

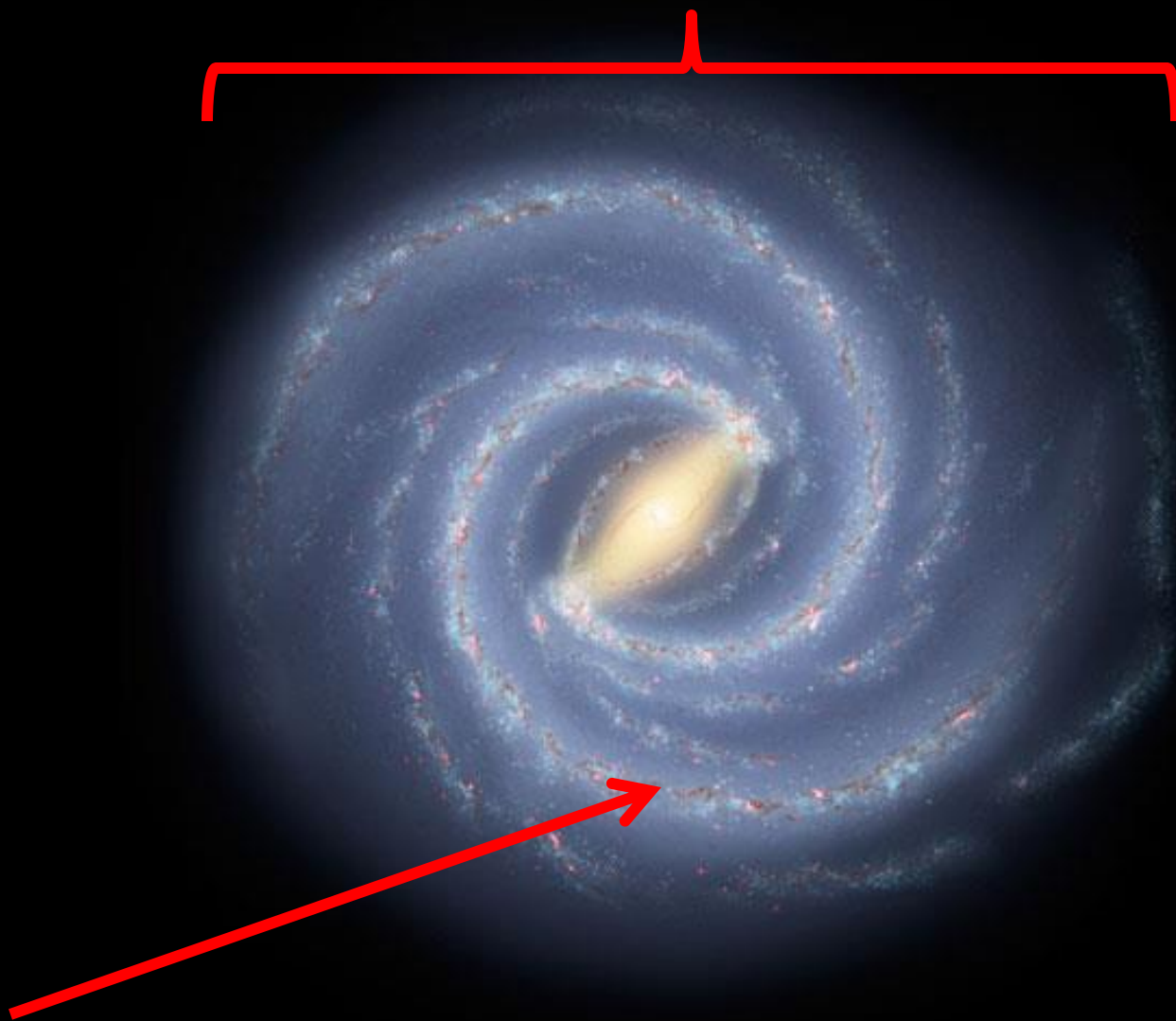


The Deep Sky

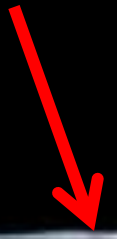
OLLI Week #6



100,000 light years



You are here!





“Double” Stars



- Line-of-sight
- Binary systems

Mizar & Alcor





Deneb

CYGNUS

Vega

LYRA

"The Summer Triangle"

Tarazed

Altair

Alshain
(Beta)

AQUILA

Eta

South

Albireo (“Hen’s Beak”)

Double Stars – Binary Star Systems, All Photos - Celestron 6SE, CG5 Mount, 60 secs Exposure, ISO 1600, Canon 550D



Star: 17 Cygni, Constellation: Cygnus



Star: 61 Cygni, Constellation: Cygnus



Star: 94 Aquarii, Constellation: Aquarius



Star: Tau1 Aquarii, Constellation: Aquarius



Star: 107 Aquarii, Constellation: Aquarius



Star: Albiero, Constellation: Cygnus



Name: Epsilon Cygni, Constellation: Cygnus



Name: Eta Cass, Constellation: Cassiopeia



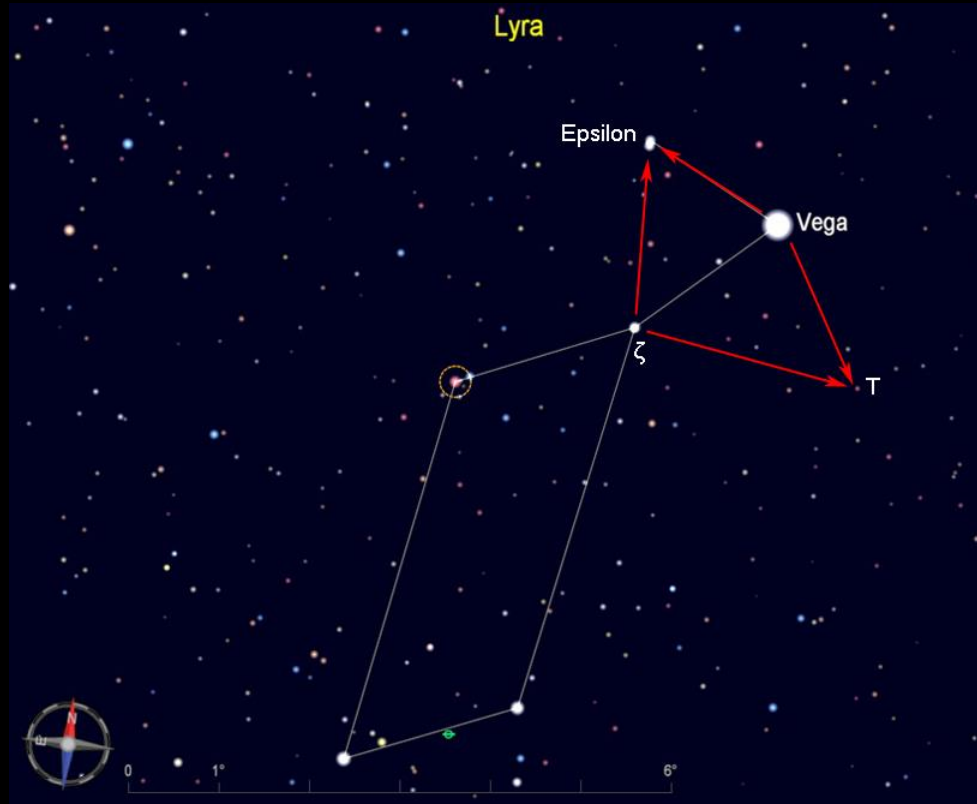
Name: Polaris, Constellation: Ursa Minor

Listing: Mizar

- Greek designation: Zeta (ζ) Ursae Majoris
- Position: 13h, 21.9m +55°11'
- Magnitudes: 2.40, 4.00
- Separation: 14.4''



Epsilon Lyrae (“Double Double”)





SKY
MAGAZINE

STARGAZING SERIES

double stars

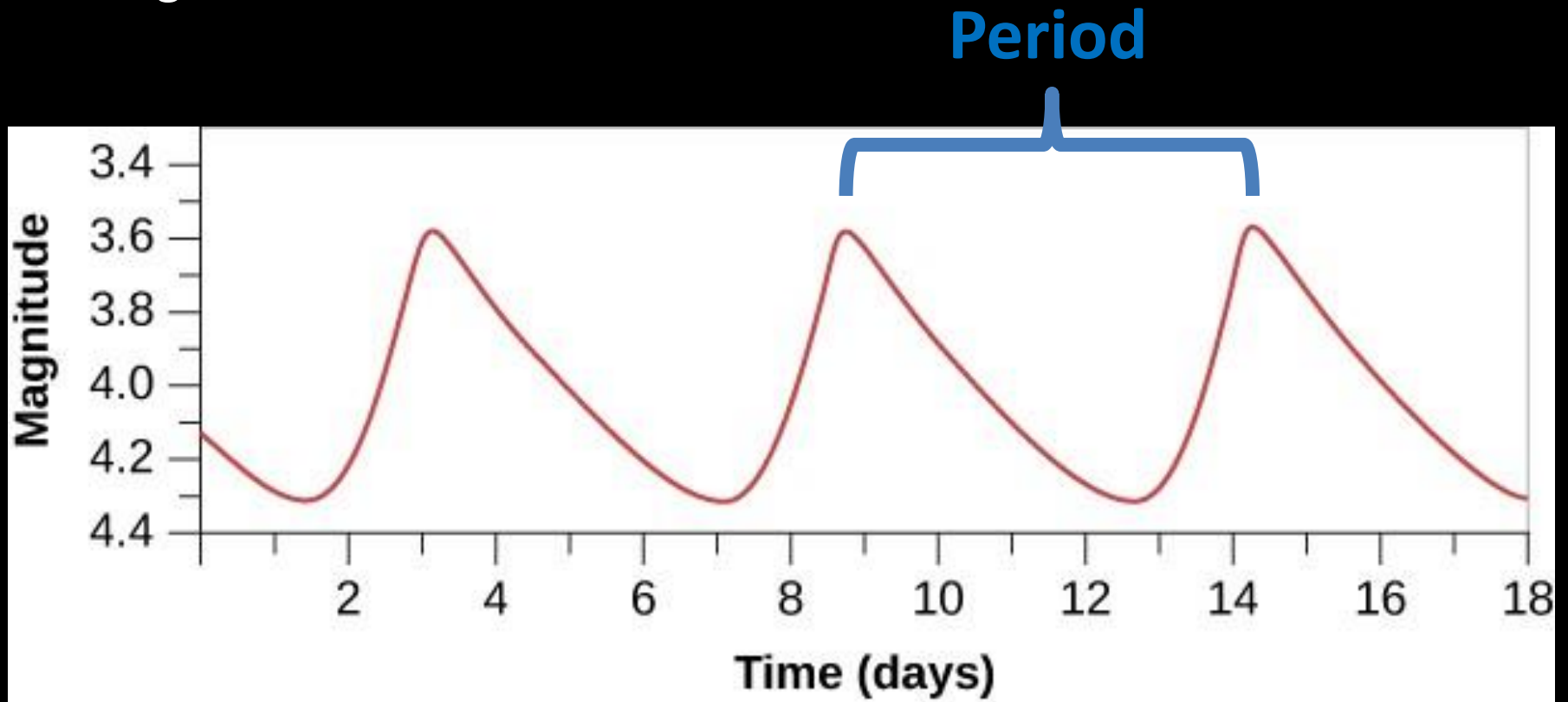
for small telescopes

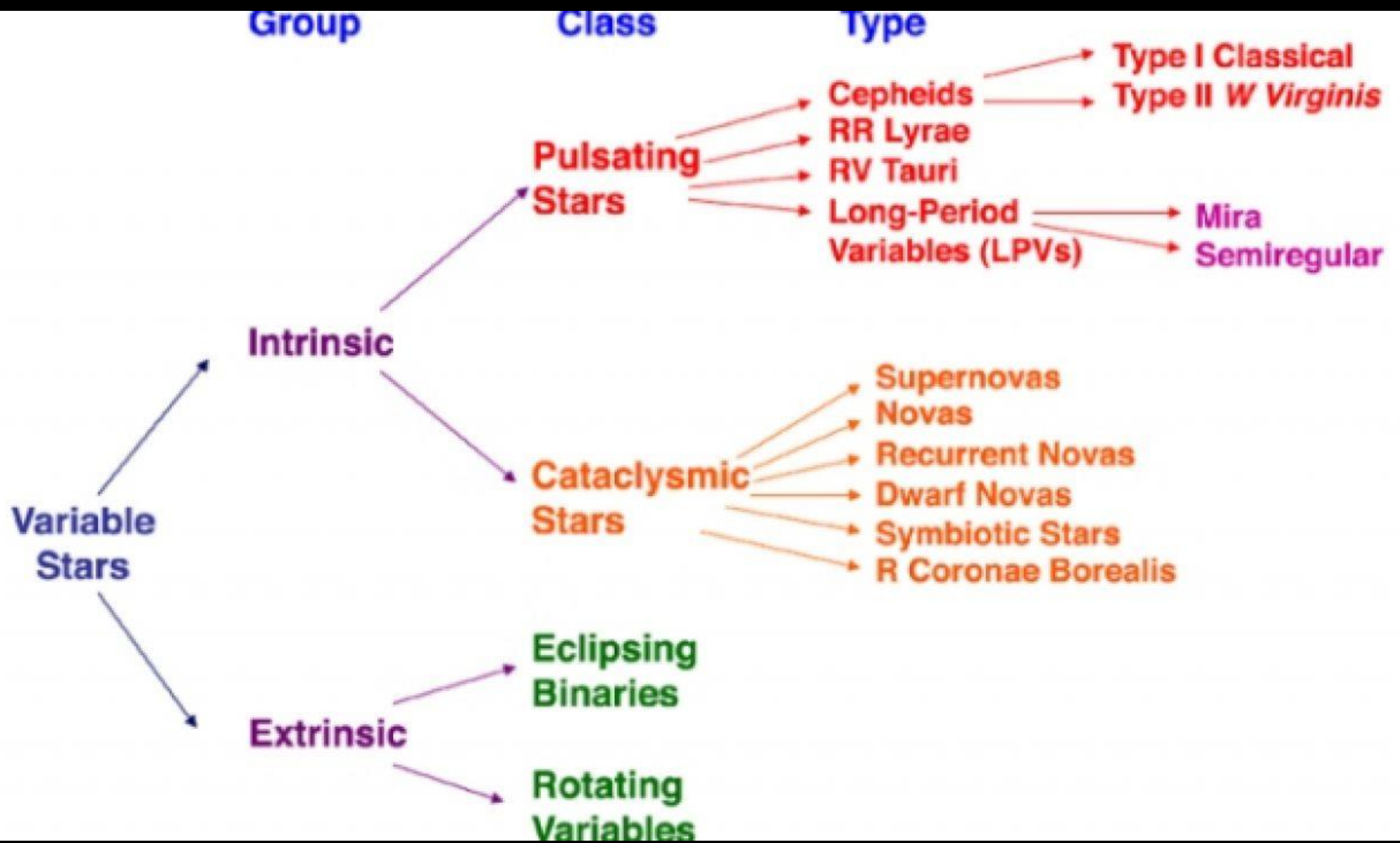
MORE THAN
2,100 STELLAR GEMS
— BACKYARD OBSERVERS

by **SISSY HAAS**

Variable Stars

- “Light Curve”





EG Cep

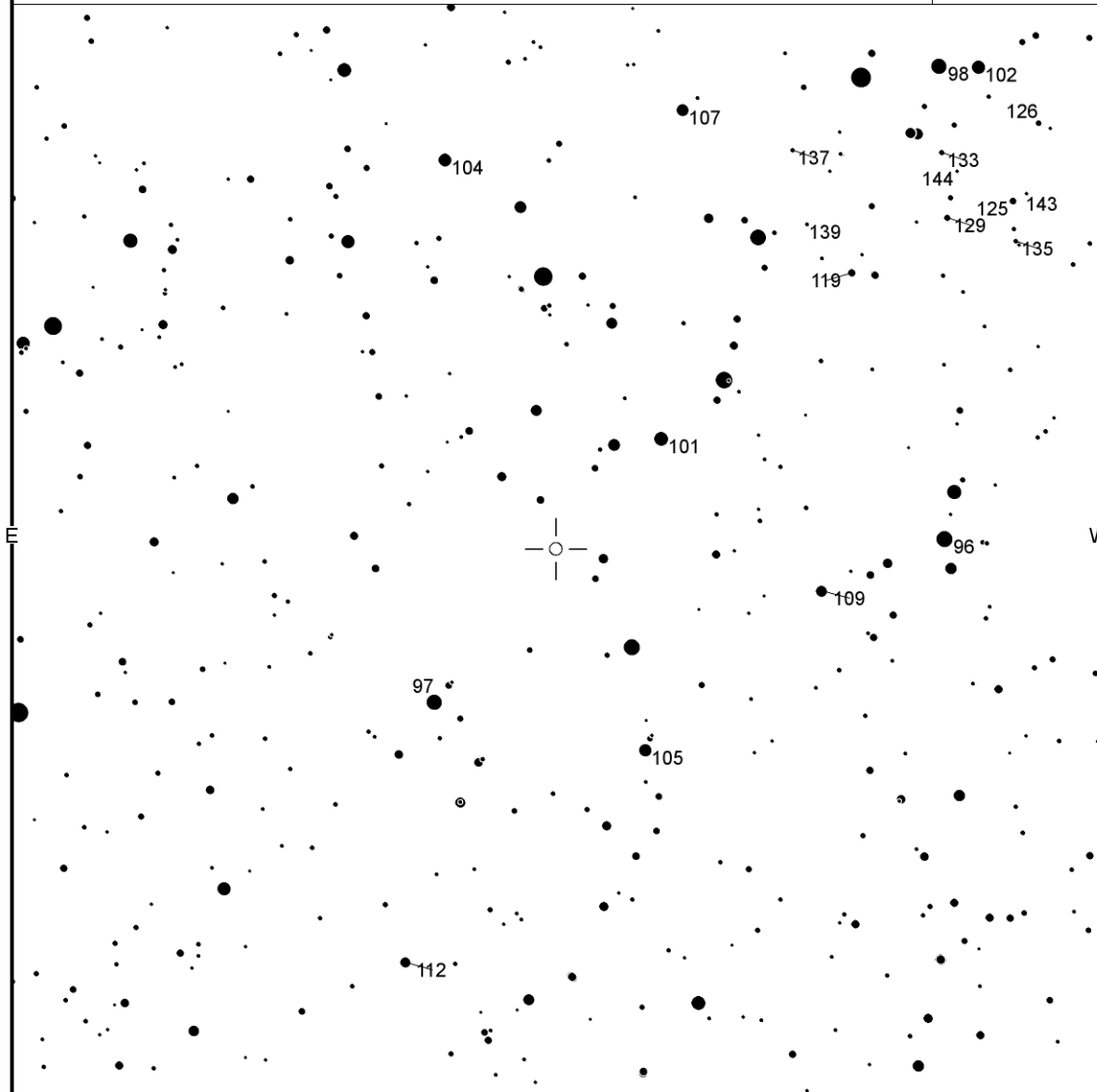
Magn: 9.31 - 10.21 V
Period: 0.54462183
Type: EB
Spec: A3

EG Cep

(2000) 20:15:56.83 +76:48:35.8

AAVSO
Chart

X17056NK



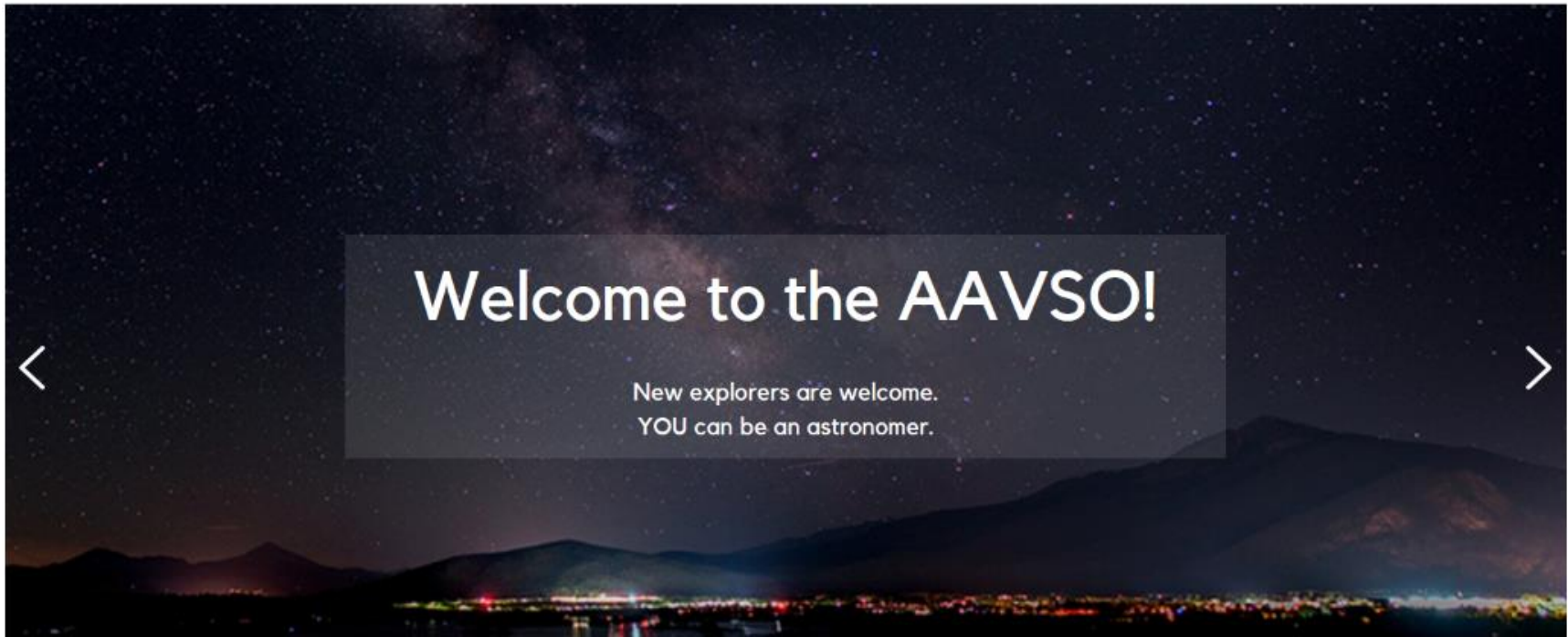
Please use the photometry table for CCD observations.



Enter the terms you wish to search for. [Login](#)   0 items

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- [Getting Started](#) ▾
- [Community](#) ▾
- [Get Involved](#) ▾
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www.aavso.org

Star Clusters

- Open (Galactic) Clusters
- Globular Clusters
- Associations



Pleiades



Moon (x4)

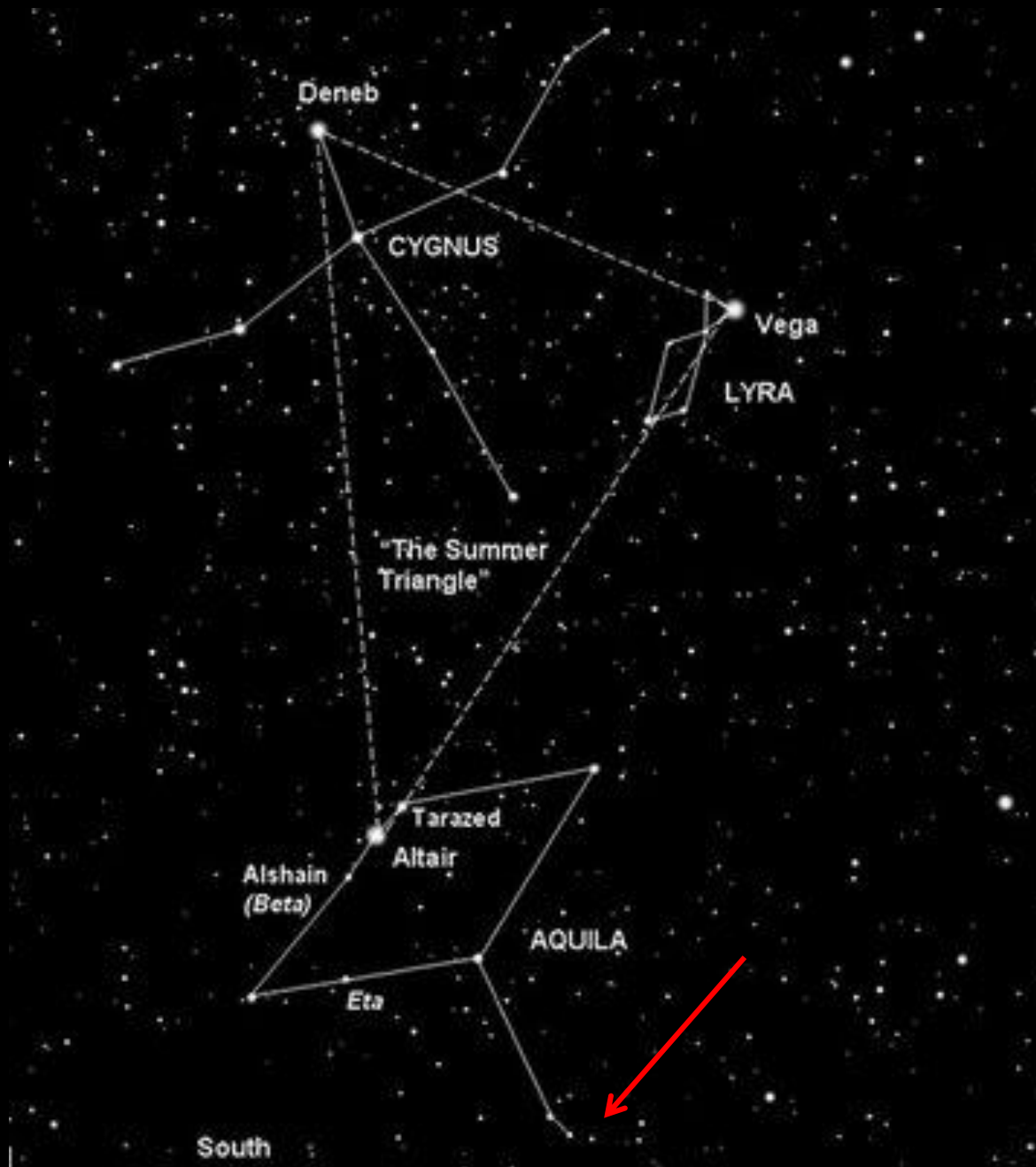


Hyades



A star chart of the constellation Aldebaran. The chart features a grid of stars, with the name "Aldebaran" written in white text. The stars are arranged in a pattern that resembles a large, irregular shape. The background is a dark, star-filled field. The name "Aldebaran" is positioned in the lower-left quadrant of the chart.

Aldebaran



“Wild Duck Cluster” (M11)(Scutum)



M38 (Auriga)



“Double Cluster” (Perseus)



M13 (Hercules)

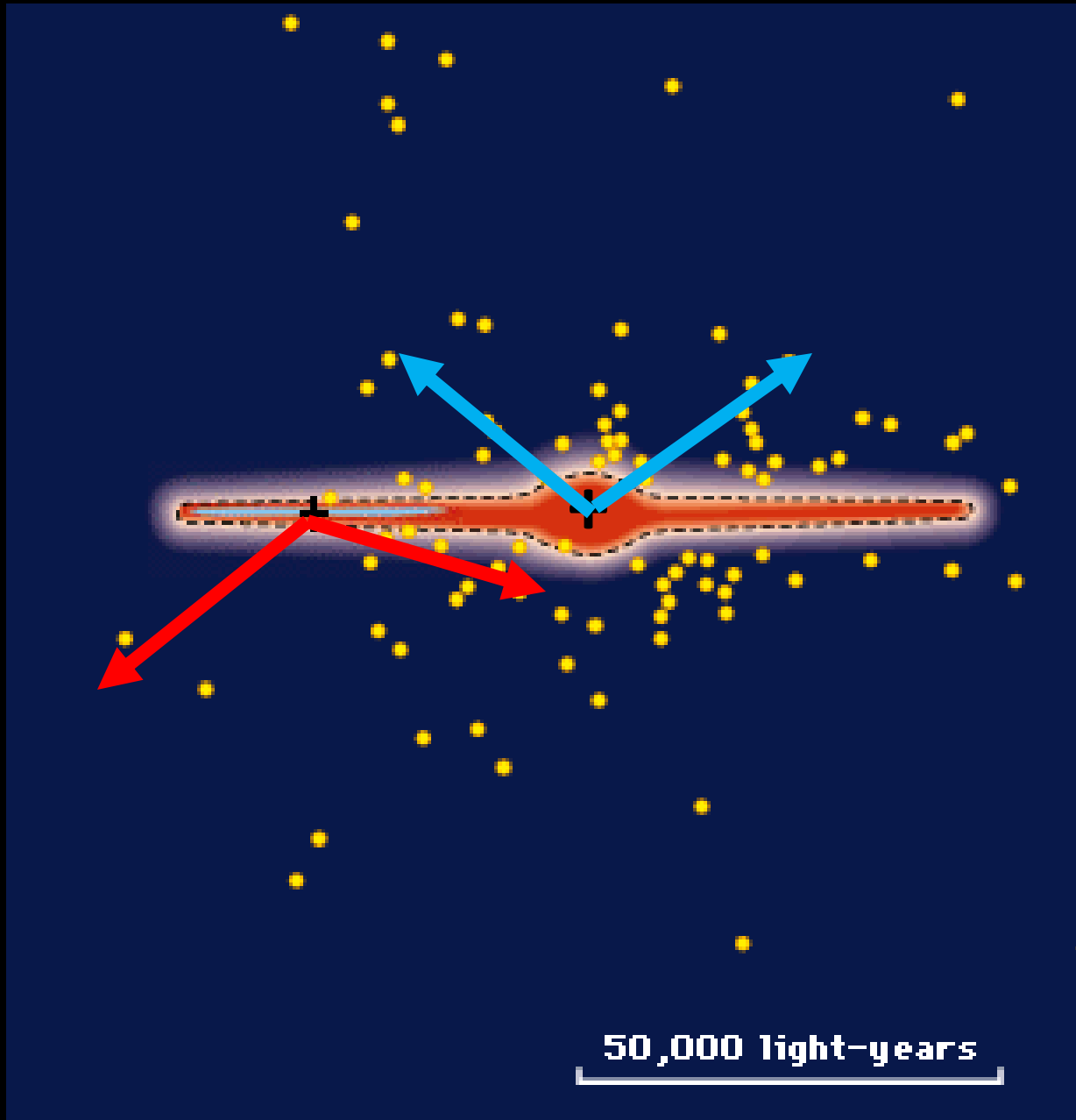


M5 (Serpens)



M22 (Sagittarius)





Summer sky



Alph
Asso

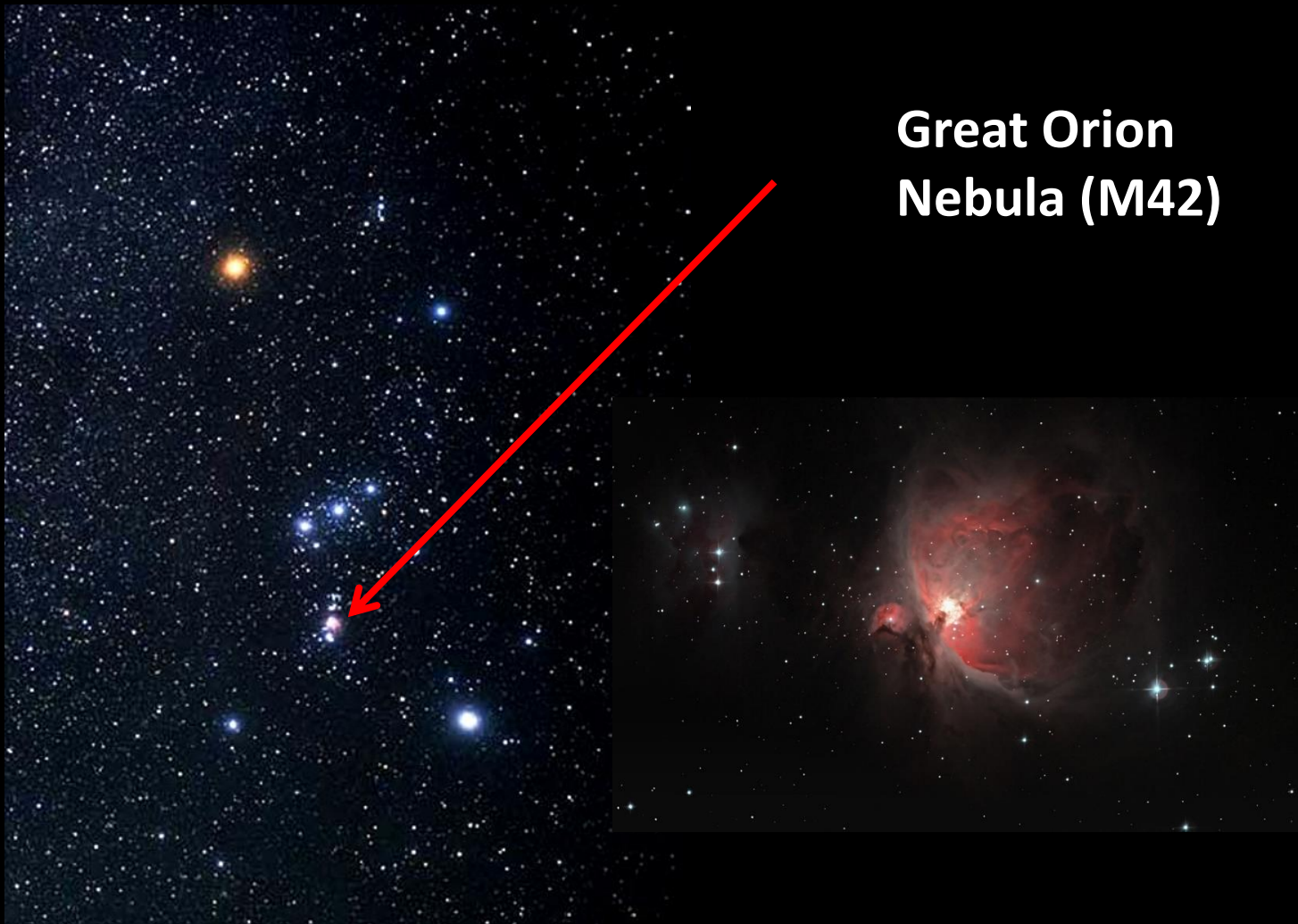


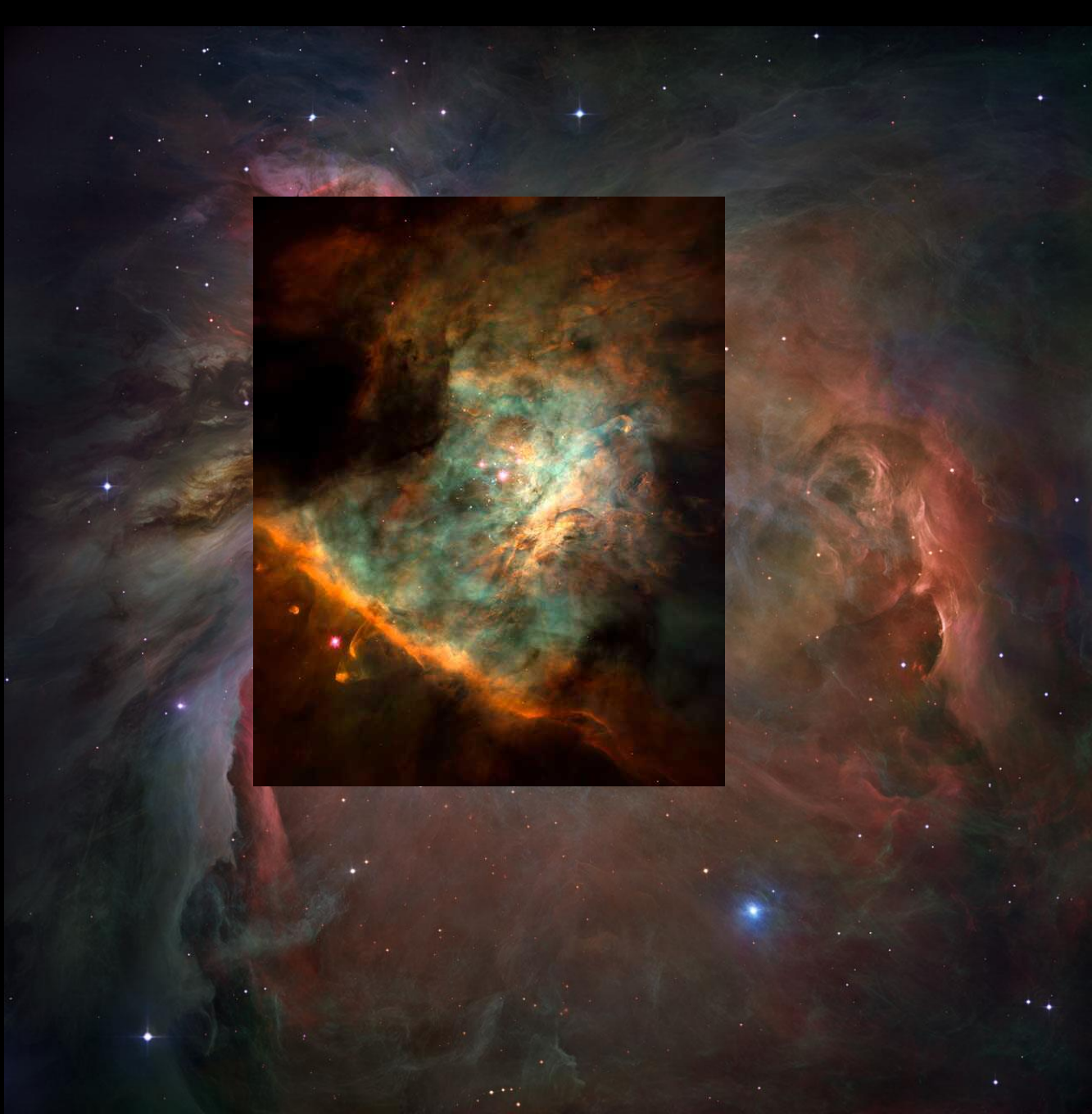
Nebula – “cloud or mist”

- Emission (reddish)
- Reflection (bluish)
- Dark (seen in silhouette)
- “Planetary”
- Supernovae remnant



**Great Orion
Nebula (M42)**





**Lagoon
Nebula
(M8)**



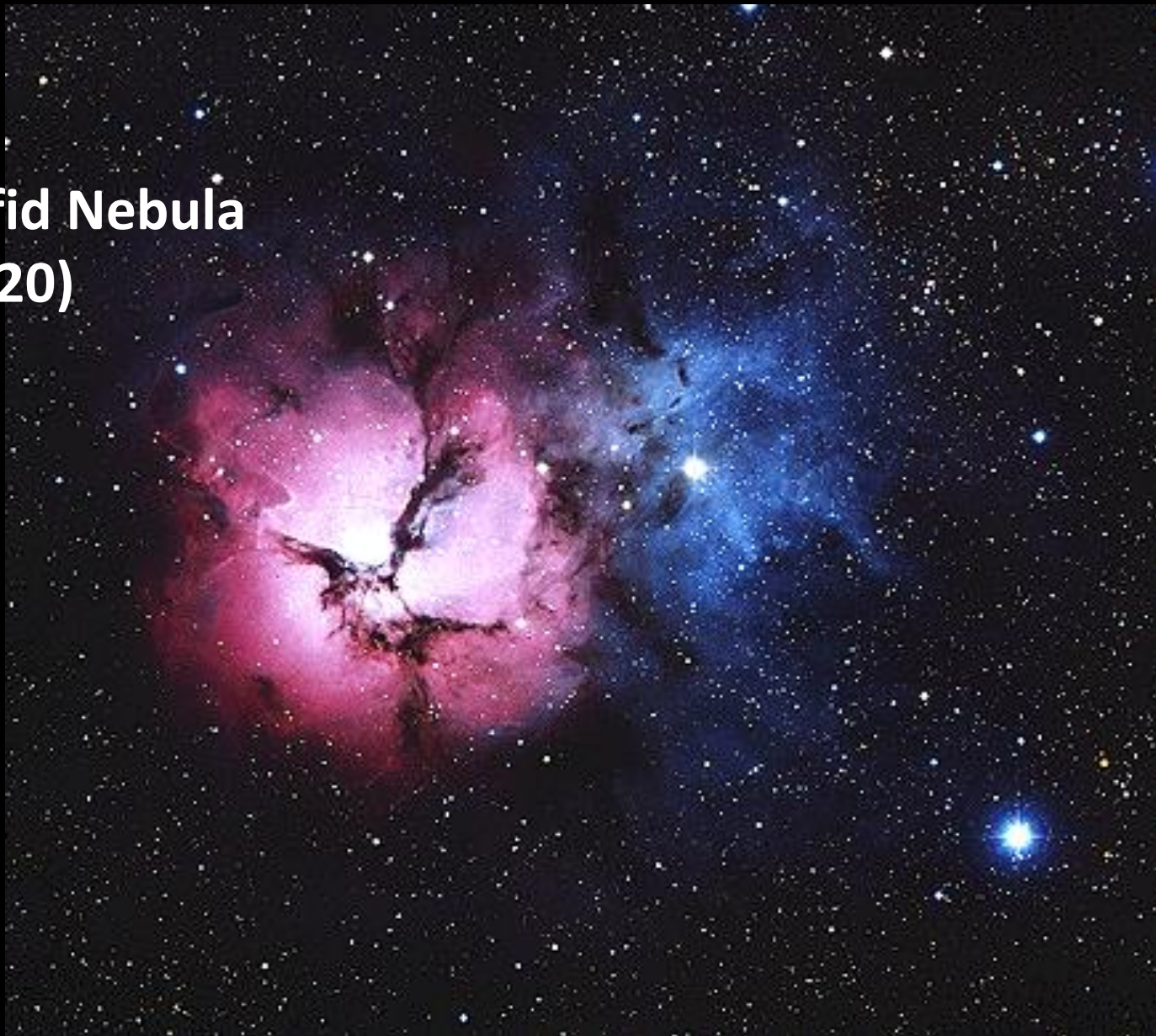


**North
American
Nebula
(NGC 7000)**

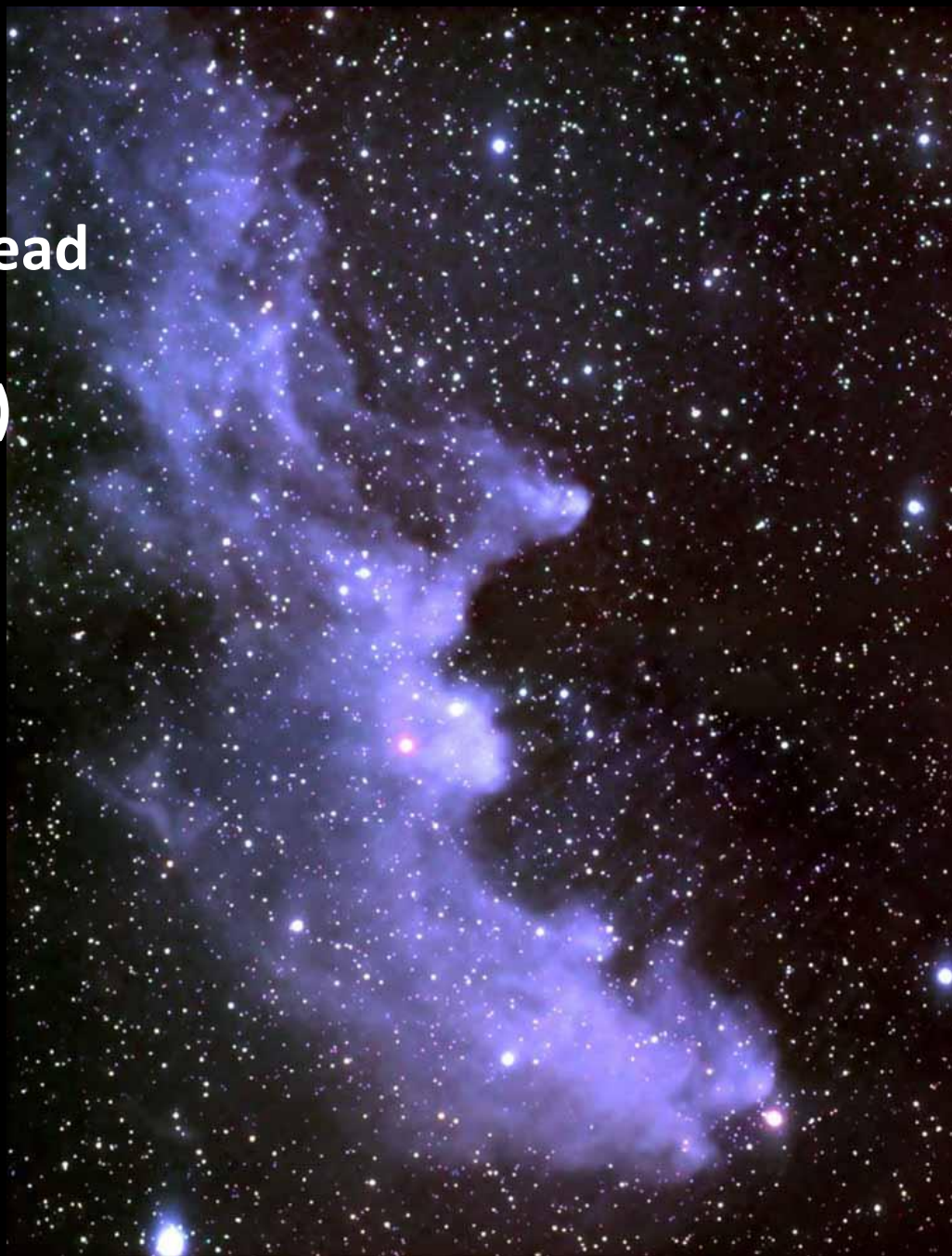
**Rosette
Nebula
(NGC 2244)**



**Trifid Nebula
(M20)**

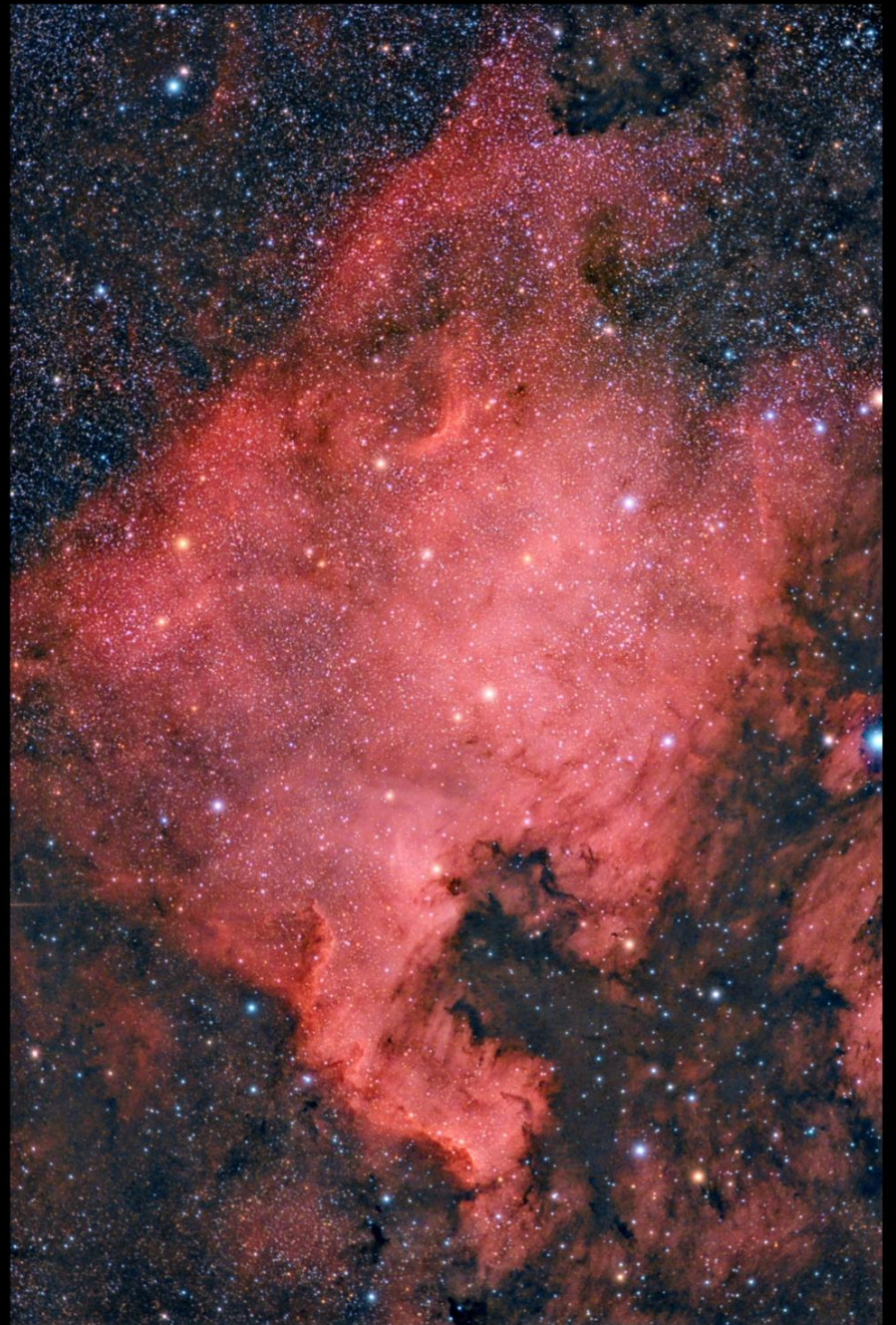


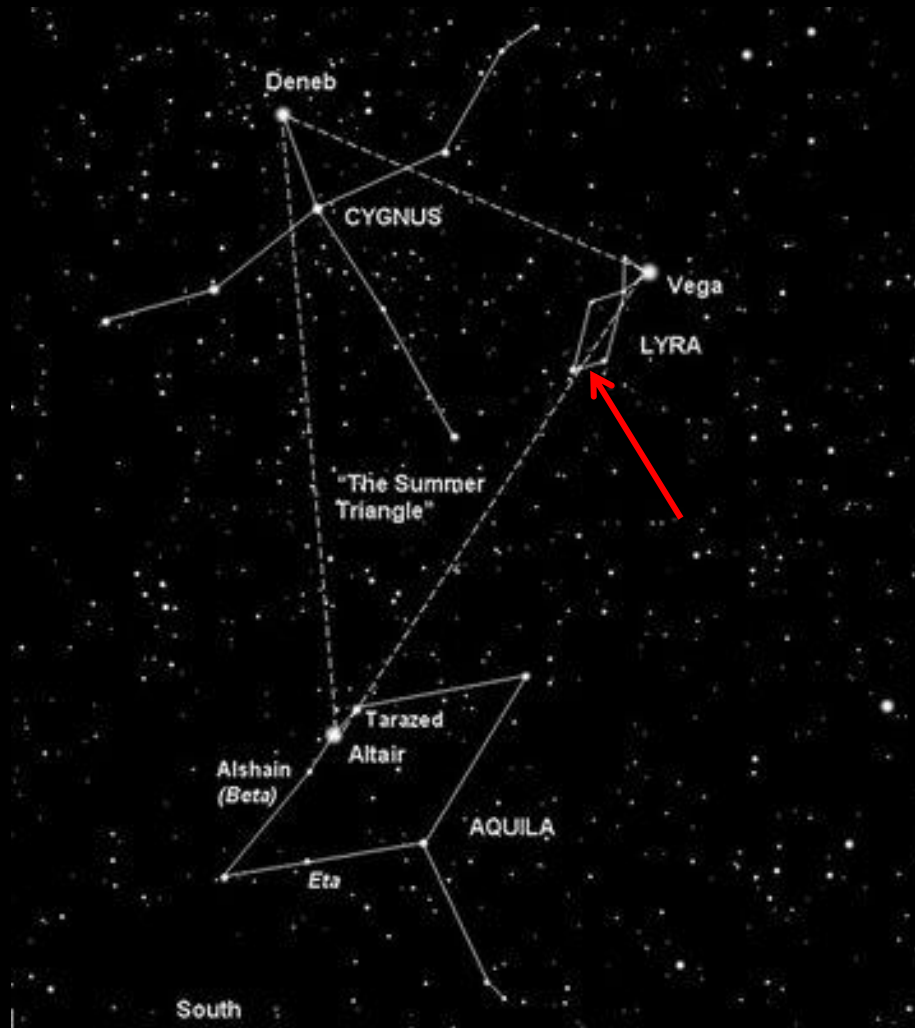
**Witch Head
Nebula
(IC 2118)**











Ring Nebula (M57) (Lyra)



Dumbbell Nebula (M27) (Vulpecula)



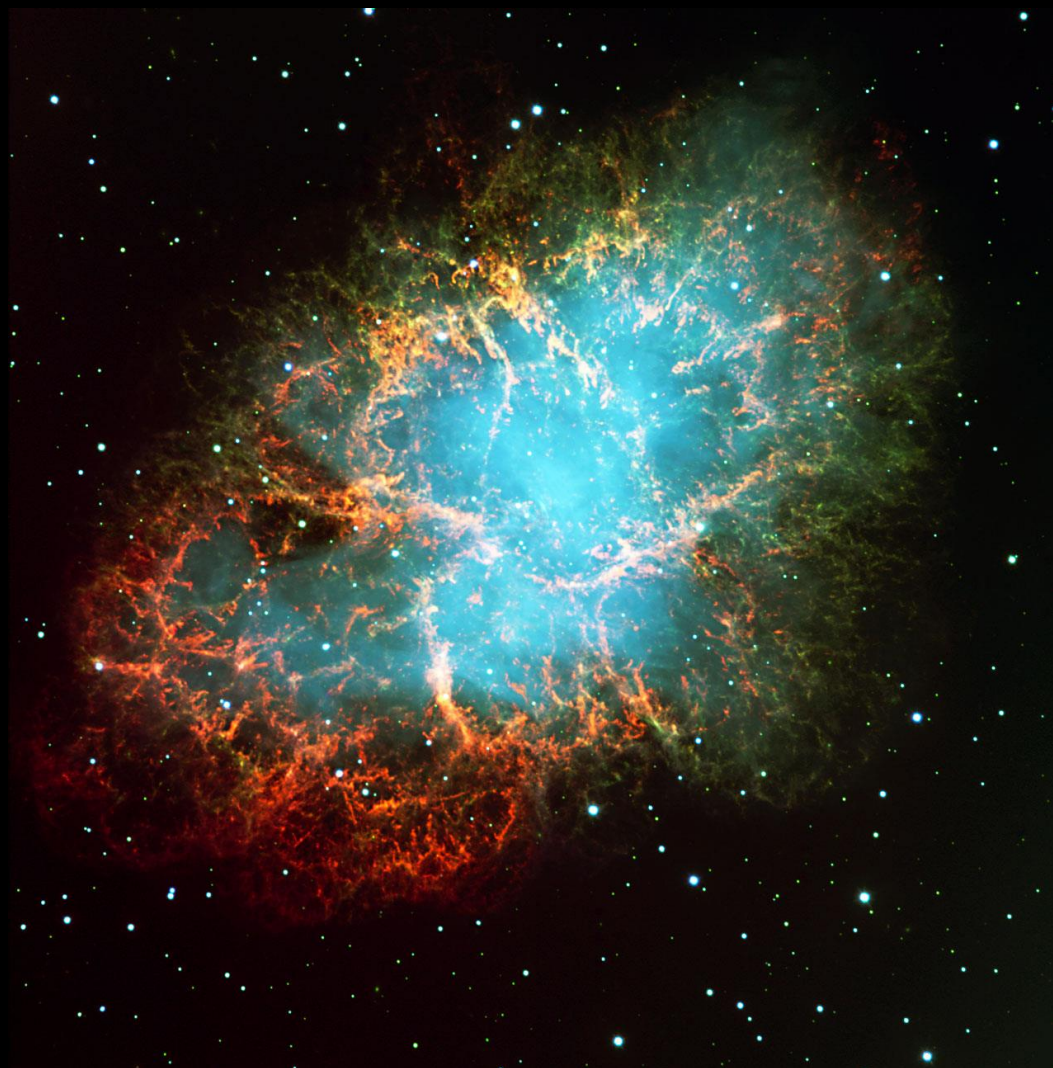
Owl Nebula (M97) (Ursa Major)



Cat's Eye Nebula



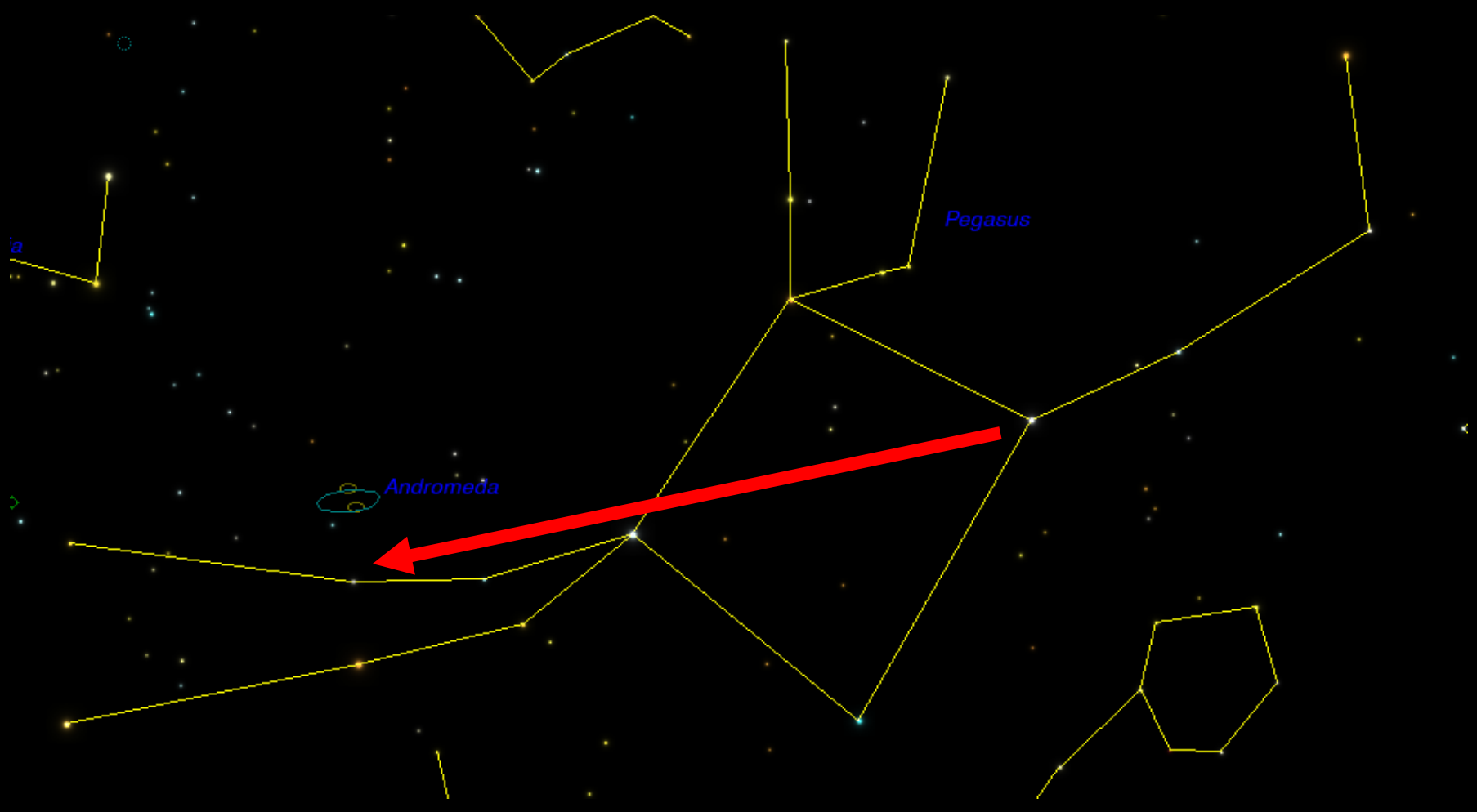
Crab Nebula (M1) (Taurus)



Galaxies

- Elliptical
- Spiral
- Barred-spiral
- Irregular





Pegasus

Andromeda

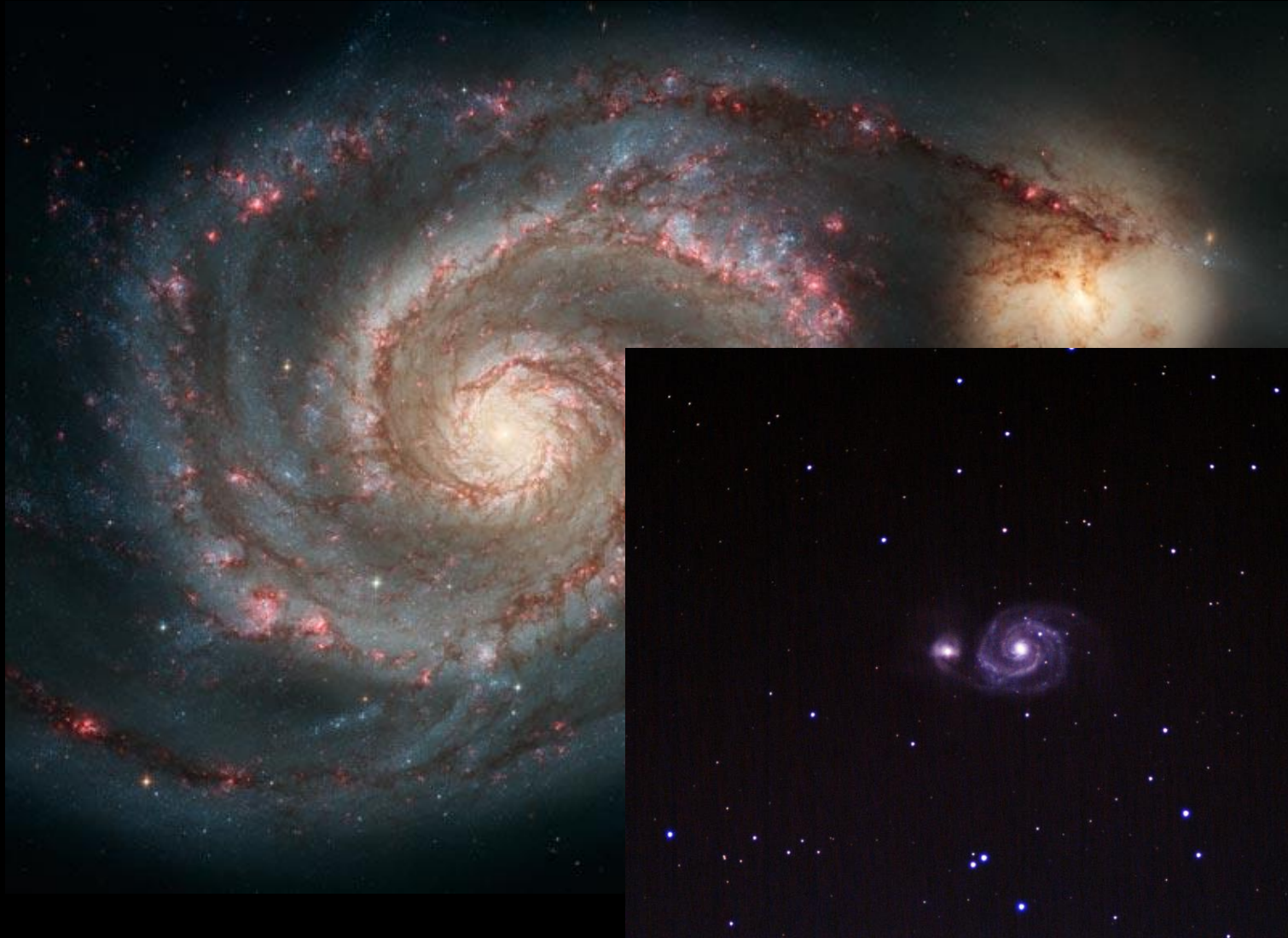
a

b

Andromeda Galaxy (M31)



Whirlpool Galaxy (M51)



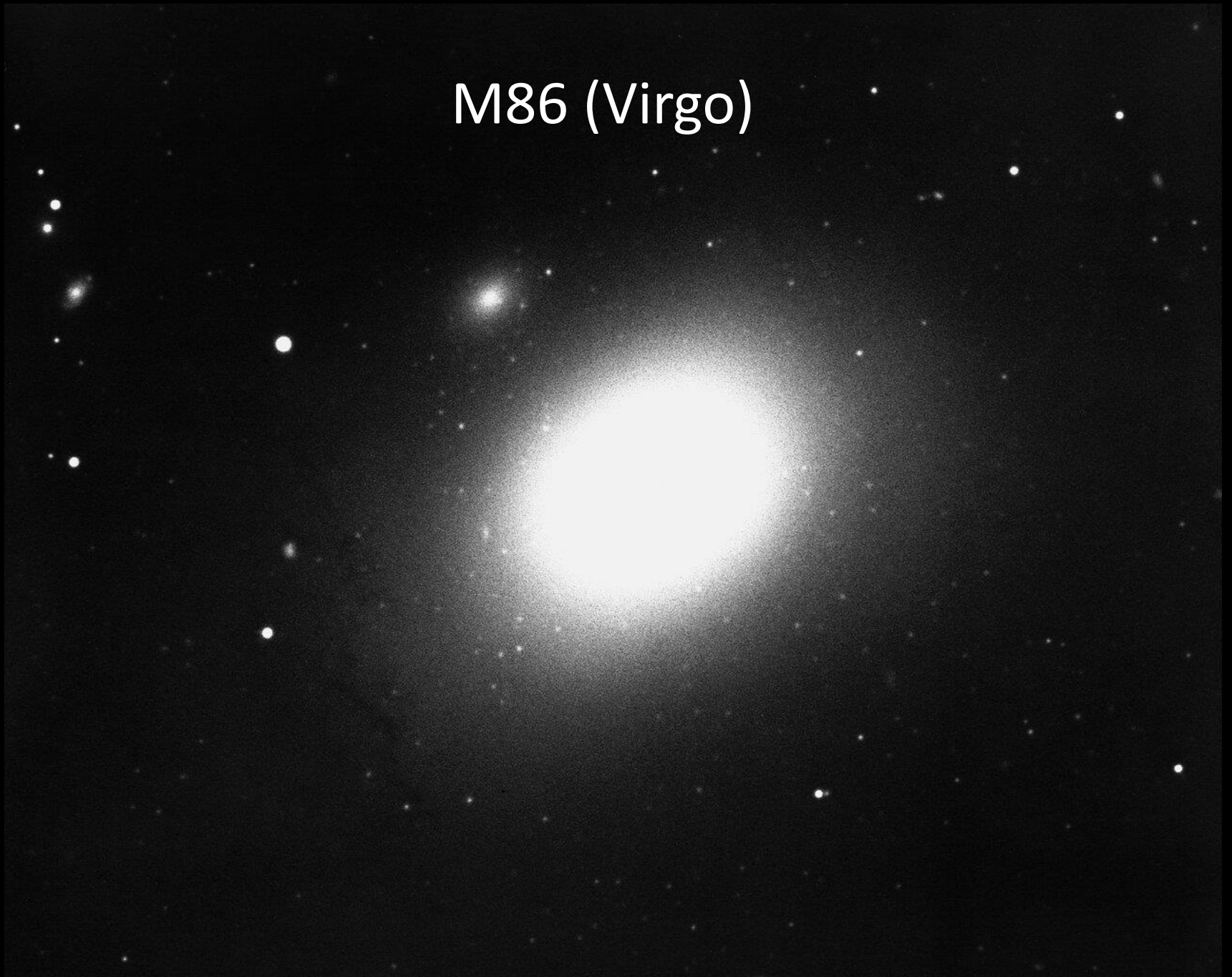
NGC 4565



NGC 1300



M86 (Virgo)



Coma Virgo Cluster

NGC 4501 / M 88

NGC 4402 / NGC 4374 / M 84

NGC 4406 / M 86

NGC 4477

NGC 4388

NGC 4313

NGC 4473

NGC 4438 / The Eyes

NGC 4548 / M 91

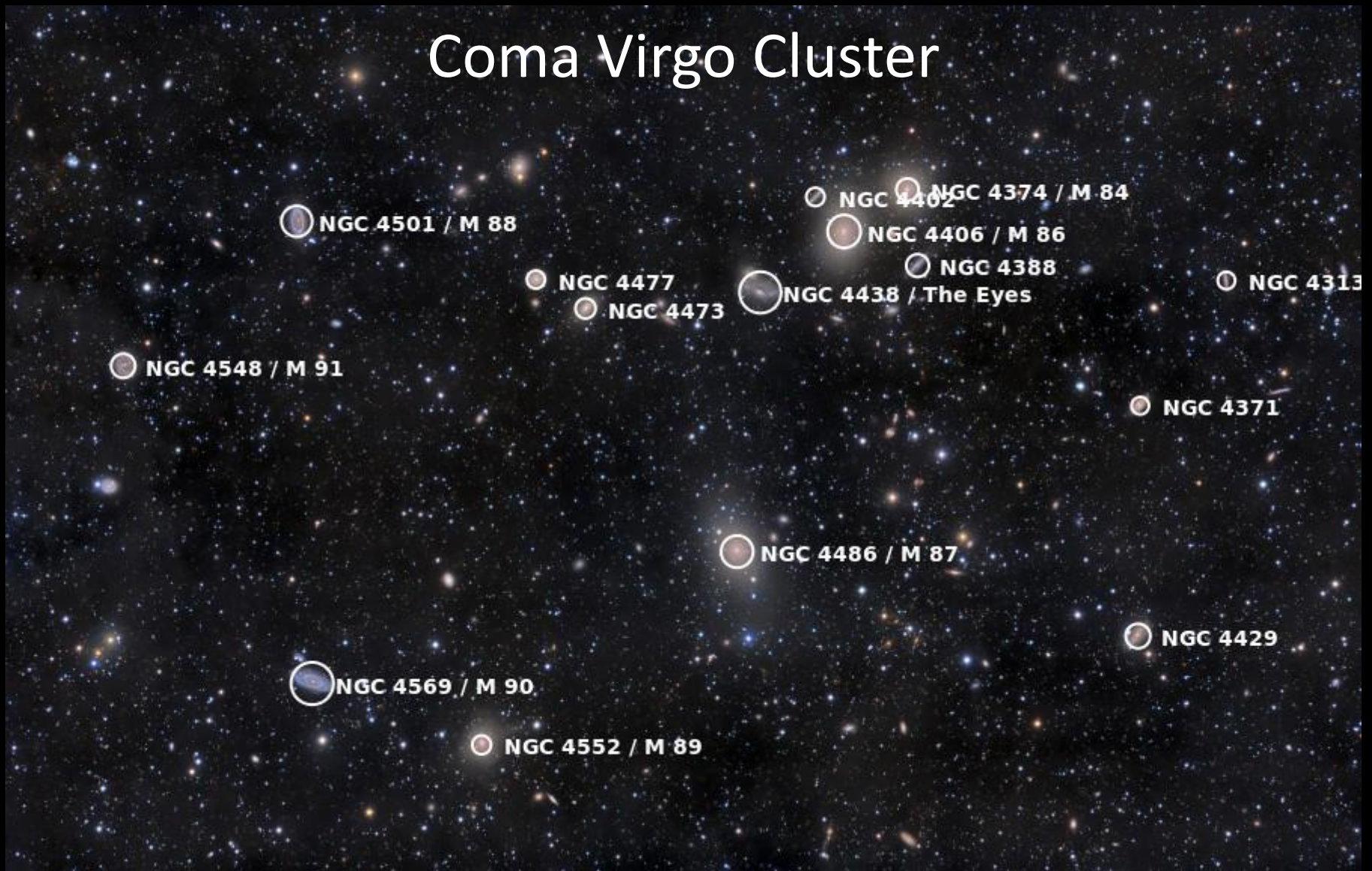
NGC 4371

NGC 4486 / M 87

NGC 4569 / M 90

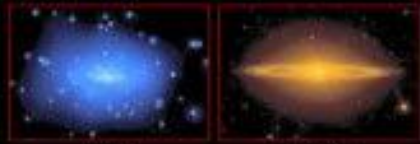
NGC 4429

NGC 4552 / M 89



Stephen's Quintet (Pegasus)





Gas

Dust

Ellipticals



E0

E3

E5

E7

S0

Lenticulars



SBa



SBb



SBc

Barred

Normal

Spirals



Sa



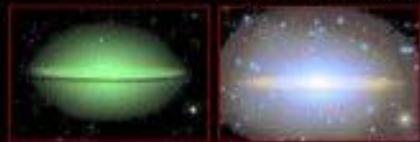
Sb



Sc

Irr

Irregulars



Stars

Gas, Dust, Stars

RULE #1: *DON'T EXPECT TO SEE THIS!!!*



“Ring Nebula”



“Crab Nebula”



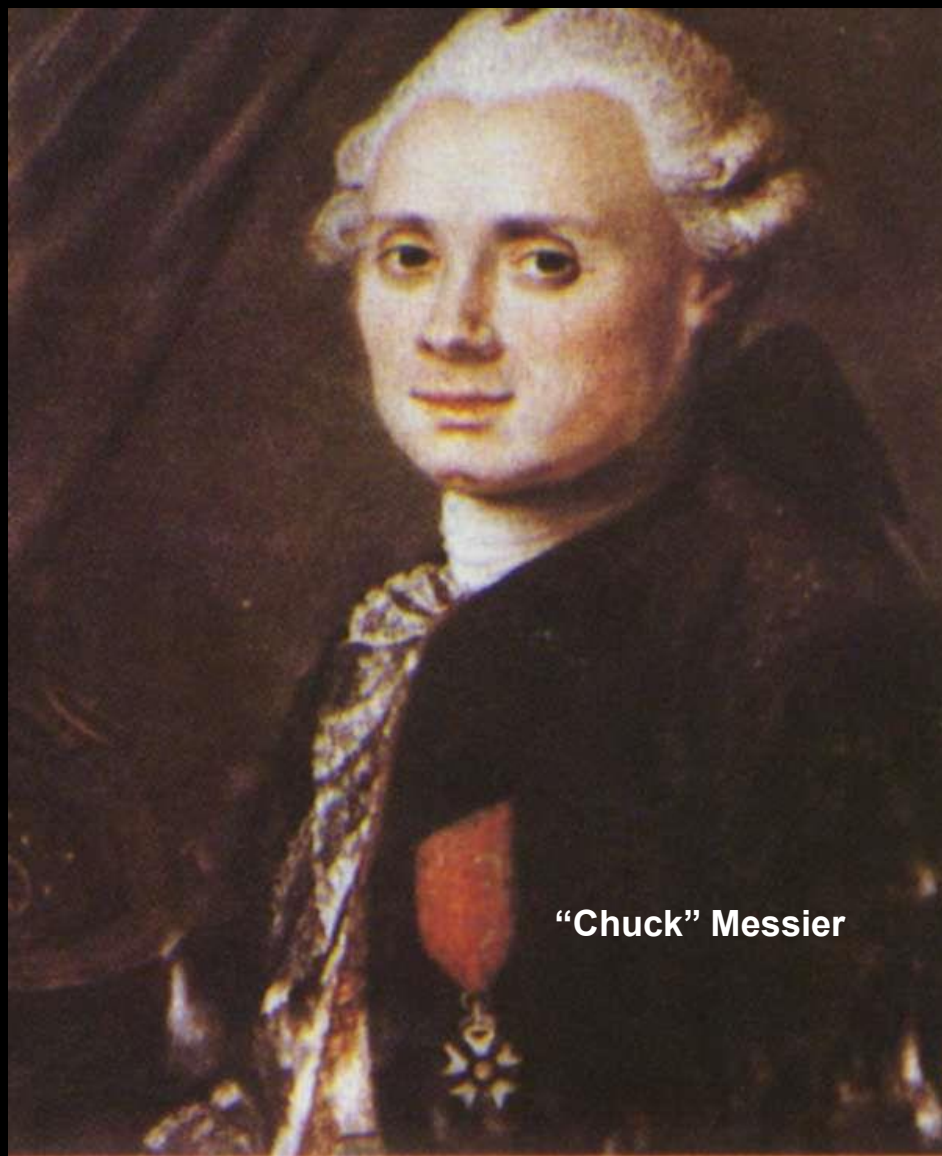
“Dumbbell Nebula”



M13

M13 in Hercules

“OK. . . So what’s this M-thing?”

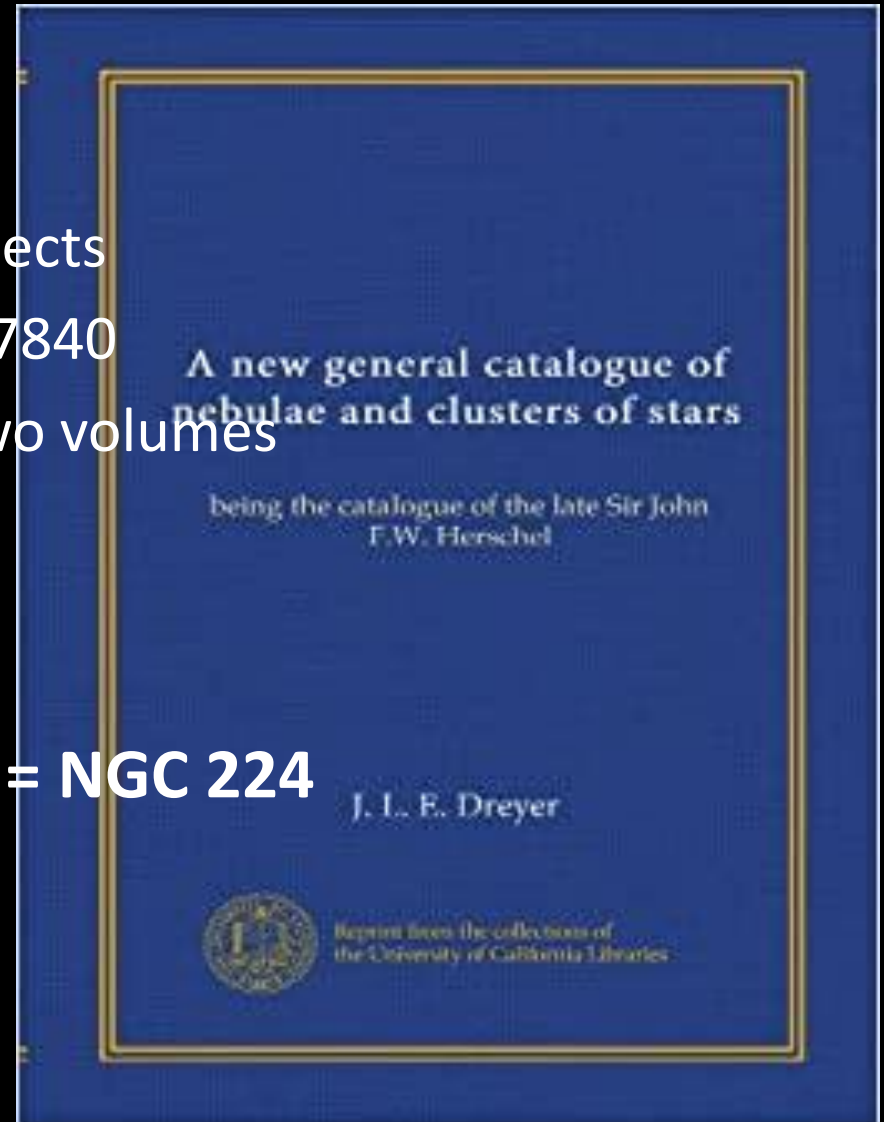


“Chuck” Messier

Catalogs of objects

- Messier Catalog (M) – 110 objects
- New General Catalog (NGC) - 7840
- Index Catalog (IC) – 5386 in two volumes
- Herschel Catalog (H) - 400
- Caldwell Catalog (C) - 109

Andromeda Galaxy = M31 = NGC 224



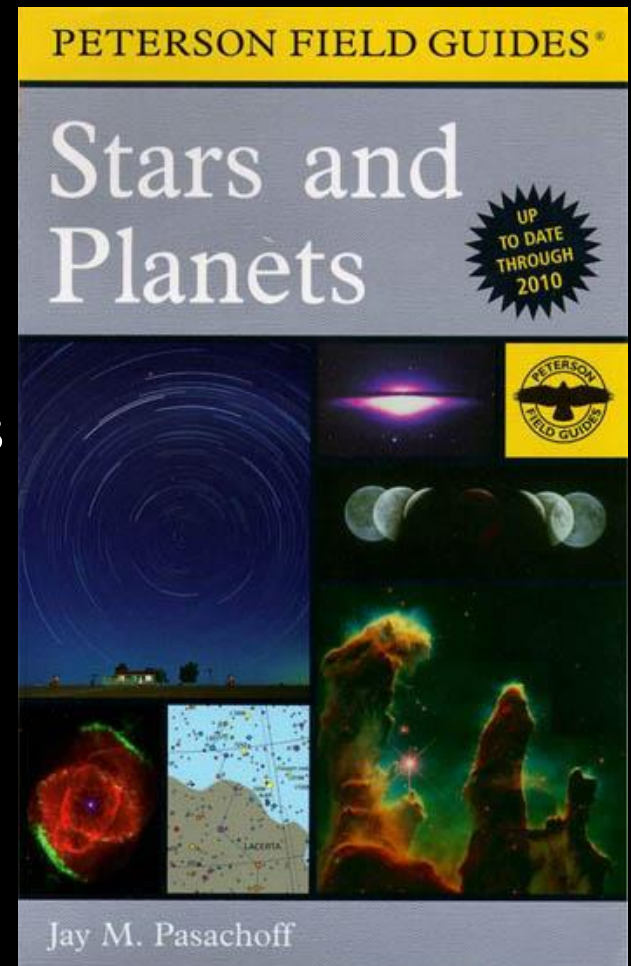
Messier Catalog

M	NGC	Type	Mag.	Size arcmin	Distance (ly)	Right Ascension	Declination	Con	Viewing Season	Common Name
M1	1952	Sn	8.4	6x4	6300	5h 34.5m	+22° 01'	Tau	winter	Crab Nebula
M2	7089	Gc	6.5	12.9	37900	21h 33.5m	-00° 49'	Aqr	autumn	
M3	5272	Gc	6.2	16.2	33900	13h 42.2m	+28° 23'	CVn	spring	
M4	6121	Gc	5.6	26.3	7200	16h 23.6m	-26° 32'	Sco	summer	
M5	5904	Gc	5.6	17.4	24500	15h 18.6m	+02° 05'	Ser	summer	
M6	6405	Oc	4.2	25	1600	17h 40.1m	-32° 13'	Sco	summer	Butterfly Cluster
M7	6475	Oc	3.3	80	800	17h 53.9m	-34° 49'	Sco	summer	Ptolemy's Cluster
M8	6523	Di	6.0	90x40	5200	18h 03.8m	-24° 23'	Sgr	summer	Lagoon Nebula
M9	6333	Gc	7.7	9.3	26700	17h 19.2m	-18° 31'	Oph	summer	
M10	6254	Gc	6.6	15.1	14400	16h 57.1m	-04° 06'	Oph	summer	
M11	6705	Oc	6.3	14	6000	18h 51.1m	-06° 16'	Sct	summer	Wild Duck Cluster
M12	6218	Gc	6.7	14.5	16000	16h 47.2m	-01° 57'	Oph	summer	
M13	6205	Gc	5.8	16.6	25100	16h 41.7m	+36° 28'	Her	summer	Great Hercules Globular
M14	6402	Gc	7.6	11.7	29000	17h 37.6m	-03° 15'	Oph	summer	
M15	7078	Gc	6.2	12.3	33600	21h 30m	+12° 10'	Peg	autumn	Great Pegasus Globular

<http://astropixels.com/messier/messiercat.html>

Resources

- Peterson Field Guides
- Burnham's Celestial Handbook
- Revised NGC
- Celestial Objects for Common Telescopes (Webb)
- Etc, etc, etc



Possible Week #8 topics:

- Space travel
- Photographing the night sky
- Northern Lights (Aurora)
- Beyond visible light (radio, X-ray, Infrared, etc)
- Stellar evolution (including black holes)
- Astrology
- What is “science?”
- History of the space program
- Why is it cold in the winter? (Seasons)
- Light pollution – causes and solutions
- Archeoastronomy (how the ancients saw/used the sky)
- Your ideas Something I haven’t thought of

Email dleake@parkland.edu