Binocular Universe:

Messier Madness

March 2014

Phil Harrington

Baseball can have the World's Series, football can have the Super Bowl, and hockey can have its Stanley Cup. We observers have a full-blown marathon, and its running this month!

"Wait a minute," you say. "Astronomy is a *sport*?!" Well, no, not exactly. Astronomy is far more cerebral than that. Stargazing is a tranquil experience, one that allows the observer to leave Earth and its cares behind, and escape into the beauty of the universe. But every now and then, wouldn't it fun to turn the tables on our hobby and approach from a different perspective?

That is, in part anyway, the idea behind the Messier Marathon. For many of us, observing all of the entries in the famous Messier catalog of deep-sky objects is considered a rite of passage. Completing the list, which may take two or more years, signals that an observer has acquired a respectable knowledge of the sky as well as the art of observing. How quickly an observer completes the task doesn't matter, especially since some of the objects can be tough! In fact, many astronomical societies, including the Astronomical League, issue achievement certificates to all who complete the list.

But this begs the question: how *quickly* can all of the Messier objects be seen? Would it take a year, six months, or maybe even less? The answer is just about 12 hours! Each year right around the Vernal Equinox, the heavens align in such a way that all but one of the Messier objects are visible sometime between sunset and sunrise. That's when we can "run" the Messier Marathon.

Messier Marathoning is a popular rite of late winter/early spring, with many clubs hosting marathons among their members. They work their telescopes diligently across the sky in quest of their prey.

But how about doing the Messier Marathon with binoculars? Some doubters might question that decision, but the fact is that most of the Messier objects can be seen through surprisingly small binoculars. So, this month, I'd like to tempt each of you reading this to try a Messier "Bino-thon.

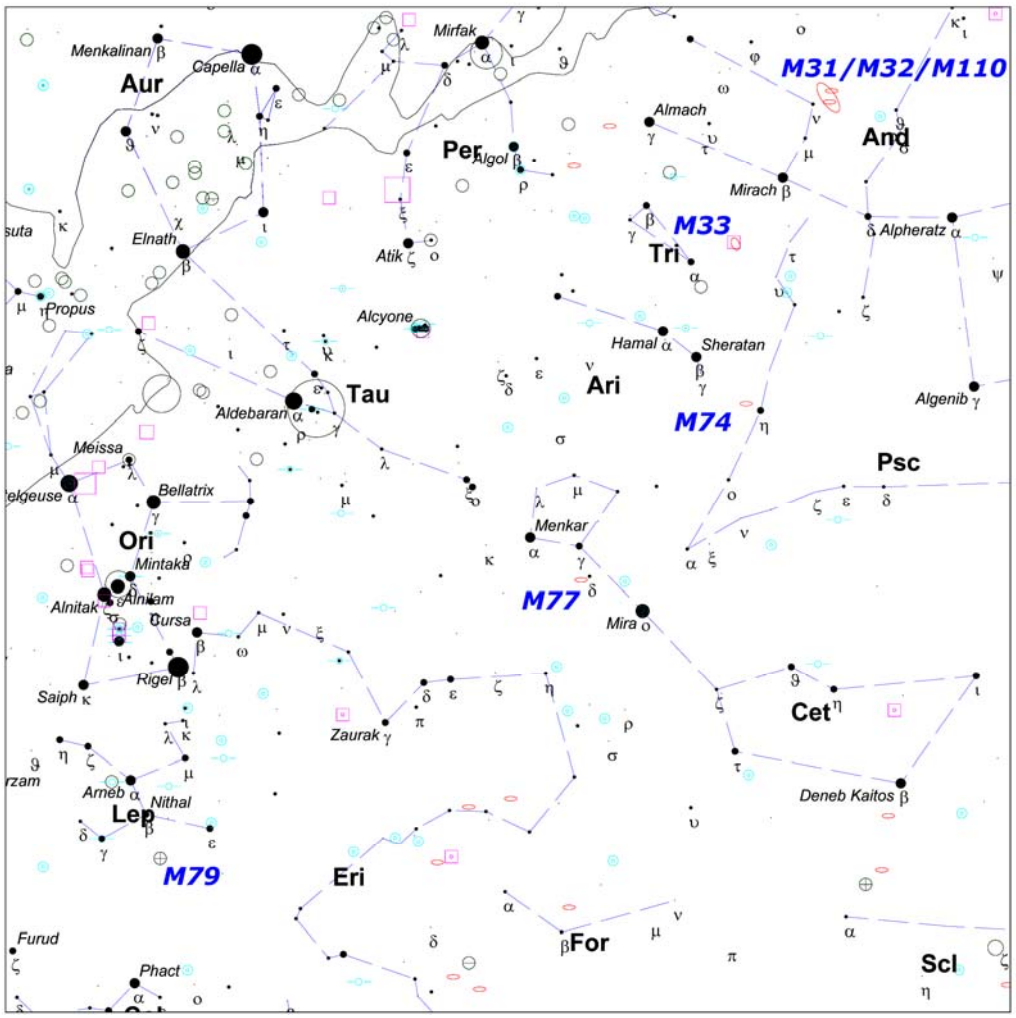
Before we can begin, I'd strongly recommend that you secure your binoculars -- even image-stabilized models -- on some sort of support, such as a suitable tripod. Maintaining the binoculars' aim while going back and forth between eyepieces and charts will make your life much easier.

It's also essential that you enter the marathon with a strategy. First and foremost, you need a finding sequence. Which object do you look at first? What's up next? And which have already been seen? That's why you should print the checklist at the end of this article and bring it with you. The checklist acts as a strategy, a battle plan, and is based on the order that I have used for years.

First, a little explanation. Those objects in **bold-face font** are bright enough to be visible through 50-mm binoculars. Admittedly, some may require a good amount of effort to be seen, but they will eventually show themselves if you persevere. You'll probably need at least a 4-inch telescope to see the rest.

The four objects shaded in blue are bright enough to be seen during evening twilight before the sky darkens completely. They should be your first, to "get them out of the way."

Those objects shown in green are "rush-hour" objects that must be seen either immediately after evening twilight or just before morning twilight. They're the toughest, since each is time-critical.



Above. The Messier Marathon's evening rush hour objects.

Among the most difficult Messier objects to find during the marathon are the seven that set shortly after the Sun and plotted on the chart above. Two, M74 in Pisces and M77 in Cetus, are beyond the grasp of most binoculars even when they are high in the sky, so we'll pass on them. Of the other four, M31, the Andromeda Galaxy, is an easy catch on dark autumn and winter nights. Now, however, Andromeda hovers low in the northwest and you'll need a clear view to spot it. But if you succeed, don't forget about its two galactic companions, M32 and M110. I saw all three through 16x70 binoculars during a recent, cloud-shortened bino-thon, but only caught M31 through my 10x50s.

If you find M31, then M33 in Triangulum may also be possible. I nabbed it through my 16x70s during a marathon one year, but because of the twilight glow, have always missed it with my 10x50s.

The last critical evening target is the globular cluster M79 in Lepus. To locate it, extend a line from Alpha through Beta Leporis an equal distance to the south to a lone 5th-magnitude star. M79 is just 1/2° to that star's east. Don't be discouraged if you miss, however. It's tough.

Many early evening Messier objects, such as M42 and M45 (the Pleiades), are easy to spot, but there are others that will really test your skills. One that immediately comes to mind is number 1 on the list, M1, the famous Crab Nebula in Taurus. I can still remember the cold January night back in high school when I first spotted the Crab through my old 7x35s. I was out in my backyard, lying in a snow bank and scanning the winter stars. I thought it might be fun to see how many Messier objects I could see and figured it was appropriate to start at the beginning. I didn't expect it, but sure enough, M1 was there! You can see it too if you look just to the northwest of Zeta Tauri.

Finally, there are three striking Messier open clusters in the vast starless void east of Sirius. All are bright, but finding them can be tough because of the sparse surroundings.

Head east of Sirius to the star Gamma Canis Majoris. Continue eastward, past a triangle of faint stars, to a second slender triangle. That second triangle frames M46 and M47. The western cluster, M47, looks like a hazy blotch peppered with several pinpoints of light. The cluster itself is quite pretty, especially when combined with its starry surroundings.

M46 is just east of M47. Unlike its neighbor, which has several stars within the grasp of most binoculars, M46 is a rich congregation of very faint stars. Most binoculars only show a hazy glow, maybe with just a few very faint specks within.

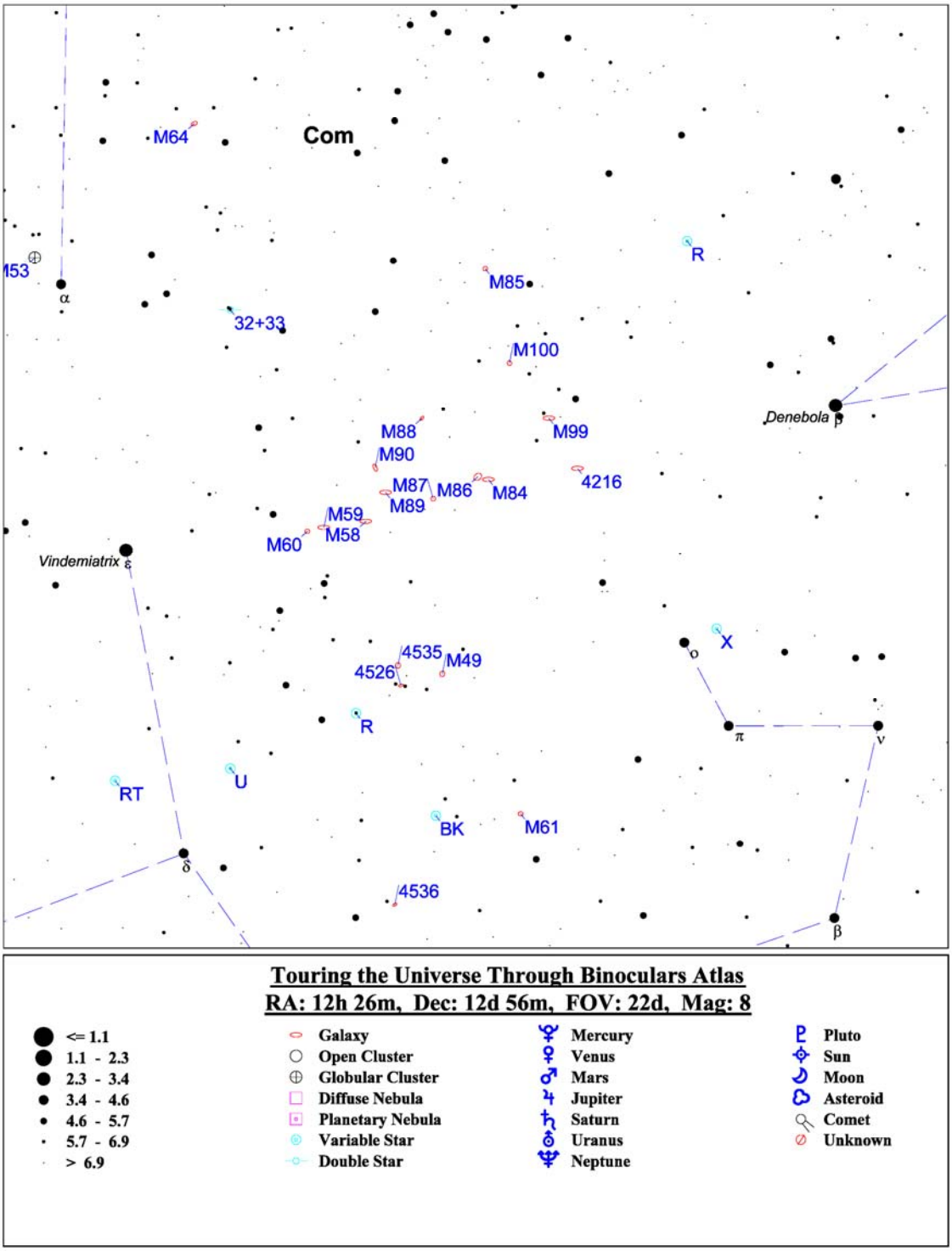
Once you find M46 and M47, slide southward a little more than a field's width to M93. Look for it just above a crooked rectangle of four stars, including Xi Puppis. I can see about half a dozen stars mixed throughout a dim glow that, to my eyes, looks triangular.

Before midnight, the stars of spring are replacing those of winter, bringing with them a cadre of new Messier challenges.

Somewhere around 1:00 a.m., you hit the marathon's "heartbreak hill": the Coma-Virgo Realm of Galaxies. The Realm of Galaxies contains no fewer than 14 Messier objects within a 45-square-degree area. Nowhere in the entire sky are so many Messier objects packed into such a small region as here. How many can *you* find through binoculars?

The key is not to panic. To make it up this climb, you will need a detailed chart of the area. The chart below was created using my Touring the Universe through Binoculars Atlas (TUBA) freeware, which you can download from http://www.philharrington.net/tuba.htm

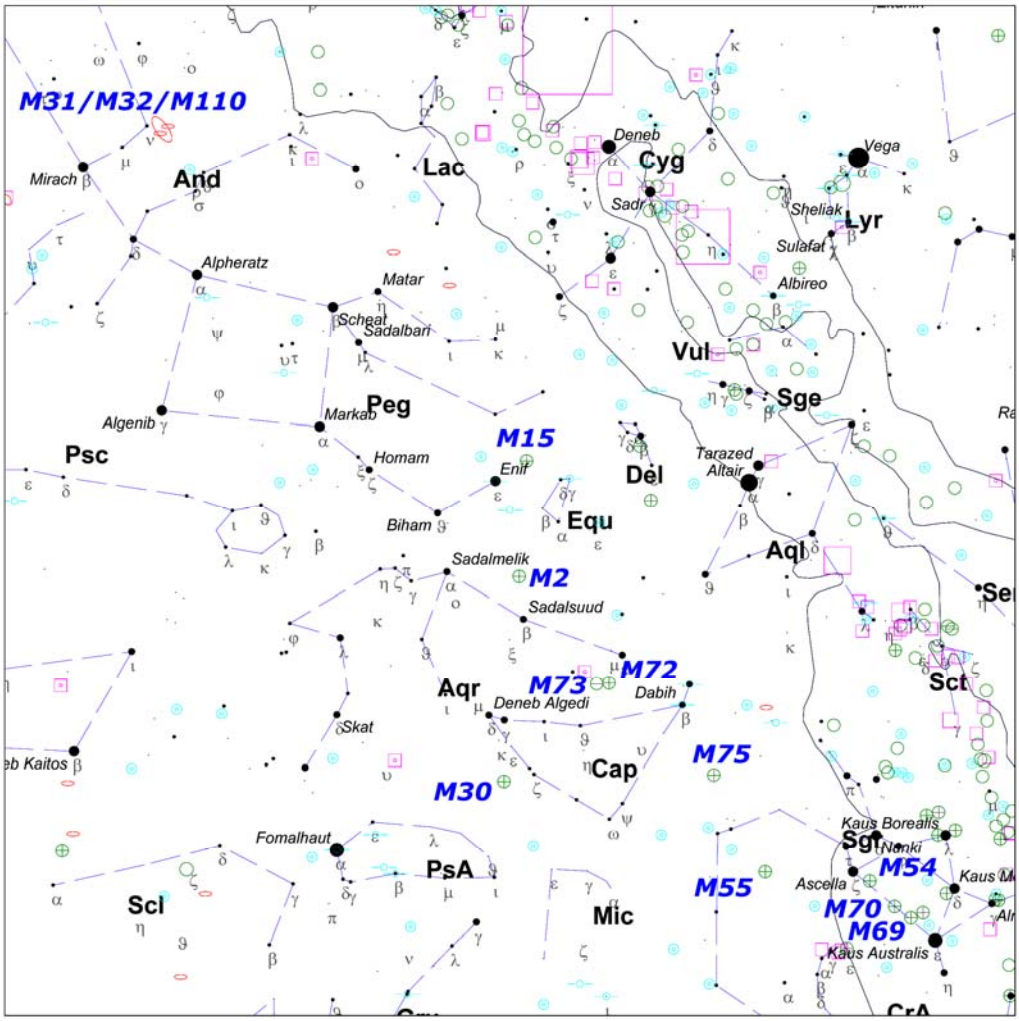
With it, you can create your own customized version, specifying field size, magnitude limits, and so on.



Above. The Coma-Virgo Realm of Galaxies showing the members visible through typical binoculars.

After the Realm is conquered, you can breathe a sigh of relief. The hard part is over! The time is now perhaps 2:00 a.m., and although the air is cold, the stars of summer are rising in the east, bringing with them such wonderful deep-sky treasures as M8, M11, M13, M17, and M22. It feels good to see these summer sights again, although the visit to each will be necessarily brief, for within two hours, dawn's first light will begin to appear, eventually stealing back the night. Work your way from north to south along the Milky Way.

Entering Sagittarius, the time is now close to 3:30 a.m. The Marathon is now entering the home stretch. Objects in Scorpius and western Sagittarius are well up in the southeastern sky, and so should present little problem unless blocked by some terrestrial obstacle.



Above. The Messier Marathon's morning rush hour objects.

Those found in southern and eastern Sagittarius, however, are bigger problems. Pause quickly at the challenging globular clusters M54, M69, and M70 along the bottom of the Sagittarius teapot, then hurry toward M55 and M75 in the constellation's eastern quadrant. Finally, race into Aquarius for M2 and then northward to M15 in Pegasus.

With birds chirping to herald the coming dawn, try your best for M72 and M73. First, the dimmest glow of the 9th-magnitude globular M72 comes into view. Finally, grapple for the

four faint stars that make up M73, one of the least impressive Messier objects. Can M72 and M73 even be seen through binoculars in the growing morning twilight?

Unless you live south of about 35° north latitude, the only Messier object that will escape during the marathon no matter how much you try is M30, a faint globular in Capricornus. For observers to the south, however, there is a chance that it will be visible before dawn becomes too bright. To those industrious observers who also find M30, I tip my hat.

This year, we have two New Moon weekends in March, the first and the last. There are pros and cons to both. The latter is better, since it's closest to the Equinox. It will also push the M31 complex into the morning sky, rising in the northeast just before dawn. But the first weekend in March will keep the evening rush hour objects higher in the sky and make them more accessible. Why not try both?

There isn't anything in the world of amateur astronomy quite like the Messier Marathon. Sure, there are skeptics who frown upon our marathon, saying that racing around like a maniac for a whole night doesn't prove anything. But I beg to differ. The Messier Marathon does prove something very important. It proves that astronomy is fun.

Okay, the race is on! Good luck. And be sure to share your results in this column's discussion forum.

Until next month, remember, that two eyes are better than one.

About the Author:

Phil Harrington has written 9 books for amateur astronomers, including his latest, Cosmic Challenge. Be sure to visit his web site at www.philharrington.net for more information.

Messier Bino-thon Finding Sequence Checklist

Date: _____

Location:_____

☑	Seq#	M	Const.	Type of object	R.A.	Dec	Magnitude	Size (arc-minutes)
	1	**M45**	**Tau**	**Open cluster**	**03 47.0**	**+24 07**	**1.2**	**110**
	2	**M42**	**Ori**	**Bright nebula**	**05 35.4**	**-05 27**	**2.9**	**66x60**
	3	**M43**	**Ori**	**Bright nebula**	**05 35.6**	**-05 16**	**6.9**	**20x15**
	4	**M41**	**CMa**	**Open cluster**	**06 47.0**	**-20 44**	**4.6**	**38**
	5	**M35**	**Gem**	**Open cluster**	**06 08.9**	**+24 20**	**5.3**	**28**
	6	**M31**	**And**	**Galaxy**	**00 42.7**	**+41 16**	**4.8**	**160x40**
	7	M32	And	Galaxy	00 42.7	+40 52	8.7	3x3
	8	M110	And	Galaxy	00 40.4	+41 41	9.4	8x3
	9	M77	Cet	Galaxy	02 42.7	-00 01	8.9	6x5
	10	**M33**	**Tri**	**Galaxy**	**01 33.9**	**+30 39**	**6.3**	**60x35**
	11	**M79**	**Lep**	**Globular cluster**	**05 24.5**	**-24 33**	**8.4**	**3**
	12	M74	Psc	Galaxy	01 36.7	+15 47	9.2	9x9
	13	M76	Per	Planetary nebula	01 42.4	+51 34	12.2	140x70
	14	**M52**	**Cas**	**Open cluster**	**23 24.2**	**+61 35**	**6.9**	**13**
	15	**M103**	**Cas**	**Open cluster**	**01 33.2**	**+60 42**	**7.4**	**5**
	16	**M34**	**Per**	**Open cluster**	**02 42.0**	**+42 47**	**5.5**	**35**
	17	**M38**	**Aur**	**Open cluster**	**05 28.7**	**+35 50**	**6.4**	**21**
	18	**M36**	**Aur**	**Open cluster**	**05 36.1**	**+34 08**	**6.0**	**12**

☑	Seq#	M	Const.	Type of object	R.A.	Dec	Magnitude	Size (arc-minutes)
	19	**M37**	**Aur**	**Open cluster**	**05 52.4**	**+32 33**	**5.6**	**24**
	20	**M1**	**Tau**	**Supernova remnant**	**05 34.5**	**+22 01**	**8.2**	**6x4**
	21	**M78**	**Ori**	**Bright nebula**	**05 46.7**	**+00 03**	**10.5**	**8x6**
	22	**M50**	**Mon**	**Open cluster**	**07 03.2**	**-08 20**	**5.9**	**10x6**
	23	**M47**	**Pup**	**Open cluster**	**07 36.6**	**-14 30**	**4.5**	**30**
	24	**M46**	**Pup**	**Open cluster**	**07 41.8**	**-14 49**	**6.1**	**27**
	25	**M93**	**Pup**	**Open cluster**	**07 44.6**	**-23 52**	**6.2**	**22**
	26	**M48**	**Hya**	**Open cluster**	**08 13.8**	**-05 48**	**5.8**	**54**
	27	**M44**	**Cnc**	**Open cluster**	**08 40.1**	**+19 59**	**3.1**	**95**
	28	**M67**	**Cnc**	**Open cluster**	**08 50.4**	**+11 49**	**6.9**	**30**
	29	**M81**	**UMa**	**Galaxy**	**09 55.6**	**+69 04**	**6.9**	**18x10**
	30	**M82**	**UMa**	**Galaxy**	**09 55.8**	**+69 41**	**8.4**	**8x3**
	31	M108	UMa	Galaxy	11 11.5	+55 40	10.1	8x1
	32	M97	UMa	Planetary nebula	11 14.8	+55 01	12.0	3x3
	33	M109	UMa	Galaxy	11 57.6	+53 23	9.8	6x4
	34	**M40**	**UMa**	**Double star**	**12 22.4**	**+58 05**	**9.1**	**50"**
	35	**M106**	**CVn**	**Galaxy**	**12 19.0**	**+47 18**	**8.3**	**18x7**
	36	**M94**	**CVn**	**Galaxy**	**12 50.9**	**+41 07**	**8.2**	**5x4**
	37	**M63**	**CVn**	**Galaxy**	**13 15.8**	**+42 02**	**8.6**	**10x5**
	38	**M51**	**CVn**	**Galaxy**	**13 29.9**	**+47 12**	**8.4**	**10x6**
	39	**M101**	**UMa**	**Galaxy**	**14 03.2**	**+54 21**	**7.7**	**22x20**
	40	M95	Leo	Galaxy	10 44.0	+11 42	9.7	6x4
	41	M96	Leo	Galaxy	10 46.8	+11 49	9.1	5x4
	42	M105	Leo	Galaxy	10 47.8	+12 35	9.2	2x2
	43	M65	Leo	Galaxy	11 18.9	+13 05	9.3	8x3

☑	Seq#	M	Const.	Type of object	R.A.	Dec	Magnitude	Size (arc-minutes)
	44	M66	Leo	Galaxy	11 20.2	+12 59	9.0	8x3
	45	M98	Com	Galaxy	12 13.8	+14 54	10.1	8x2
	46	M99	Com	Galaxy	12 18.8	+14 25	9.8	5x4
	47	M100	Com	Galaxy	12 22.9	+15 49	9.4	5x5
	48	M85	Com	Galaxy	12 25.4	+18 11	9.3	2x2
	49	M60	Vir	Galaxy	12 43.7	+11 33	8.8	3x3
	50	M59	Vir	Galaxy	12 42.0	+11 39	9.8	2x2
	51	M58	Vir	Galaxy	12 37.7	+11 49	9.8	4x4
	52	M89	Vir	Galaxy	12 35.7	+12 33	9.8	2x2
	53	**M87**	**Vir**	**Galaxy**	**12 30.8**	**+12 24**	**8.6**	**3x3**
	54	M84	Vir	Galaxy	12 25.1	+12 53	9.3	2x2
	55	M86	Vir	Galaxy	12 26.2	+12 57	9.2	3x2
	56	M90	Vir	Galaxy	12 36.8	+13 10	9.5	7x3
	57	M91	Com	Galaxy	12 35.4	+14 30	10.2	4x3
	58	M88	Com	Galaxy	12 32.0	+14 25	9.5	6x2
	59	**M49**	**Vir**	**Galaxy**	**12 29.8**	**+08 00**	**8.4**	**4x3**
	60	M61	Vir	Galaxy	12 21.9	+04 28	9.7	6x6
	61	**M53**	**Com**	**Globular cluster**	**13 12.9**	**+18 10**	**7.7**	**3**
	62	**M64**	**Com**	**Galaxy**	**12 56.7**	**+21 41**	**8.5**	**8x2**
	63	**M3**	**CVn**	**Globular cluster**	**13 42.2**	**+28 23**	**6.4**	**16**
	64	**M104**	**Vir**	**Galaxy**	**12 40.0**	**-11 37**	**8.3**	**7x2**
	65	**M68**	**Hya**	**Globular cluster**	**12 39.5**	**-26 45**	**8.2**	**3**
	66	**M83**	**Hya**	**Galaxy**	**13 37.0**	**-29 52**	**8.2**	**10x8**
	67	**M5**	**Ser**	**Globular cluster**	**15 18.6**	**+02 05**	**5.8**	**17**
	68	M102	Dra	Galaxy	15 05.1	+55 57	11.5	3x1

☑	Seq#	M	Const.	Type of object	R.A.	Dec	Magnitude	Size (arc-minutes)
	69	**M13**	**Her**	**Globular cluster**	**16 41.7**	**+36 28**	**5.9**	**10**
	70	**M92**	**Her**	**Globular cluster**	**17 17.1**	**+43 08**	**6.5**	**8**
	71	**M12**	**Oph**	**Globular cluster**	**16 47.2**	**-01 57**	**6.6**	**9**
	72	**M10**	**Oph**	**Globular cluster**	**16 57.1**	**-04 06**	**6.6**	**8**
	73	**M14**	**Oph**	**Globular cluster**	**17 37.6**	**-03 15**	**7.6**	**3**
	74	**M107**	**Oph**	**Globular cluster**	**16 32.5**	**-13 03**	**8.1**	**2**
	75	**M4**	**Sco**	**Globular cluster**	**16 23.6**	**-26 32**	**5.9**	**26**
	76	**M80**	**Sco**	**Globular cluster**	**16 17.0**	**-22 59**	**7.2**	**3**
	77	**M62**	**Oph**	**Globular cluster**	**17 01.2**	**-30 07**	**6.6**	**4**
	78	**M19**	**Oph**	**Globular cluster**	**17 02.6**	**-26 16**	**7.2**	**4**
	79	**M9**	**Oph**	**Globular cluster**	**17 19.2**	**-18 31**	**7.9**	**2**
	80	**M6**	**Sco**	**Open cluster**	**17 40.1**	**-32 13**	**4.2**	**15**
	81	**M7**	**Sco**	**Open cluster**	**17 53.9**	**-34 49**	**3.3**	**80**
	82	**M8**	**Sgr**	**Bright nebula**	**18 03.8**	**-24 23**	**6.8**	**80x40**
	83	**M20**	**Sgr**	**Bright nebula**	**18 02.6**	**-23 02**	**9.0**	**29x27**
	84	**M21**	**Sgr**	**Open cluster**	**18 04.6**	**-22 30**	**5.9**	**13**
	85	**M23**	**Sgr**	**Open cluster**	**17 56.8**	**-19 01**	**5.5**	**27**
	86	**M24**	**Sgr**	**Open cluster**	**18 16.9**	**-18 29**	**4.6**	**4**
	87	**M18**	**Sgr**	**Open cluster**	**18 19.9**	**-17 08**	**6.9**	**9**
	88	**M25**	**Sgr**	**Open cluster**	**18 31.6**	**-19 15**	**4.6**	**32**
	89	**M17**	**Sgr**	**Bright nebula**	**18 20.8**	**-16 11**	**7.5**	**46x37**
	90	**M16**	**Ser**	**Bright nebula**	**18 18.8**	**-13 47**	**6.4**	**25**
	91	**M22**	**Sgr**	**Globular cluster**	**18 36.4**	**-23 54**	**5.1**	**17**
	92	**M28**	**Sgr**	**Globular cluster**	**18 24.5**	**-24 52**	**6.9**	**6**
	93	**M11**	**Sct**	**Open cluster**	**18 51.1**	**-06 16**	**5.8**	**14**

☑	Seq#	M	Const.	Type of object	R.A.	Dec	Magnitude	Size (arc-minutes)
	94	**M26**	**Sct**	**Open cluster**	**18 45.2**	**-09 24**	**8.0**	**15**
	95	M57	Lyr	Planetary nebula	18 53.6	+33 02	9.3	1x1
	96	**M56**	**Lyr**	**Globular cluster**	**19 16.6**	**+30 11**	**8.3**	**2**
	97	**M39**	**Cyg**	**Open cluster**	**21 32.2**	**+48 26**	**4.6**	**32**
	98	**M29**	**Cyg**	**Open cluster**	**20 23.9**	**+38 32**	**6.6**	**7**
	99	**M27**	**Vul**	**Planetary nebula**	**19 59.6**	**+22 43**	**7.6**	**8x4**
	100	**M71**	**Sge**	**Globular cluster**	**19 53.8**	**+18 47**	**8.3**	**6**
	101	**M69**	**Sgr**	**Globular cluster**	**18 31.4**	**-32 21**	**7.7**	**3**
	102	**M70**	**Sgr**	**Globular cluster**	**18 43.2**	**-32 18**	**8.1**	**4**
	103	**M54**	**Sgr**	**Globular cluster**	**18 55.1**	**-30 29**	**7.7**	**6**
	104	**M55**	**Sgr**	**Globular cluster**	**19 40.0**	**-30 58**	**7.0**	**15**
	105	**M75**	**Sgr**	**Globular cluster**	**20 06.1**	**-21 55**	**8.6**	**2**
	106	**M15**	**Peg**	**Globular cluster**	**21 30.0**	**+12 10**	**6.4**	**8**
	107	**M2**	**Aqr**	**Globular cluster**	**21 33.5**	**-00 49**	**6.5**	**13**
	108	M72	Aqr	Globular cluster	20 53.5	-12 32	9.4	2
	109	M73	Aqr	Asterism	20 58.9	-12 38	9.0	3
	110	M30	Cap	Globular cluster	21 40.4	-23 11	7.5	6

Binoculars used: _____

Total objects seen: _____