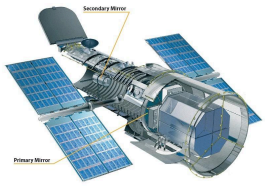
Hubble Space Telescope - Night Sky Challenge

March 2025

Participant Packet



Welcome to the Nurture Nature Center

At the NNC, science, art, and community involvement converge to make incredible things happen!

NNC was founded in 2007 as a center for flood education and community outreach. Today, we provide a wide range of community programs including many with a focus on science and art. Refer to our website for more and current information and news about the NNC: **www.nurturenaturecenter.org**

One of the many unique opportunities available at NNC is the Science on a Sphere (SOS), a large, suspended globe that displays a variety of earth and space visualizations. We use the SOS to educate about our solar system and the field of astronomy, along with regular 'star parties' in the Easton community where we provide telescopes and staff to guide visitors in viewing the night sky. NNC is excited to expand its education and outreach programming through the 2025 Hubble Space Telescope Observation Challenge: a year-long effort to connect people to space, exploration, and wonder.

Join us on the first Saturday each month at NNC from 4 to 5 pm. We invite fellow sky-gazers (*of all levels and ages*) as we delve into the scientific discoveries of some of the universe's most beautiful views. Participants will be equipped with knowledge, tools, and strategies required to participate in the Hubble Space Telescope Night Sky Challenge.

Each month, a new list of targets will be provided. These objects are selected through a partnership between NASA and the Astronomical League. The NNC will provide information and instruction to make your participation in the challenge both enjoyable and rewarding. Those participating will be eligible for recognition and awards.

It is our hope that this opportunity will provide you with a greater appreciation for our Earth as we stargaze each month. The following pages contain many helpful resources to help us on our journey together. Instructions and additional resources will be provided during each monthly program. No matter your age or ability level, we will navigate the night sky together. We will learn together. We will discover new things together. And together we will grow as a community, using Hubble to help guide us along the way!

This packet contains information from NASA, the Astronomical League, and other resources online.

Helpful Links to Explore:

- *Nurture Nature Center (NNC) Hubble Challenge (Packets, Videos, and Resources):* *https://www.nurturenaturecenter.org/hubbles-night-sky-observing-challenge-with-nnc/*

- *NASA "What's Up"*: https://science.nasa.gov/skywatching/whats-up/

- *NASA Hubble Challenge Monthly Objects Image Link*: https://science.nasa.gov/mission/hubble/science/explore-the-night-sky/hubbles-night-sky-challenge/

- *Sky and Telescope Star Chart*: https://skyandtelescope.org/interactive-sky-chart/

- *Dark Sky Map*: https://www.darkskymap.com/nightSkyBrightness

- *Dark Skies Link*: https://www.go-astronomy.com/dark-sky-parks-stargazing-state.php?State=PA

- ***FUN*** *NASA Online Hubble Activities*: https://science.nasa.gov/mission/hubble/multimedia/online-activities/

- Astronomical League List of Other Observation Challenges: https://www.astroleague.org/alphabeticobserving/

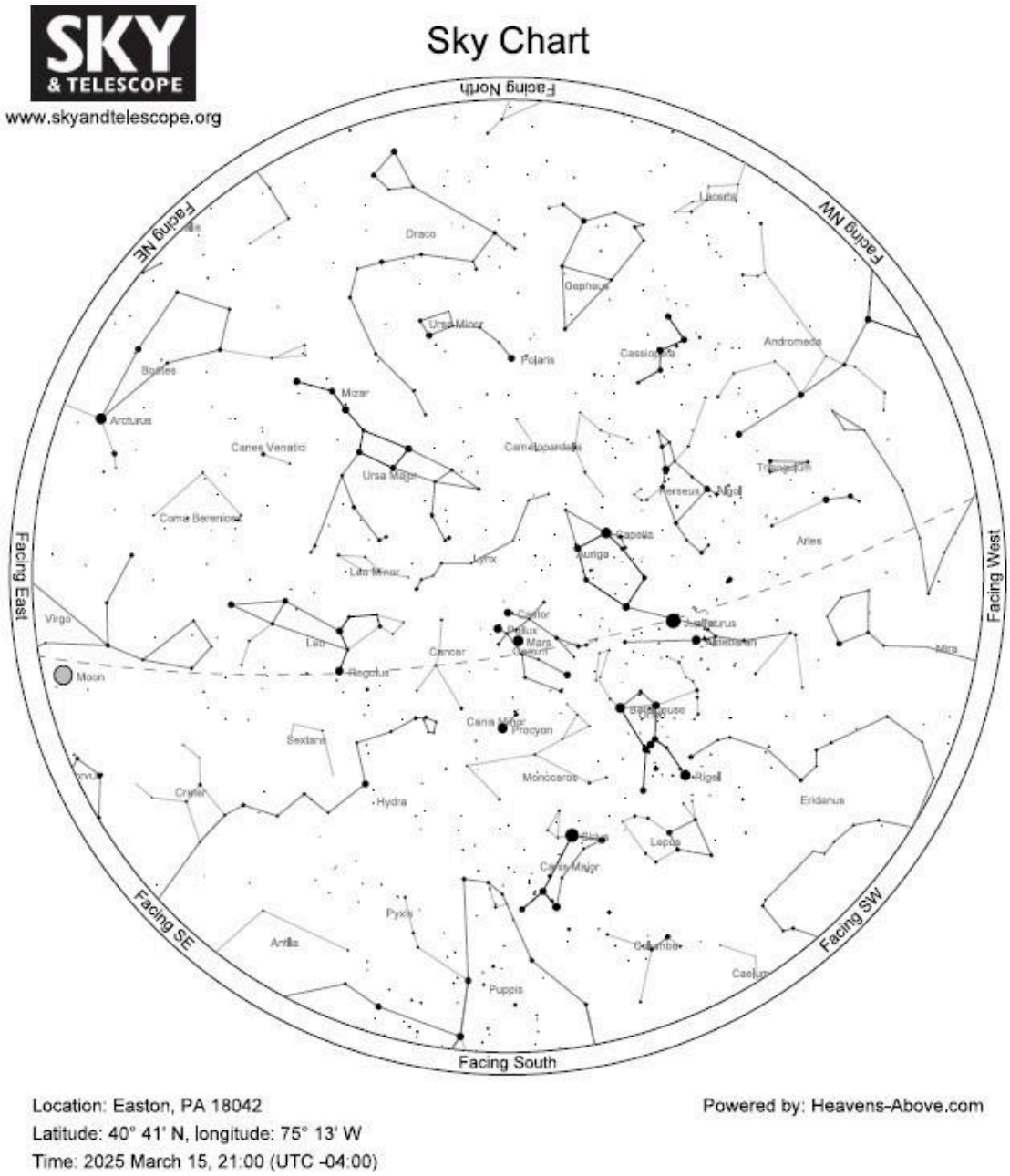
- NASA's ***Citizen Science*** Projects: https://science.nasa.gov/citizen-science/

Useful Resources in this Packet:

- Monthly Sky Charts (general and detailed)
- Monthly Hubble Objects (*descriptions and sky maps from NASA*)
- Journal Observation Form (*optional for recognition*)

Additional information and instruction will be provided during the monthly program on the 1st Saturday of each month at NNC from 4 to 5pm.

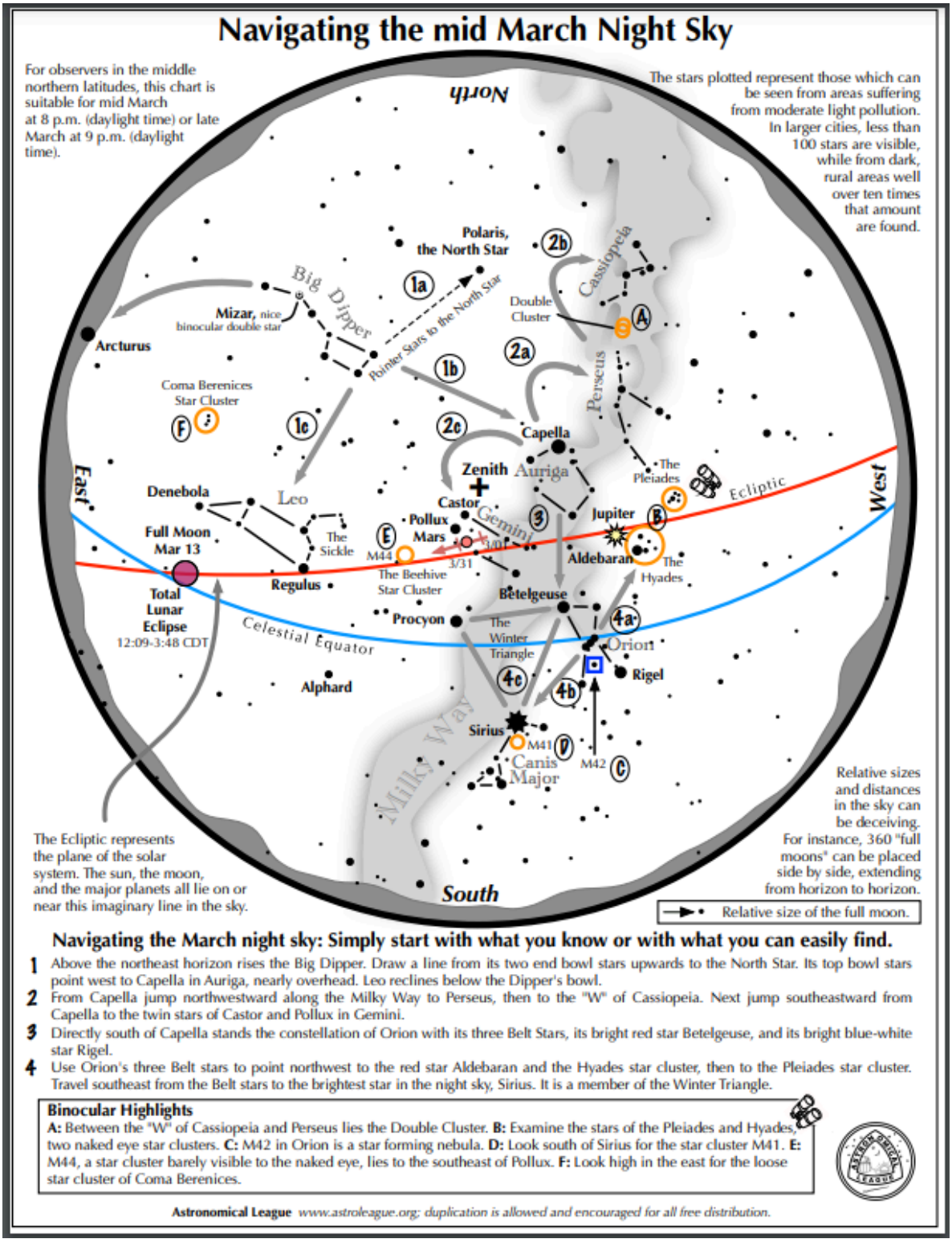
General Sky Chart for March



Location: Easton, PA 18042
Latitude: 40° 41' N, longitude: 75° 13' W
Time: 2025 March 15, 21:00 (UTC -04:00)

Powered by: Heavens-Above.com

https://skyandtelescope.org/interactive-sky-chart/

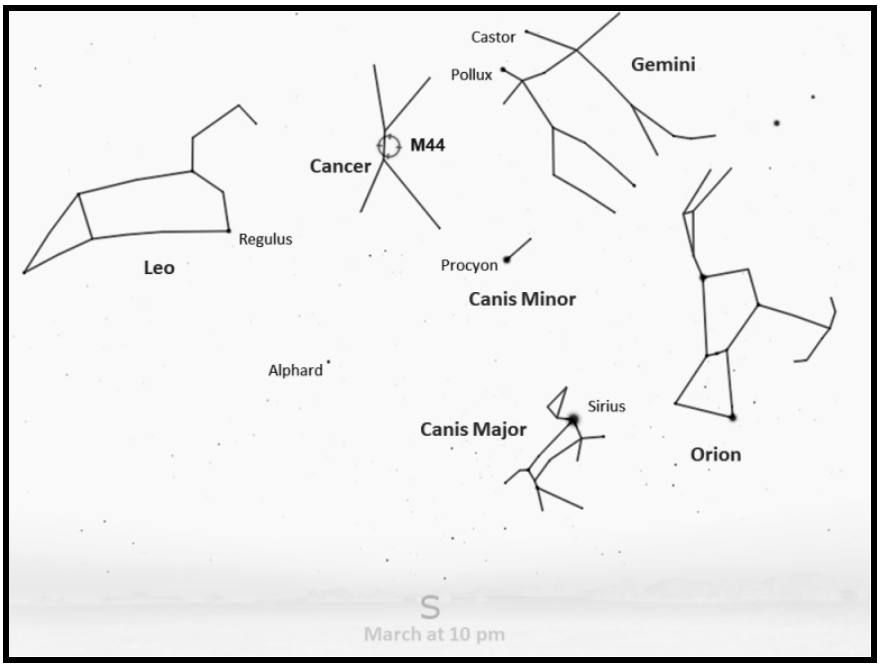


https://www.astroleague.org/wp-content/uploads/2025/02/2025-March.pdf

Messier 44
The Beehive Cluster

This open cluster of about 1,000 stars is one of the closest to Earth. It was first seen, as more than just a cloudy nebula, by Galileo. The Hubble image here also captures galaxies far beyond the cluster itself.

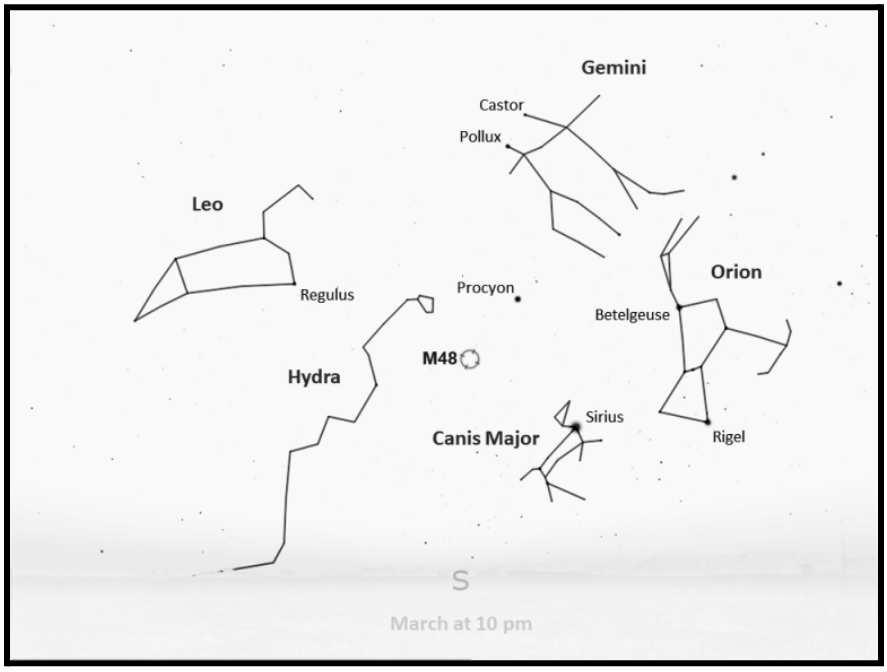
Distance: 600 light-years
Apparent Magnitude: 3.7
Constellation: Cancer
Object type: Open Cluster



Messier 48
The Beehive Cluster

About 50 stars are visible with binoculars. This cluster was first noted by Messier in 1771, but catalogued in the wrong position. As a result, it was "lost" for years. His daughter found it a dozen years later and catalogued it correctly.

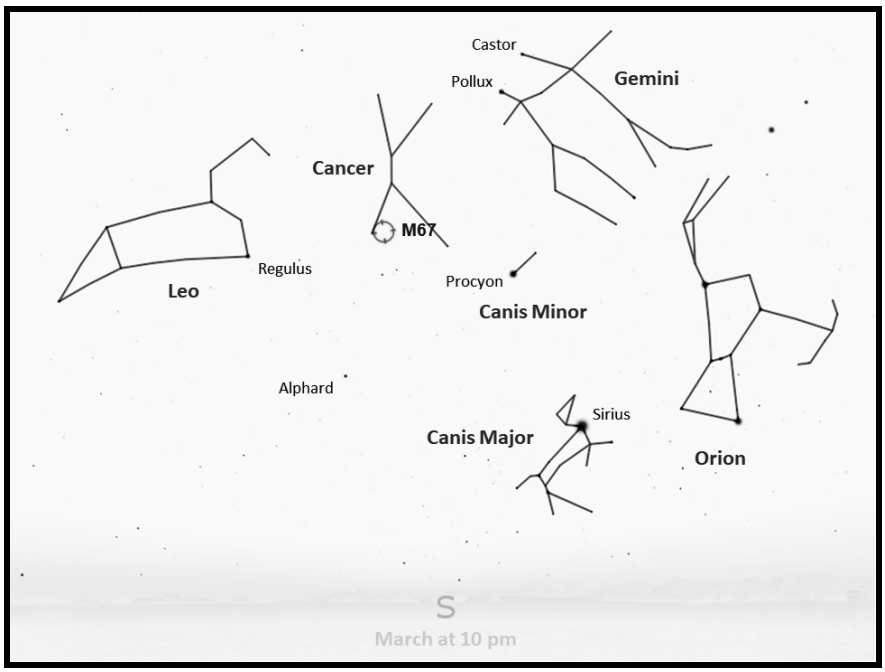
Distance: 2,500 light-years
Apparent Magnitude: 5.5
Constellation: Hydra
Object type: Open Cluster



Messier 67
King Cobra Cluster or
Golden Eye Cluster

This open cluster of over 500 stars is loosely held together by gravity. It's about the same age as our Sun and contains about 100 stars very similar to our own. It also contains about 30 "blue straggler" stars and is unusually located nearly 1,500 light years above the plane of the Milky Way galaxy. Most are found along the central plane.

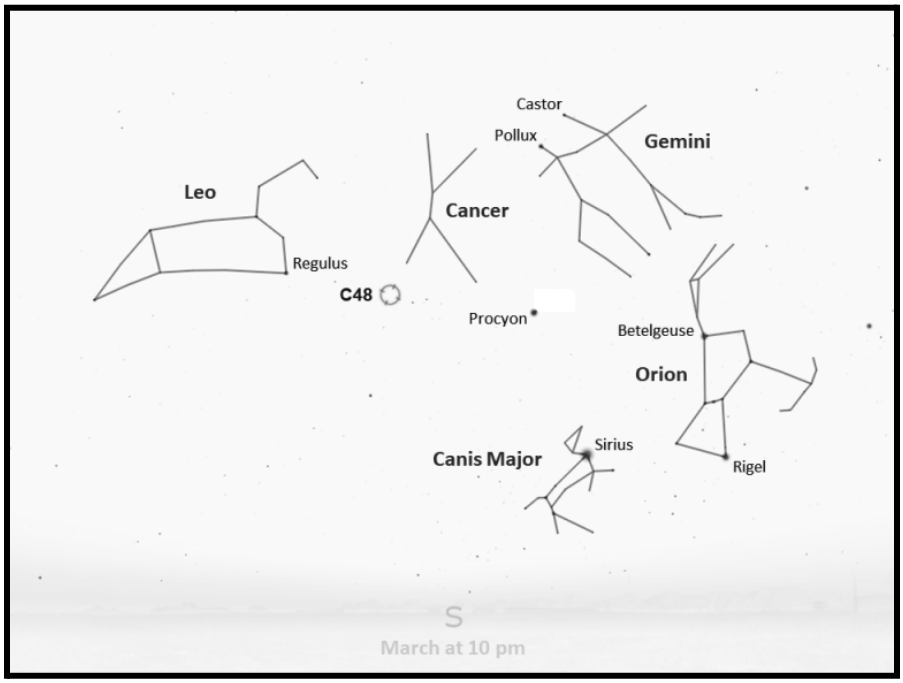
Distance: ~2,800 light-years
Apparent Magnitude: 6.1
Constellation: Cancer
Object type: Open Cluster



Caldwell 48
Spiral Galaxy

This spiral galaxy has a large, yellowish, central bulge filled with old stars. The younger stars in the spiral arms have been studied to understand star formation. Although the spiral arms are very difficult to see, this Hubble image combines visible, infrared, and ultralight observations to make them visible.

Distance: 67 million light-years
Apparent Magnitude: 11.0
Constellation: Cancer
Object type: Spiral Galaxy



Hubble Night Sky Challenge

Official Journal Entry Rules

To earn a certificate, you need to meet these requirements:

- ***Complete*** a ***Journal Entry*** including your sketch or image of the Hubble object(s)
- ***Describe*** the parts of your observation that are recognizable in the Hubble image
- ***Submit*** your ***Journal Entry*** before the deadline (to the NNC or Astronomical League)

You can ***submit***, ***in person***, at the ***Nurture Nature Center*** during the monthly Hubble Program **OR *email*** it to Henry Skirbst: henry@nurturenaturecenter.org prior to the deadline.

If you wish, you can also submit your Journal Entry directly to Richard Benson.

NASA Observing Challenge and Special Award Coordinator:
Richard Benson (*of the Astronomical League*)
3105 Lykes Dr. NE
Albuquerque, NM 87110
E-mail: rlbenson6691@comcast.net

Recognition certificates will be emailed to you from Richard Benson within a month.

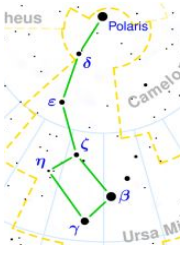
Use the information below to help you complete your Journal Entry:

Seeing: ***How stable is the sky?***

E *(excellent)* – The *brighter stars* are *not twinkling* at all.
VG *(very good)* – The *stars* are *twinkling slightly*, but the brighter *planets* are *not twinkling*.
G *(good)* – The *brighter planets* are *twinkling slightly*.
F *(fair)* – The *brighter planets* are *obviously twinkling*.
P *(poor)* – The atmosphere is *turbulent*. *All objects are twinkling* to the points where observation is not practical.

Transparency: ***How clear is the sky?***

Transparency is a measure of what you can see in the nighttime sky in spite of dust, smoke, haze, humidity, or light pollution. An easy way to measure this is to use the magnitude of the faintest star you can see. In the northern hemisphere, to make life simpler, you can use the *Little Dipper (Ursa Minor*) if you can see it. Here is the scale (*based on the visible stars*):

No stars visible		Magnitude **1**	
Only Polaris is visible	α	Magnitude **2**	
… ***plus*** Kochab ***or*** Pherkad	β, γ	Magnitude **3**	
… ***plus any stars in the tail***	δ (Yildun), ε	Magnitude **4**	
… ***plus another bowl star***	ζ	Magnitude **5**	
All 7 stars are visible	η	Magnitude **6**	
More than 7 stars visible		Magnitude **7**	

What makes a good ***Description*** when you are filling in an ***Observation Log*** for an Astronomical League Observing Program? These are some suggestions and guidelines to help you. The reason for the object description requirement is to help the observer to become a more detail-oriented observer; to "observe" the object and not just "see" it, and in the end, to become a better observer. You cannot learn to "observe" from a book. It can only be mastered with an eyeball to the eyepiece. The intent of requiring object descriptions is to have you pick out details to the best of your ability. These details are what make the object unique.

The description should describe what makes that object different from all the rest. This is possible with any size optical instrument. You can't say that M70 looks like M13 even though both are globular clusters. You wouldn't describe the Great Orion Nebula (M42) the same as the Crab Nebula (M1), even if they both are nebulae and appear as fuzzy clouds in the eyepiece. M31 looks nothing like M65 even though both are spiral galaxies seen at a fairly similar angle.

Things like:

Is the object *round*, *oval*, or *irregularly* shaped?

If the object is oval shaped, *how stretched out*, or oval, is it; i.e. 2 times longer than wide, 4 times longer than wide, even more? Is it basically just a little streak?

Does the galaxy or nebula have *sharp edges*, or does it *fade gradually* away to nothing? If it fades away to nothing, does *averted vision* (*not looking directly at it*) seem to increase its size?

Does the *galaxy* have a *brighter core area*, or is it an *even brightness* across the entire surface? Is the brighter core a *large area*, or does it come to a *stellar point*?

For *globular clusters*, is the central area *large and full*, or *very pointed* and stellar-like?

For *open clusters*, are all the stars the *same magnitude?* Can you guess the *number of stars*?

Does the open cluster *stand out well* against the starry background, or does it *blend in* making it difficult to determine the edges?

For *nebulae*, are there any *denser* or *lighter* areas? Are there any stars involved in the nebula?

What else is in the field of view that is *interesting*? Other deep sky objects? A nice double star? Any colorful stars? Is the field of view densely packed with stars? Did a satellite just pass? etc.

And of course, any other thoughts you have while viewing the object that might *make it personal* to this observation. After all, this is YOUR observing log.

Yes, it may at times seem like a lot of work, but after a dozen or so observations, it will become second nature to ask yourself these things. The result is that you end up training your eyes to see detail in the objects you observe. And after doing this, each object becomes unique.

Thanks to Observing Program Coordinator, Scott Kranz, for developing this instructional aid.

Hubble Night Sky Challenge

Official Observation Journal Entry Form

Please complete as neatly as possible.

Group Affiliation:	*The Nurture Nature Center, 518 Northampton St., Easton, PA 18042*				
Your Full Name:					
Mailing Address:					
Phone Number:					
E-mail Address:					
Tools Used:	Eyes (**E**), Binoculars (**B**), Telescope (**T**)				
Location Method:	Manual (**M**), Device Aided (**DA**)				
Observation:	Visual (**V**), Imaging (**I**)				
Location:					
Date:		Time:			
Object Name:					
Catalogue ID:		Host Galaxy:			
Object Type:		Constellation:			
Magnitude:		Seeing:		Transparency:	
Instrument Used:				Magnification:	
Sketch / Image & Comparison	*https://science.nasa.gov/mission/hubble/science/explore-the-night-sky/hubbles-night-sky-challenge/*				