1928771-67-8

Messier's observatory was atop this tower at the Cluny hotel. The dome was composed of a series of adjacent window-shutters that could be opened and closed to gain access to the sky. The tower is about 9 feet in diameter.

Messier's Objects

#	RA	Dec	Const.	Object	Mag.	Arc Size	Name
	YEAR 2000 COORDINATES						
M1	5h 34.5m	+22° 01′	Tau	Supernova Remnant	8	6′ x 4′	Crab Nebula
M2	21h 33.5m	−0° 49′	Aqr	Globular Cluster	6.5	13′	
M3	13h 42.2m	+28° 23′	CVn	Globular Cluster	6.2	16′	
M4	16h 23.6m	−26° 32′	Sco	Globular Cluster	5.9	26′	Cat's Eye
M5	15h 18.6m	+2° 05′	Ser	Globular Cluster	5.7	17′	
M6	17h 40.1m	−32° 13′	Sco	Open Cluster	4.2	15′	Butterfly Cluster
M7	17h 53.9m	−34° 49′	Sco	Open Cluster	3.3	80′	
M8	18h 03.8m	−24° 23′	Sgr	Nebula	6	90′ x 40′	Lagoon Nebula
M9	17h 19.2m	−18° 31′	Oph	Globular Cluster	7.7	9′	
M10	16h 57.1m	−4° 06′	Oph	Globular Cluster	6.6	15′	
M11	18h 51.1m	−6° 16′	Sct	Open Cluster	5.8	14′	Wild Duck Cluster
M12	16h 47.2m	−1° 57′	Oph	Globular Cluster	6.7	15′	
M13	16h 41.7m	+36° 28′	Her	Globular Cluster	5.8	17′	Great Hercules Cluster
M14	17h 37.6m	−3° 15′	Oph	Globular Cluster	7.6	12′	
M15	21h 30.0m	+12° 10′	Peg	Globular Cluster	6.2	12′	Great Pegasus Cluster
M16	18h 18.8m	−13° 47′	Ser	Nebula/Open Cluster	6	35′+/ 7′	Eagle Nebula
M17	18h 20.8m	−16° 11′	Sgr	Nebula/Open Cluster	7	46′ x 37′	Omega Nebula
M18	18h 19.9m	−17° 08′	Sgr	Open Cluster	6.9	9′	Black Swan
M19	17h 02.6m	−26° 16′	Oph	Globular Cluster	6.8	14′	
M20	18h 02.6m	−23° 02′	Sgr	Nebula/Open Cluster	8	28′x28′/28′	Trifid Nebula
M21	18h 04.6m	−22° 30′	Sgr	Open Cluster	5.9	13′	
M22	18h 36.4m	−23° 54′	Sgr	Globular Cluster	5.1	24′	Great Sagittarius Cluster
M23	17h 56.8m	−19° 01′	Sgr	Open Cluster	5.5	27′	
M24	18h 16.9m	−18° 29′	Sgr	Thick Milky Way Patch	4	90′ x 60′	
M25	18h 31.6m	−19° 15′	Sgr	Open Cluster	4.6	32′	
M26	18h 45.2m	−9° 24′	Sct	Open Cluster	8.0	15′	
M27	19h 59.6m	+22° 43′	Vul	Planetary Nebula	8	8′ x 4′	Dumbbell Nebula
M28	18h 24.5m	−24° 52′	Sgr	Globular Cluster	6.8	11′	
M29	20h 23.9m	+38° 32′	Cyg	Open Cluster	6.6	7′	
M30	21h 40.4m	−23° 11′	Cap	Globular Cluster	7.2	11′	
M31	0h 42.7m	+41° 16′	And	Spiral Galaxy	3.5	178′ x 63′	Andromeda Galaxy
M32	0h 42.7m	+40° 52′	And	Elliptical Galaxy	8.2	8′ x 6′	
M33	1h 33.9m	+30° 39′	Tri	Spiral Galaxy	5.7	62′ x 39′	Pinwheel Galaxy
M34	2h 42.0m	+42° 47′	Per	Open Cluster	5.2	35′	
M35	6h 08.9m	+24° 20′	Gem	Open Cluster	5.1	28′	
M36	5h 36.1m	+34° 08′	Aur	Open Cluster	6.0	12′	
M37	5h 52.4m	+32° 33′	Aur	Open Cluster	5.6	24′	
M38	5h 28.7m	+35° 50′	Aur	Open Cluster	6.4	21′	
M39	21h 32.2m	+48° 26′	Cyg	Open Cluster	4.6	32′	
M40	12h 22.4m	+58° 05′	UMa	Double Star	9.6/10.1	1″	
M41	6h 46.0m	−20° 44′	CMa	Open Cluster	4.5	38′	Little Beehive
M42	5h 35.4m	−5° 27′	Ori	Nebula	4	66′ x 60′	The Great Orion Nebula
M43	5h 35.6m	−5° 16′	Ori	Nebula	9	20′ x 15′	
M44	8h 40.1m	+19° 59′	Cnc	Open Cluster	3.1	95′	Praesepe
M45	3h 47.0m	+24° 07′	Tau	Open Cluster	1.2	110′	Pleiades
M46	7h 41.8m	−14° 49′	Pup	Open Cluster	6.1	27′	
M47	7h 36.6m	−14° 30′	Pup	Open Cluster	4.4	30′	
M48	8h 13.8m	−5° 48′	Hya	Open Cluster	5.8	54′	
M49	12h 29.8m	+8° 00′	Vir	Elliptical Galaxy	8.4	9′ x 7′	
M50	7h 02.8m	−8° 23′	Mon	Open Cluster	5.9	16′	
M51	13h 29.9m	+47° 12′	CVn	Spiral Galaxy	8.1	11′ x 8′	Whirlpool Galaxy
M52	23h 24.2m	+61° 35′	Cas	Open Cluster	6.9	13′	The Scorpion
M53	13h 12.9m	+18° 10′	Com	Globular Cluster	7.6	13′	
M54	18h 55.1m	−30° 29′	Sgr	Globular Cluster	7.6	9′	
M55	19h 40.0m	−30° 58′	Sgr	Globular Cluster	7.0	19′	The Spectre
M56	19h 16.6m	+30° 11′	Lyr	Globular Cluster	8.3	7′	
M57	18h 53.6m	+33° 02′	Lyr	Planetary Nebula	9	1.3′	Ring Nebula
M58	12h 37.7m	+11° 49′	Vir	Spiral Galaxy	9.8	5′ x 4′	
M59	12h 42.0m	+11° 39′	Vir	Elliptical Galaxy	9.8	5′ x 3′	
M60	12h 43.7m	+11° 33′	Vir	Elliptical Galaxy	8.8	7′ x 6′	
M61	12h 21.9m	+4° 28′	Vir	Elliptical Galaxy	9.7	6′ x 5′	Swelling Spiral
M62	17h 01.2m	−30° 07′	Oph	Globular Cluster	6.5	14′	Flickering Globular
M63	13h 15.8m	+42° 02′	CVn	Spiral Galaxy	8.6	12′ x 8′	Sunflower Galaxy
M64	12h 56.7m	+21° 41′	Com	Spiral Galaxy	8.5	9′ x 5′	Black Eye Galaxy
M65	11h 18.9m	+13° 05′	Leo	Spiral Galaxy	9.3	10′ x 3′	
M66	11h 20.2m	+12° 59′	Leo	Spiral Galaxy	9.0	9′ x 4′	
M67	8h 51.4m	+11° 49′	Cnc	Open Cluster	6.9	30′	King Cobra
M68	12h 39.5m	−26° 45′	Hya	Globular Cluster	8.2	12′	
M69	18h 31.4m	−32° 21′	Sgr	Globular Cluster	7.6	7′	
M70	18h 43.2m	−32° 18′	Sgr	Globular Cluster	8.1	8′	
M71	19h 53.8m	+18° 47′	Sge	Globular Cluster	8.2	7′	
M72	20h 53.5m	−12° 32′	Aqr	Globular Cluster	9.3	6′	
M73	20h 58.9m	−12° 38′	Aqr	4-Star △ Asterism	10.5–Brightest	1′	
M74	1h 36.7m	+15° 47′	Psc	Spiral Galaxy	9.2	10′ x 9′	The Phantom
M75	20h 06.1m	−21° 55′	Sgr	Globular Cluster	8.5	6′	
M76	1h 42.4m	+51° 34′	Per	Planetary Nebula	11	2′ x 1′	Little Dumbbell
M77	2h 42.7m	−0° 01′	Cet	Spiral Galaxy	8.8	7′ x 6′	
M78	5h 46.7m	+0° 03′	Ori	Nebula	8	8′ x 6′	
M79	5h 24.5m	−24° 33′	Lep	Globular Cluster	7.7	9′	
M80	16h 17.0m	−22° 59′	Sco	Globular Cluster	7.3	9′	
M81	9h 55.6m	+69° 04′	UMa	Spiral Galaxy	6.8	26′ x 14′	
M82	9h 55.8m	+69° 41′	UMa	Irregular Galaxy	8.4	11′ x 5′	Cigar Galaxy
M83	13h 37.0m	−29° 52′	Hya	Spiral Galaxy	8	11′ x 10′	
M84	12h 25.1m	+12° 53′	Vir	Elliptical Galaxy	9.3	5′ x 4′	
M85	12h 25.4m	+18° 11′	Com	Elliptical Galaxy	9.2	7′ x 5′	
M86	12h 26.2m	+12° 57′	Vir	Elliptical Galaxy	9.2	7′ x 5′	
M87	12h 30.8m	+12° 24′	Vir	Elliptical Galaxy	8.6	7′	Virgo A
M88	12h 32.0m	+14° 25′	Com	Spiral Galaxy	9.5	7′ x 4′	
M89	12h 35.7m	+12° 33′	Vir	Elliptical Galaxy	9.8	4′	
M90	12h 36.8m	+13° 10′	Vir	Spiral Galaxy	9.5	10′ x 5	
M91	12h 35.4m	+14° 30′	Com	Spiral Galaxy	10.2	5′ x 4′	
M92	17h 17.1m	+43° 08′	Her	Globular Cluster	6.4	11′	
M93	7h 44.6m	−23° 52′	Pup	Open Cluster	6	22′	
M94	12h 50.9m	+41° 07′	CVn	Spiral Galaxy	8.1	11′ x 9′	Croc's Eye
M95	10h 44.0m	+11° 42′	Leo	Spiral Galaxy	9.7	7′ x 5′	
M96	10h 46.8m	+11° 49′	Leo	Spiral Galaxy	9.2	7′ x 5′	
M97	11h 14.8m	+55° 01′	UMa	Planetary Nebula	11	3′	Owl Nebula
M98	12h 13.8m	+14° 54′	Com	Spiral Galaxy	10.1	10′ x 3′	
M99	12h 18.8m	+14° 25′	Com	Spiral Galaxy	9.8	5′	
M100	12h 22.9m	+15° 49′	Com	Spiral Galaxy	9.4	7′ x 6′	The Mirror
M101	14h 03.2m	+54° 21′	UMa	Spiral Galaxy	7.7	27′ x 26′	Pinwheel Galaxy
M102	15h 06.5m	+55° 46′	Dra	Elliptical Galaxy	9.9	6′ x 3′	Méchain's Lost Galaxy
M103	1h 33.2m	+60° 42′	Cas	Open Cluster	7	6′	
M104	12h 40.0m	−11° 37′	Vir	Spiral Galaxy	8.3	9′ x 4′	Sombrero Galaxy
M105	10h 47.8m	+12° 35′	Leo	Elliptical Galaxy	9.3	5′ x 4′	
M106	12h 19.0m	+47° 18′	CVn	Spiral Galaxy	8.3	18′ x 8′	
M107	16h 32.5m	−13° 03′	Oph	Globular Cluster	8.1	10′	
M108	11h 11.5m	+55° 40′	UMa	Spiral Galaxy	10.0	8′ x 2′	
M109	11h 57.6m	+53° 23′	UMa	Spiral Galaxy	9.8	8′ x 5′	
M110	0h 40.4m	+41° 41′	And	Elliptical Galaxy	8.0	17′ x 10′	
M111	2h 19.0m	+57° 09′	Per	Open Cluster	4.5	30′	West Part of Double Cluster
M112	2h 22.4m	+57° 07′	Per	Open Cluster	4.5	30′	East Part of Double Cluster

This proven artwork under the list of objects is Messier's colophon he drew on a personal copy of his printed catalogue.

Observing Notes. All of the Messier objects can be seen easily with a 3-inch diameter telescope in dark skies using magnifications from 25x–60x. Light polluted skies and a bright Moon will make some objects impossible to see. M1 disappears easily in light pollution. M24 is a large, thick and brighter patch of the Milky Way Band and is best observed using lower magnifications of around 30x. M29 is not very distinct because it blends in with the Milky Way. M32 appears separate and detached from the core of M31, the Andromeda Galaxy. M110 is much fainter than M32 and is almost on the opposite side of M31 from M32. M33/M101 are very large, face-on galaxies and thus have very low surface brightness. View with low power in dark skies. M40 is just two stars and is a report of a negative find by Messier from a short list of objects compiled by another astronomer. If you are looking at M42, you are also seeing M43, for it is the round knot "attached" to the flat side of the nebula — see picture on cover. M73 is a triangle of 4 faint stars and is the only mistake made by Messier — he thought it had nebulosity. M74 is probably the hardest object to see, but it is "easy" under a dark sky. M97 quickly disappears in light-polluted skies. Méchain description of M102 matches NGC 5866 but he could not verify its existence. M111/M112 were not included in Messier's catalogue and are honorary entries — he probably knew of them.

Cover photos. Middle: Medallion of Messier on his birth house. Bottom, *l to r:* Upper: M57, M22. Lower: M43/42, M45, M1, M32/M31/M110

Field Guide

Finding and Viewing

MESSIER'S OBJECTS