

# 2017 TMSP Observers Challenge

10 year anniversary!!!

## List #10

Welcome to the TMSP Observers Challenge and welcome to the first decade of challenges provided by several active members. The lists reflect the passions and interests of the list makers and represent a large variety of observing possibilities, objects often found outside lists confined only to the night time skies. Lists are simply guides to allow beginners an opportunity to take the first steps in exploring our universe, and provide support and guidance to experienced observers looking for greater challenges.

In our first decade, we have explored almost every type of observable object to be found in our night skies. We have touched on where we as humans and our Earth and Solar System are traveling amongst the stars and with some imagination, we can simply stand and “feel” the rotation of our galaxy. Observing lists bring people together to share in the exploration and often new friendships are built when sharing the same interests and goals.

This years 2017 list is providing new and more difficult challenges. The intent is to push your boundaries, your comfort zone, your skills, and your knowledge of what you have already learned and experienced. This list might very well require you to use larger instruments than what you own and will ultimately result in new observational skills, set at your limits. Star hopping is by far the best way to understand what you are searching for, will require you to keep your orientation in a crowded field of stars and galaxies and will provide you with more accurate data to confirm both false and real observations of challenging objects. Observing with a team mate or small group will provide you with more confidence and energy to seek out the list objects, however this might also deny you some of the challenges and increased skills you obtain by star hopping if you allow only your teammate to do the work. Make sure you can find these objects on your own and that you understand what you are really observing.

One additional comment; there are 9 planetaries on this list, again, one more opportunity to examine and compare the similarities and the differences these objects provide.

This years list might well require more nights than available at any one TMSP event, but keep in mind this is not a race but an experience. There are “only” 25 objects needed to gain the ultimate prize, the special ten year pin..... doing all 30 will make you a pro!!! Keep in mind, this is a fun list, a hard working list and an opportunity to learn and expand your horizons.

Kreig and Tom

# 2017 TMSP Observers Challenge

#1

## The Big Dark Cigar B-168

As the first item on the list, take some time to locate where this is in your night sky. Dark Nebula will need dark transparent skies for easy identification. If not seen, wander back to this list item a few hours later when night skies are really dark and try again or come back if you notice the skies have high transparency.

Barnard 168, is also listed as LDN-1030, is a dark nebula, elongated several degrees and almost appears to emanate from the Cocoon Nebula. The Dark Cigar is an analogy but still a decent description. Your goal is the dark nebula. The Cocoon(IC 5146), Collinder 470 the star cluster within the Cocoon and the reflection Nebula (VDB-147) are simply extra gifts for your enjoyment.

B 168                      21h 48'    +47deg 25'

#2

## Galaxy

Barred galaxy sometimes called The Mini M-31. Observers with larger scopes describe it as looking like M-31 through a 4" scope. In photographs there is a line of stars along side the long axis of the galaxy. Can you see this line?

IC-239 is a smaller and fainter face on spiral that lies to the west. Can you see both in the same field?

NGC1023 02h 41' 29", +39 08', Perseus, 9.5M, 8.7'

#3

## PLUTO

Pluto, oh yes, Pluto, that controversial celestial body, slowly, and I mean very slowly orbiting our sun and currently placed low in the southern skies. At Magnitude 14+, Pluto can be quite a challenge. Best to use the supplied charts and become VERY familiar with the star patterns and groupings. You will need at least an 8" scope for brief glimpses and a larger scope for those wanting a direct view. Pluto will be the very tiniest of "stars", and has no observable disk. Best way for confirmation is to make a sketch of what you see and check again many hours later or better yet, the next evening to detect movement. Always a fun challenge for those seeking out difficult objects and to really see our Ninth Planet.

#4

## Planetary

53" sized planetary that despite it's listed 13.3m, appears brighter and it's central star can be glimpsed in an 8" scope. Do you detect any color in the nebula?

Can you see it's central star?

NGC1501 04h 08' 28", +60 57' 20", Camelopardalis, 13m, 53"

#5

## STF 115

A close, <1", 7magnitude pair in Cassiopeia that will require high power to split. Similar to another double on this list, time well spent here to work on your observing skills for what waits you later..... :-)

Struve115 01h 24m 25" +58 13' 08" 0.6" separation! Good luck!

#6

## Double Star in Andromeda

A very pretty double that looked beautiful in my 6" refractor and an "easier" pair for this years list.

STF24 (Struve24) 00h 18' 24", +26 14' 4",

Andromeda, 8.4m 4.9" sep

#7

## NGC 6874

An open cluster, discovered by William Herschel in 1792 he called it: "a coarsely scattered cluster of large stars, of a right-triangular shape.

"NGC6874 (Basil 6) 20h 07' 48" +38 21', Cygnus

#8

## The Fairy Ring

or

## Tommies Arc

"Chaples Arc/Fairy Ring/Tom and Kreig's Arc/Table Mt Arc, Your Name Here Arc" 20h 04' 17", +38 17'

This is a 1/2 degree arc of double stars in Cygnus that I found in a 2009 web article by Glenn Chaple. He discovered it by accident, liked it, and promptly named it after himself. Since this is by no means an official name, you can do the same. Check out this arc of doubles and if you like it, name it after yourself.

There's a 2006 thread about it on Cloudynights:

[www.cloudynights.com/topic/76058-chaples-arc-4-sept-06/#entry996205](http://www.cloudynights.com/topic/76058-chaples-arc-4-sept-06/#entry996205)

## #9

### Galaxies and Doubles beyond The Andromeda Galaxy.

Next on the list are two challenging objects found close by the Andromeda Galaxy.

GOTO might get you where you want to be but hopping around the stars and understanding the patterns will help greatly in properly identifying the objects.

Take your time to understand your orientation so you wont be looking at the wrong stars and searching for objects that will not be there. So, move your scopes up to the Andromeda Galaxy and then over to M-32. Wander Southward about 0.6 degrees and begin your hunt using the chart included. What are we looking at? A double star within the Milky Way, close to us and a remote distant galaxy unbound by gravitation by either "us" or Andromeda. There are many more galaxies in this immediate area and within your FOV but difficult to impossible to see without very large apertures.

Objects to be observed:

1 A double star located at: 00H 42.6' + 40 deg 18' Mag 9.5 and 13.1

Move (W) about 45" and 25" (N) to another star and search for:

1 G 2506 2506 is 12.4 mag

Best to draw out what you see, even a simple sketch will help with your orientation and identification.

## #10

### Planetary Central Star

A small planetary located in a rich field of the Milky Way.

Can you see the central star?

NGC6751 19h 06'48" -05 58' 11", 13m, 18" dia.

# #11

## G-73

G-73 is a globular cluster located near NGC-205, a satellite galaxy of the great Andromeda Galaxy. The orbits of NGC-205, M32, and M31 indicate that there have been past interactions and the star-forming history of NGC 205 is directly correlated with the orbit about M31 and shows evidence for multiple episodes of star formation during the past one billion years. My research does not show whether G-73 is a part of M-31 or NGC-205. This is the brightest Globular near NGC-205 at Magnitude 15, and will appear as a faint star. You will find this faint cluster about 6' east of the center of NGC 205. See the enclosed chart.

00H 40' 55" +41deg 41' 15"

# #12

## Small Planetary

An even smaller planetary with an 11th magnitude star touching it's west edge.

NGC6741 19h 03' 28", -0 25' 14", Aquila, 11m, 6" dia

# #13

## 5 Doubles plus more!

Here is a nice field of stars with several doubles and a triple, chosen for your enjoyment. Located up near Mu – Andromeda, low enough in the night sky for comfortable viewing and a fun place in the sky to explore. Use the enclosed chart to assist you in your search. The triple star system is slightly West of the 5 doubles, an easy “nudge” with your scope. Yes, you need to observe ALL 5 doubles and the triple.

The 7.7 – 12.0 mag double is located at: 00H 54' 17", +39 04'

#14

## A Planetary????

Small and faint. A challenge object for smaller scopes for sure.

NGC6790 19h 24', +1 33' 15", Aquila, 10m, 6" dia

#15

## Draco Dwarf

The Draco Dwarf Galaxy is a part of the local galaxy group and a satellite galaxy of our Milky Way. Often listed at Magnitude 10.9 however this is NOT a visual magnitude. Also this galaxy spans approximately 24 x 35 minutes thus making this fainter than 12.4 visual. Take your time for this faint faint galaxy and remember, gravity from this galaxy is pulling on you also.

Mag 10.9      17h 20' 12'      +57deg 54' 55"

#16

## Planetary Nebula

Here's an easier one for you (phew!) This is a nice planetary nebula with a slightly darker interior and a fainter northern edge. Large scopes show a sprinkling of stars embedded in the disk.

One of Tom's favorites in this area.

NGC 6781 19h 19' 13", +6 35' 10", Aquila, 12m, 1.8' dia

## #17

### Observing Uranus with no optical aid.

Although we often think about the five visual planets when we wander out to view both daytime and nighttime skies, Uranus, our sixth planet is also visible to the unaided eye.

Using the enclosed sky chart, find a nice comfortable chair, pour yourself a nice hot mocha, relax and orient your star patterns, relax and explore the area where Uranus should be. Yes, you might think you saw it but did you really? Take more time, stay away from ANY red lights, let your eyes relax and eventually you will see more than an occasional glimpse. With crystal clear skies you should be able to view directly.

During the evening as you work on other projects, take a minute or two and come back to view Uranus again. As your skills improve, your ability to view this planet will improve greatly.

## #18

### Miranda, Ariel, Umbriel, Titania, Oberon

Uranus rises late in the evening placing good viewing for late at night. Your challenge are four of Uranus's 27 known satellites and a bonus for you if you like to chase down 15.8 mag Miranda. These “brighter” moons can be seen in moderate to large amateur telescopes. Both Titania and Oberon have been glimpsed with apertures as small as 20 centimeters (8 inches). Umbriel and Ariel, however, because they lie much closer to the planet's glare, are normally difficult with even twice that aperture. You are required to observe 4 of the five listed here.

After you complete observers challenge #17, naked eye views of Uranus, you now know where to chase down these faint and exotic moons.

Moon	V Mag	Orbital frequency	
Miranda	15.8 mag	33.5 hours	(Optional Challenge.)
Ariel	14.4	2.5 days	
Umbriel	14.5	4 days	
Titania	13.5	8 days	
Oberon	13.7	13.5 days	



#19

## Planetary Nebula

This planetary has a disk that isn't completely round and its central star is 14m.

The nebula is surrounded by faint stars.

How many do you see?

NGC6804 19h 32' 24", +9 15' 24", Aquila, 12m, 1' dia

#20

## Small Planetary Nebula

A tiny 6" diameter planetary disk. Try "blinking" with a nebula filter to distinguish it from nearby stars at lower power.

NGC6803 19h 32', +10 05' 28", Aquila, 11m, 6" diameter

#21

## Triton

Triton is the only major moon of Neptune which currently is known to have 14 moons. Visible in moderate sized scopes at magnitude ~ 13.5, you will find this an easier target than Pluto. Triton has a retrograde orbit and its close proximity to Neptune (closer than the Moon is to Earth), tidal deceleration will cause Triton to spiral inward, which will lead to its destruction in a few billion years. So, now is a good time for viewing before the demise of this interesting moon. Take a few minutes and use Binoculars to locate Neptune and then chase down Triton, you will need an 8" or larger scope. Observe this moon several hours apart or the next night to detect motion and confirmation.

#22

## Planetary Nebula

My database program lists this as 1.2', yet my notes say "small". Other sources say 21" and 12". Hubble images show a second, larger outer bubble so this may account for the difference between the database and observations. This nebula has a high surface brightness and a fairly bright 12.3m central star. Larger scopes may show it as a blue disk.

NGC6891 20h 16', +12 45' 24", Delphinus, 1.2'??

#23

## 66 Pisces

Here is a nice challenge for those of you enjoying to chase down challenging double stars. Located in Pisces and just to the "left" of Pegasus's Square is 66 Pisces and also listed as OΣ 20 on page 5 of Sky and Telescopes "Pocket Sky Atlas". These are 6 and 7<sup>th</sup> magnitude stars with a 0.6" Separation.

As a starter try a 10" scope or larger and very high magnifications, 300x, 400X and more. Take your time to observe, improve your observing skills and as a hint check inside or near the edge of the airy disk.....

RA 00 54 35 Dec +19 11 18 PA 117

#24

## The "Last" Planetary

Another real challenge object, not because it's faint, but because it's tiny size makes it difficult to distinguish from a star. Again, blinking with a narrow-band nebula filter can give it away. Crank the power. Does it become non-stellar at high power? The nebula makes a "double" with a slightly brighter star close by. Most observers list this as "stellar"

IC4997 20h 20' 58", +16 49', Sagitta, 12m, 2" dia(?)

#25

## Kreig's Domino

Now for a real treat and a really really difficult challenge, just for you!!!

A set of "domino's" found in the NGC 884, ½ half of the double cluster.

Located within this delightful open cluster of stars are 15+ magnitude stars all lined up to form an aster-ism of two domino's. As mentioned earlier, this will require the use of a chart and correct orientation, star hopping and a lot of patience and for most of you, a much larger scope. So, get out a cup of coffee and come play domino's with your fellow astronomers.

Domino – 02H 22m 9" +57deg 06' 09"

#26

## 7 Galaxies

Here is a nice and difficult view of a small cluster of 7 galaxies, all NGC objects with one exception; a non-NGC - USNO galaxy trying to join the party. NGC 7331 is "only" 50 million light years away, the others are much farther away and related by sight-line only. Keep in mind, magnitudes can deceive you, several of these galaxies are NOT easy to see.

NGC 7331, 7335, 7336, 7337 and 7340 make up a group with both NGC 7326 and the USNAO slightly NW of the main grouping. Try to use some alignment stars to work your way around the FOV.

NGC 7326	Mag 12.3	Good luck with this one.
NGC 7331	Mag 9.5	Elongated with visible core.
NGC 7335	Mag 10.4	"Easily" visible next to 7331.
NGC 7336	Mag 11.3	Faint circular spot.
NGC 7337	Mag 10.9	Very tiny and looks like a double star near a 10 <sup>th</sup> mag star.
NGC 7340	Mag 10.7	The 10.4 and 11.1 mag stars "point" to this object.
USNAO2-1200-19353750	Mag 11.3	Good luck :-)

## #27

### Draco Trio

A nice Trio of Galaxies with two types of Galaxies in three different orientations ranging in size from 2.4 min to 5.5 min.

Avery nice view, Enjoy!!

NGC 5981	Mag 13	Edge-on	
NGC 5982	Mag 11.1	Elliptical	
NGC 5985	Mag 11	Face-on-spiral	
		15h 38' 40"	+59 deg 21' 22"

## #28

### Andromeda Satellites

Here you will find 3 Galaxies, all in orbit around the great Andromeda Galaxy; M-31. Use the included chart for your explorations.

Come back to TMSP in 2018 and observe again.

Will you see any movement as they fly around M-31??

NGC 147	Mag 9.5	00h 33.2min	+48deg 30'
NGC 185	Mag 9.2	00h 39min	+48deg 20'
NGC 278	Mag 10.8	00h 52.1min	+47deg 33'

## #29

### 2 Galaxies- NGC 5905 and 5908

Struggling to complete the list of 25? Almost ready to cry or hunt down Tom and Kreig for such an evil list? Well here is an opportunity to add to your observers list and much easier than many others so relax and enjoy these 2 galaxies.

NGC 5905 is a face-on, barred spiral. Try some high power such as 300x and try to detect one or both arms.

NGC 5908 is a very nice edge-on galaxy with an "easily" seen dust lane.

5905	Mag 11.7	15h 15.4'	+55deg 31'
5908	Mag 11.8	15h 16.7'	+55deg 25'

#30

USNAO2 1275-00405751

## Ultimate Challenge

The Ultimate Challenge; a 15.1 magnitude Galaxy found inside a small copy of the Corona Borealis made up of 13 to 16<sup>th</sup> magnitude stars.

Yes, correct, we are reaching out into 16<sup>th</sup> magnitude.

The galaxy we are searching for is “only” 15<sup>th</sup> mag yet we all know surface brightness will be lower. This aster-ism and Galaxy are located almost within the glow of the Satellite Galaxy of Andromeda known as M-110 and also NGC 205

The key for this observation is excellent observing skills with plenty of practice star hoping, a lot of patience, a very BIG scope, at least 20+ inches and very clear transparent skies. I have challenged a few people with this object and no one has yet seen it, so now you now why I call this the “Ultimate Challenge”. By the time you become extremely frustrated and want to yell at someone, I will have already packed up and left the site, so go yell at Tom instead.

My finder chart enclosed.

00h 40' 22"      +41deg 34' 08"

We have spent countless hours to provide you with interesting perspectives out towards the edges of our visible universe.

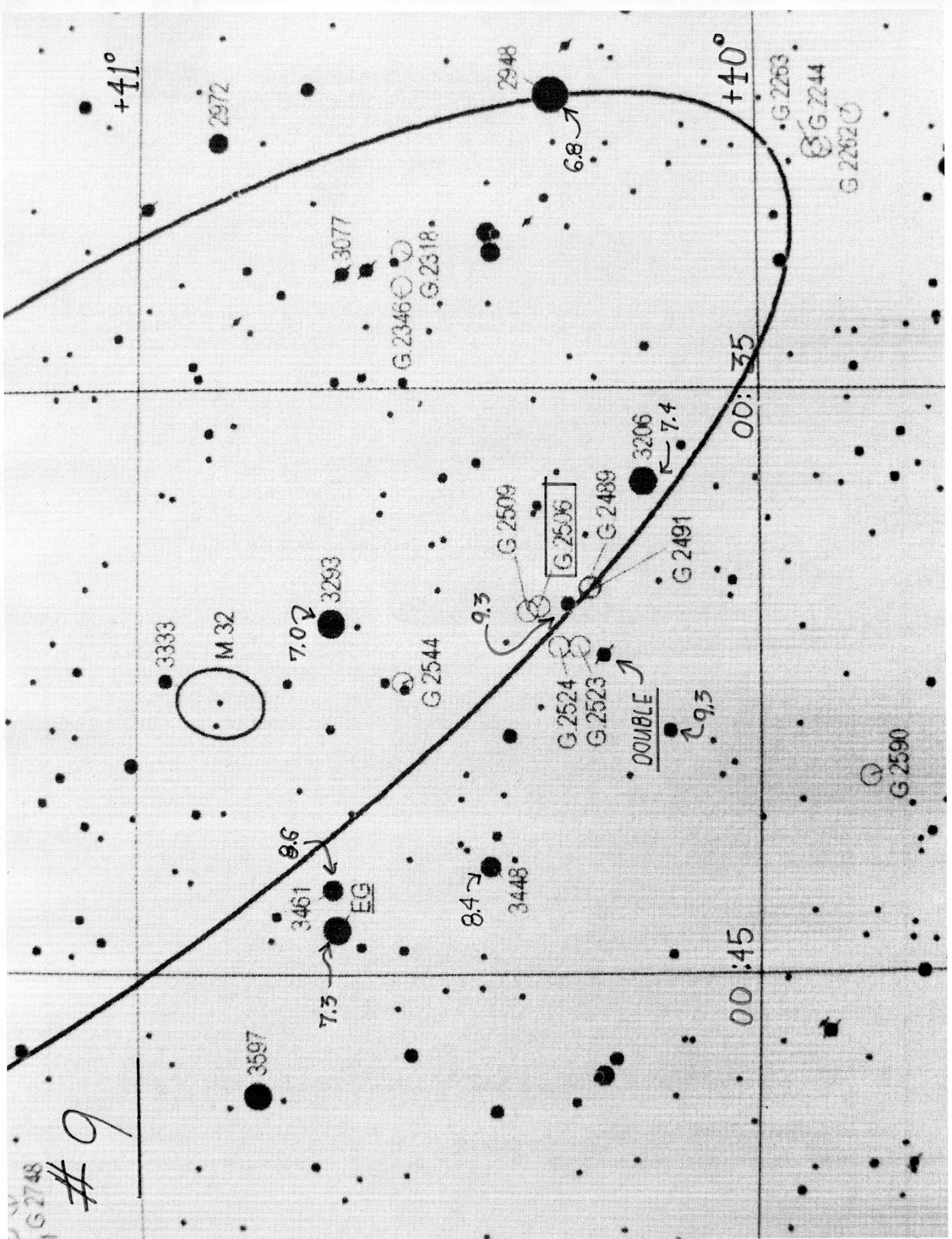
We hope you have enjoyed the first 10 years and the adventure this list has provided for you.

Thank you from Kreig and Tom.

: -)

G 2748

#9



+41°

+40°

00:35

00:45

2972

2948

G 2263

G 2244

G 2262

3077

G 2346

G 2318

3333

M 32

7.0

3293

G 2544

G 2509

G 2506

G 2489

3206

7.4

G 2491

G 2524

G 2523

DOUBLE

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3461

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3597

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G 2524

G 2523

DOUBLE

9.3

# 11

10.9 •

10 → •

11 → •

13.2 → •

• 11.9

9.3 → •

G-73 → •

• 11.3

12.1 → •

• 11.1

• 12.5

• ↖ 14

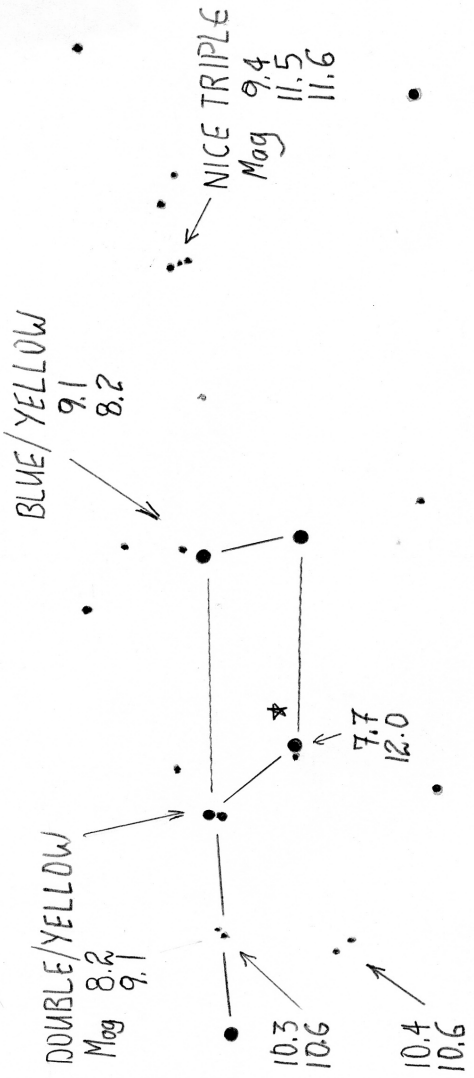
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#13

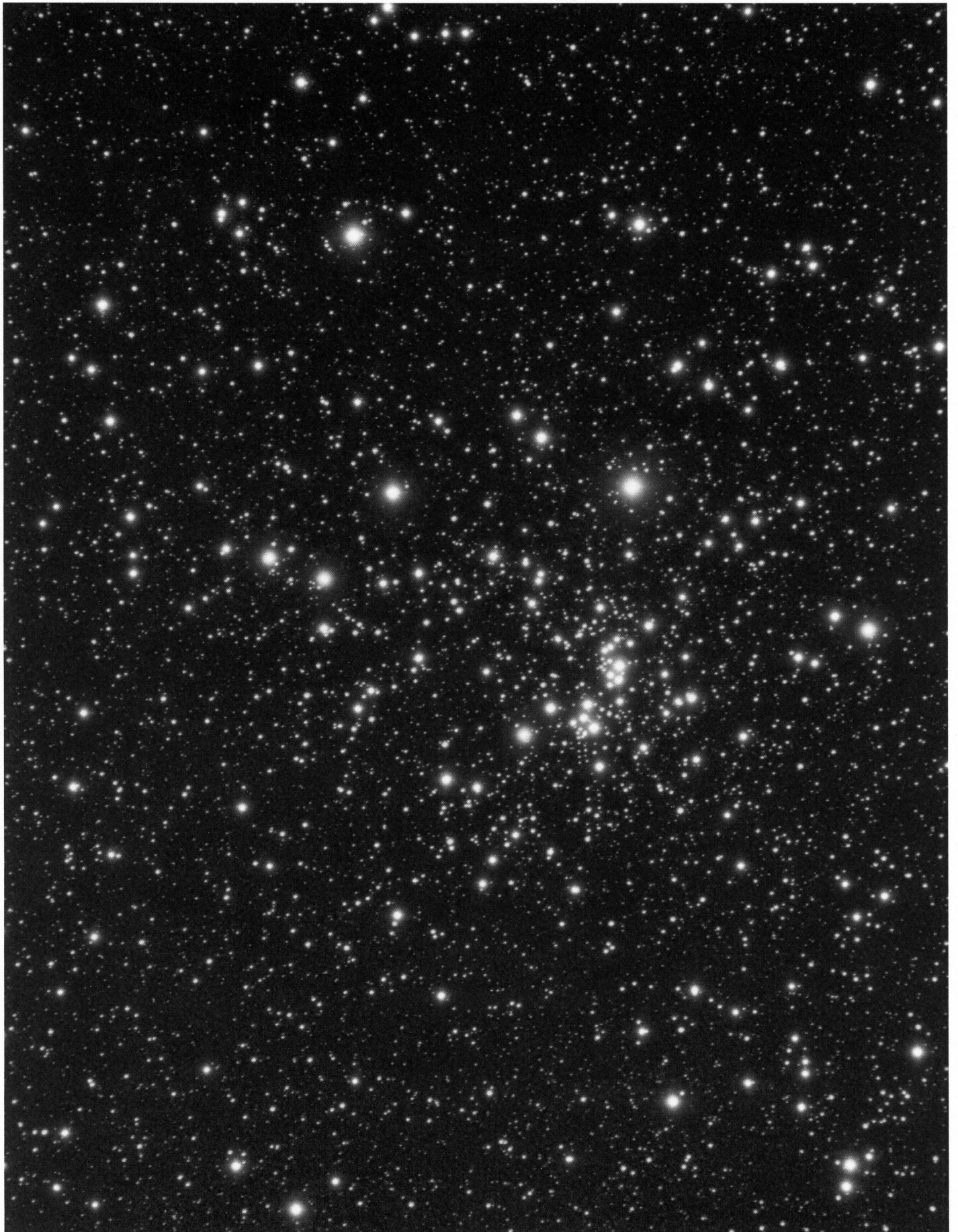


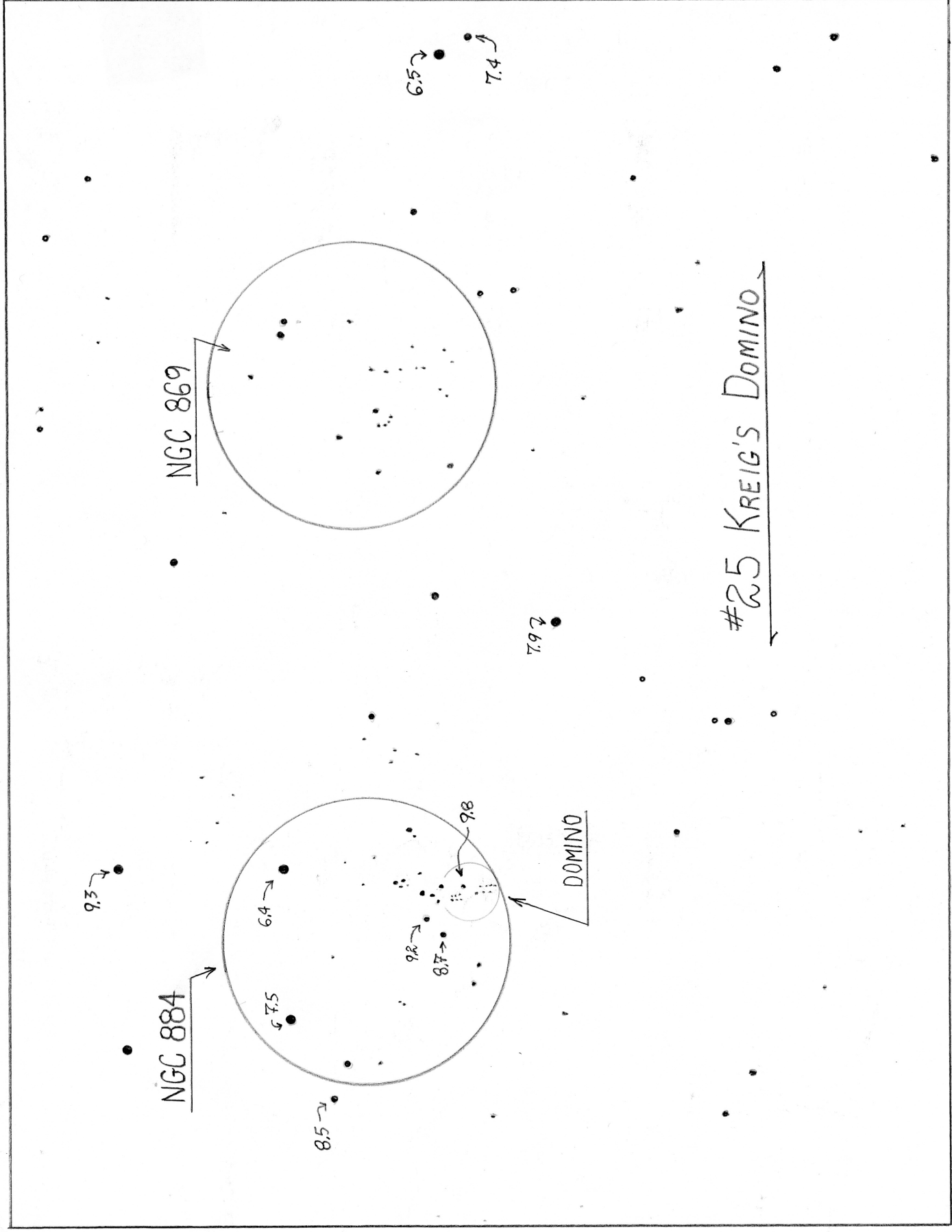
M-ANDROMEDA

ε 67

★ 00H 54min 17sec  
+39° 04'







NGC 884

NGC 869

DOMINO

#25 KREIG'S DOMINO

9.3

6.4

7.5

8.5

9.2

8.7

9.8

6.5

7.4

7.9

#26

9.2

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12

12

10.4

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7326

USNOA2 1200-19342935

7331

7336

7335

7337

7340

#28

ε CASS  
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54

7.8

NGC 147

NGC 185

o CASS  
4.5

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88

NGC 278

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#30

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NGC 205 →

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11.5 — •

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• -16.3

USNA02 —

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• -15.5

• -14.1

• -13.4