

TMSP OBSERVERS CHALLENGE - 2012

PLEASE READ - SEVERAL CHANGES FOR THIS YEAR

We are heading North for this years list, exploring an area of the sky often ignored. This years list is designed for observing on the main observers field so if you have planted yourself with trees to the North you will not be able to do this list.

There is also a slight change in formatting and an exploration of the night sky, **MORE** than just a list. There are 30 list items and closer to 3 times this many objects listed. The **fun** this year is not only locating a list object but also observing groups of objects. You will find multiple galaxies in one field of view or a galaxy and double stars or other combinations. Observing any **one** object in each list item gets you your needed check off - please note, observing more than one object in each list group doesn't earn any additional credit - but stopping and observing the others will make your time more **fun**. Most groups listed are within a 1 degree field of view. Objects found at the top of list should be done first as these are rapidly going down (setting). The last object, Kemble's Cascade wont be observable until later in the evening so plan accordingly.

Not all objects require a telescope, so think about what you are trying to observe. There will be some volunteers with large aperture scopes assigned with the task of assisting those observers with objects beyond their reach. The large aperture volunteers will have a sign designating their location, objects to be observed and times for public viewing. Need help? Don't be shy, ask for assistance. If you are a first timer to TMSP observers challenge we might recommend you start with the the first list (2007) as generally this is an easier list. However this years list will also be an excellent introduction to your night sky experience. You might consider observing with a partner, much more **fun!!!** Don't be shy, just about anyone with a scope on the field will be happy to help with an object or two. Yes, there are some tough items on the list, hence the name "Observer's challenge." Part of the concept of the challenge is to take you a little out of your comfort zone, to explore objects that you might not normally view or to look at the night sky with a little different perspective. Most of all, we want you to enjoy the hunt.

This year we also added finder charts for all objects. These charts are available as a single pdf file that you can download from the website. There are 30 star charts, take a look and see what to expect for this years challenge. One booklet containing a copy of the charts will be at the TMSP information booth.

As always the ever popular #31 is on the list - Observers choice, you choose your favorite, easy, difficult, or? Your choice, and who knows, you may even see a future challenge list made up of TMSP “favorites”, chosen by YOU!

All observations must be made at TMSP and 25 out of 30 objects must be viewed to earn a unique TMSP Observer's Award lapel pin. Again, viewing multiple objects in a “group” does not count extra toward your 25. Viewing ANY ONE of the group members DOES count. A good example is: List item #2 which consists of 5 galaxies. Viewing any or all of the galaxies allows you to check off list item #2, counting as 1, of your 25 required items to earn the pin.

You must create a record of your observations which include date, time, instruments used and a brief description and/or sketch of the object. Your records will be returned to you.

Most importantly:
HAVE FUN!!!!

2012 TMSP Observer's challenge

Object	Object Type	RA, DEC	Const	Alt, Az	Mag	Size	Sep, PA	Atlas page numbers					Comments
								SA 2000	U 2000	MSA	U 2000.2	PSA	
1	Coma Cluster	Galaxy cluster	13h 00' 43" +27° 54' 04"	Com	+22°04'.4 287°46'.2	11.4v	3'.0	7	I, 149	II, 653	I, 71	45	There are at least 34 galaxies in a 1 degree FOV centered on this point in the sky. Can you see any? NGC4889 is the brightest at mag 11.4. Locating the center of the cluster does not require optical aid.
2	NGC 4278	Galaxy	12h 20' 44" +29° 12' 55"	Com	+16°40'.9 295°14'.7	10.2v	3'.6	7	I, 108	II, 655	I, 72	45	
	NGC 4274	Galaxy	12h 20' 26" +29° 32' 56"	Com	+16°52'.3 295°32'.3	10.4v	6'.9	7	I, 107	II, 655	I, 54	45	
	NGC 4245	Galaxy	12h 18' 14" +29° 31' 55"	Com	+16°31'.4 295°52'.9	11.4v	3'.3	7	I, 107	II, 655	I, 54	45	At the NE end of a chain of 4 mag 11 stars, small and faint
	NGC 4314	Galaxy	12h 23' 14" +29° 48' 56"	Com	+17°29'.4 295°17'.1	10.5v	4'.8	7	I, 108	II, 654	I, 54	45	
3	NGC 5350	Galaxy	13h 53' 57" +40° 18' 31"	CVn	+38°23'.5 291°01'.4	11.4v	3'.2	7	I, 76	II, 608	I, 53	42	A nice group of galaxies from mag 10.8 up to 14.6, how many can you see?
	NGC 5353	Galaxy	13h 54' 03" +40° 13' 31"	CVn	+38°21'.7 290°55'.3	11.1v	2'.8	7	I, 76	II, 608	I, 53	42	
	NGC 5354	Galaxy	13h 54' 03" +40° 14' 31"	CVn	+38°22'.2 290°56'.3	11.5v	2'.3	7	I, 76	II, 608	I, 53	42	
	NGC 5355	Galaxy	13h 54' 21" +40° 17' 31"	CVn	+38°26'.7 290°57'.1	14.0b		7	I, 76	II, 608	I, 53	42	
	NGC 5358	Galaxy	13h 54' 39" +40° 13' 31"	CVn	+38°27'.4 290°50'.4	14.0b		7	I, 76	II, 608	I, 53	42	
	NGC 5371	Galaxy	13h 56' 14" +40° 24' 32"	CVn	+38°48'.7 290°49'.1	10.8v	4'.4	7	I, 76	II, 608	I, 53	42	
4	M 63	Galaxy	13h 16' 22" +41° 58' 13"	CVn	+33°32'.3 297°42'.3	8.6v	12'.3	7	I, 76	II, 609	I, 37	43	Sunflower Galaxy Look for a stellar nucleus
5	Alpha Canes Venatici	Double Star	12h 56' 0" +38° 19' 10"	CVn	+28°13'.6 297°07'.9	2.9, 5.5	19.4" 229°	7	I, 108	II, 631	I, 53	43	Cor Corioli: a double star located 110 light years from Earth
6	M 106	Galaxy	12h 19' 37" +47° 13' 59"	CVn	+28°46'.3 309°46'.6	8.3v	18'.2	7	I, 74	II, 592	I, 37	43	Another galaxy group, how many can you see?
	NGC 4220	Galaxy	12h 16' 49" +47° 48' 59"	CVn	+28°47'.0 310°38'.0	12.0b	4'.1	7	I, 74	II, 592	I, 37	43	Very faint with non-stellar nucleus. Can you detect 4218 15' north?
	NGC 4217	Galaxy	12h 16' 25" +47° 01' 59"	CVn	+28°13'.7 310°00'.0	12.0b	5'.5	7	I, 74	II, 592	I, 37	43	Located S of Mag 9 and 11 stars. Look for NGC 4226, 7.4' SE @ mag 14.4
7	N Corona Borealis	Double Star	15h 23' 13" +30° 17' 12"	CrB	+47°27'.8 265°24'.3	5.6, 5.9	0.8" 63°	7	I, 112	II, 646	I, 51	53	Very tight double star. Could you split it? The challenge is to split this double. Try a bazillion power!
8	NGC 4088	Galaxy	12h 06' 14" +50° 28' 59"	UMa	+29°10'.4 314°14'.4	10.5v	5'.8	7	I, 47	II, 592	I, 37	43	Look for a stellar core at 150x. Do you see a special shape?
	NGC 4085	Galaxy	12h 06' 02" +50° 16' 58"	UMa	+29°01'.2 314°05'.3	12.3v	2'.8	7	I, 47	II, 592	I, 37	43	Located 11' S of 4088, can you see both in the same field?

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List #	Object	Object Type	RA, DEC	Const	Alt, Az	Mag	Size	Sep, PA	Atlas page numbers					Comments
									SA 2000	U 2000	MSA	U 2000.2	PSA	
9	M 109	Galaxy	11h 58' 14" +53° 18' 58"	UMa	+30°03'.3 317°38'.7	9.8v	7'.6		2	I, 47	II, 575	I, 24	32	Located near 2 nd mag star Gamma Ursa Major. Look for a 12mag star superimposed on this galaxy.
10	NGC 3718	Galaxy	14h 05' 09" +54° 50' 40"	UMa	+27°03'.6 320°13'.4	10.5v	8'.7		2	I, 47	II, 575	I, 24	32	These 2 galaxies are close together and faint within a 20' field
	NGC 3729	Galaxy	11h 34' 29" +53° 03' 59"	UMa	+27°14'.2 320°08'.2	11.4v	3'.1		2	I, 47	II, 575	I, 24	32	
11	M 108	Galaxy	11h 12' 13" +55° 36' 02"	UMa	+26°43'.2 324°43'.1	10.1v	8'.3		2	I, 46	II, 576	I, 24	31	Two Messier objects in a 1 degree field, does it get any better than this?
	M 97	Planetary Nebula	11h 15' 31" +54° 57' 01"	UMa	+26°34'.8 323°50'.1	11.2v	3'.2		2	I, 46	II, 576	I, 24	31	Owl Nebula. Can you see the "eyes"? A challenge for large scopes: A faint galaxy lies 3.7' SE of the nebula's center.
12	NGC 3613	Galaxy	11h 19' 19" +57° 56' 01"	UMa	+29°03'.5 325°48'.3	12.0b	3'.6		2	I, 46	II, 561	I, 24	31	Two faint galaxies close together in one field, look for the box shaped Asterism of mag 10-11 stars just E of 3613
	NGC 3619	Galaxy	11h 20' 06" +57°42' 01"	UMa	+28°58'.3 325°31'.7	13.0b	3'.1		2	I, 46	II, 561	I, 24	31	Also look for NGC3625, 9.5' West
13	NGC 5676	Galaxy	14h 33' 15" +49° 24' 57"	Boo	+48°49'.6 297°33'.1	10.9v	3'.9		7	I, 77	II, 586	I, 36	42	Look for an elongated core
	IC 1029	Galaxy	14h 32' 57" +49° 50' 57"	Boo	+48°56'.7 298°11'.4	11.3v	3'.0		7	I, 77	II, 586	I, 36	42	This is a very faint needle like companion to 5676 located 27' N
14	Kappa Bootes	Double Star	14h 11' 43" +52° 01' 15"	Boo	+46°39'.8 303°03'.6	4.5, 6.5	13.3" 0		2	I, 49	II, 570	I, 23	42	Two nice doubles
	Iota Bootes	Double Star	14h 14' 49" +51° 36' 15"	Boo	+46°56'.8 302°13'.9	5, 7.5	38.5" 0		7	I, 49	II, 570	I, 23	42	
15	NGC 5585	Galaxy	14h 20m13" +56° 40' 50"	UMa	+49°22'.6 309°01'.3	10.9v	5'.5		2	I, 49	II, 570	I, 23	41	NGC5585 is located in a group of galaxies, 1 degree in diameter. Can you locate 3 stars in a linear group about 35' E? Can you split them?
	WDS STF 1831 AB	Double Star	14h 16' 34" +56° 39' 16"	UMa	+48°53'.4 309°12'.1	7.6, 9.5	5.8" 137°		2	I, 49	II, 570	I, 23	41	
16	M 101	Galaxy	14h 03' 39" +54° 17' 39"	UMa	+46°23'.3 306°46'.9	7.7v	26'.9		2	I, 49	II, 570	I, 23	42	Pinwheel Galaxy with several companions close by. Can you see M101's nucleus or spiral arms? Several stars are superimposed on the galaxy's face. How many can you see?
	NGC 5474	Galaxy	14h 05' 27" +53° 36' 40"	UMa	+46°23'.0 305°43'.1	10.9v	4'.5		2	I, 49	II, 570	I, 23	42	
	NGC 5473	Galaxy	04h 05' 09" +54° 50' 40"	UMa	+46°47'.2 307°25'.0	11.4v	2'.6		2	I, 49	II, 570	I, 23	42	Look for faint star 20" NE of center.

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									SA 2000	U 2000	MSA	U 2000.2	PSA	
17	NGC 4041	Galaxy	12h 02' 49" +62° 04'	UMa	+35°52'.2 325°28'.9	11.1v	2'.8		2	I, 25	II, 559	I, 24	41	Another set of faint galaxies together. NGC 4036 lies 15' SSW. Is it the same shape as 4041? Look for a line of three, 6-7mag stars SE and 3, 9 th mag stars in a line ENE. Stars count as an object of #17
	NGC 4036	Galaxy	12h 02' 02" +61° 50'	UMa	+35°39'.6 325°18'.7	10.6v	4'.5		2	I, 25	II, 559	I, 24	41	Look for the core.
18	NGC 6946	Galaxy	20h 35' 07" +60° 11' 43"	Cep	+69°49'.9 40°19'.8	8.9v	11'.0		3	I, 56	III, 1074	I, 20	61	
	NGC 6939	Open Cluster	20h 31' 42" +60° 40' 40"	Cep	+69°57'.9 38°30'.5	7.8v	8'.0		3	I, 56	III, 1075	I, 20	61	A galaxy, double star and open cluster close together.
	Struve 2717	Double Star	20h 38' 07" +60° 48' 07"	Cyg	+69°13'.2 39°17'.7	7.3, 9.5	2.0" 259° c 9.7m 43"		3	I, 56	III, 1074	I, 20	61	
19	NGC 2300	Galaxy	07h 35' 50" +85° 41' 13"	Cep	+43°01'.4 358°47'.3	11.0v	3'.1		1	I, 1	I, 3	I, 1	21	Listed as Arp 114, interacting galaxies. This will require an 8" scope or larger. Double star WDS 1059 lies at one end of 2276, opposite of NGC 2300
	NGC 2276	Galaxy	07h 30' 54" +85° 43' 17"	Cep	+43°02'.5 358°55'.3	11.4v	2'.6		1	I, 1	I, 3	I, 1	21	Located 6' ENE of 2300 and 2' ENE of a mag 8.5 star. Lays within a patch of 4 stars aligned E-W
20	Polaris	Double Star	02h 47' 07" +89° 18' 47"	UMi	+46°54'.5 00°52'.4	2.1, 9.1		18.1" 232°	1	I, 1	I, 2	I, 1	1	Polaris is a double star. Notice the circlet of 7 and 8 mag stars 35' in diameter known as the "Engagement Ring"
21	NGC 188	Open Cluster	00h 45' 28" +85° 23' 53"	Cep	+47°06'.7 06°46'.2	8.1v	14'.0		1	I, 1	I, 6	I, 1	1	Open cluster of approx 550 stars. You will see about 50 stars mag 13 or fainter.
22	NGC 6281	Cluster Nebulosity	17h 05' 42" -37° 55' 01"	Sco	+01°47'.7 200°00'.0	5.4v	1°.0		22	II, 376	III, 1440	II, 164	58	This is about the most southerly object you can see from TMSP. Catch this as it travels between the light domes of Yakima and Ellensburg. Contains about 70 stars. You'll see about 20 in a haze.
23	Galactic Center	Point in Space	17h 45' 43" -28° 59' 57"	Sgr	+12°27'.0 194°00'.4				22	II, 377	III, 1416	II, 146	56	This is the rotational center of our galaxy with "our" largest black hole located within. Last year's list pointed you to the North Galactic Pole. Now do you know where you are in our galaxy?
24	North Ecliptic Pole	Point in Space	18h 00' 03" +66° 33' 44"	Dra	+69°40'.6 346°07'.2				3	I, 30	III, 1066	I, 11	51	Think about this, what is the North Ecliptic Pole? Answer? "North Pole" of our solar system
	NGC 6543	Planetary Nebula	17h 58' 39" +66° 38' 12"	Dra	+69°33'.1 345°50'.6	9.0b	5'.8		3	I, 30	III, 1066	I, 11	51	Cat's Eye nebula: Planetary nebula located very close to the Ecliptic Pole. 3' from a mag 8 star. Can you detect the nebula's shape?

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									SA 2000	U 2000	MSA	U 2000.2	PSA	
25	Dziban, Psi Draco	Double Star	17h 41' 46" +72° 08' 53"	Dra	+63°56'.4 348°27'.5	4.6, 5.6		29.8" 16°	3	I, 30	III, 1054	I, 11	51	
26	16 Draconis	Double Star	16h 32' 14" +52° 54' 16"	Dra	+67°39'.7 297°19'.1	5, 5.5		90.3" 194°	3	I, 52	III, 1097	I, 22	52	These stars are visible to your unaided eye. Companions require optical aid.
	17 Draconis	Double Star	16h 32' 38" +52° 55' 16"	Dra	+67°43'.3 297°21'.8	5.5, 6.5		3.2" 109°	3	I, 52	III, 1097	I, 22	52	
27	NGC 457	Open Cluster	01h 19' 56" +58° 23' 46"	Cas	+35°13'.0 39°27'.0	6.4v	13'.0		1	I, 36	I, 48	I, 29	1	Dragonfly cluster: A pair of open clusters. Phi Cassiopeia is part of NGC 457 and is a super luminous star with the output of 200,000 suns. Cluster is also known as the E.T. Cluster. Use a larger scope to locate some 10+ mag carbon stars
	NGC 436	Open Cluster	01h 16' 26" +58° 52' 48"	Cas	+35°52'.0 39°16'.3	8.8v	6'.0		1	I, 36	I, 48	I, 29	1	
28	NGC 2985	Galaxy	09h 51' 28" +72° 13' 31"	UMa	+33°41'.5 344°45'.6	10.5v	4'.3		2	I, 23	II, 538	I, 14	31	This group of faint galaxies is located approx 3 degrees due N of M81-82. Can you see the 12.5mag star on the E edge of 2985, 1' from the nucleus?
	NGC 3027	Galaxy	09h 56' 45" +72° 08' 28"	UMa	+33°51'.8 344°18'.5	12.0b	4'.7		2	I, 23	II, 538	I, 14	31	
29	IC 3568	Planetary Nebula	12h 33' 10" +82° 29' 05"	Cam	+46°13'.8 349°07'.6	10.6b	6".0		2	I, 9	II, 520	I, 5	41	Baby Eskimo
30	Kembles Cascade	Asterism		Cam					1	I, 18	I, 43	I, 28	11	An asterism of about 20 colorful 5 th to 10 th mag stars in a stright line over a distance of 2-1/2 degrees with NGC 1502 at one end
	NGC 1502	Open Cluster	04h 08' 20" +62°	Cam	+24° 09' 19°02'	5.7v	8'.0		1	I, 18	I, 43	I, 28	11	
31	Observer's choice													An object of your choosing

α - Alpha, β - beta, γ - gamma, δ - delta, ε - epsilon, ζ - zeta, η - eta, θ - theta, ι - iota, κ - kappa, λ - lambda, μ - mu, ν - nu, ξ - xi, ο - omicron, π - pi, ρ - rho, σ - sigma, τ - tau, υ - upsilon, φ - phi, χ - chi, ψ - psi, ω - omega