Exploring the Universe Using Binoculars

Midcoast Senior College

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Unit 08

Bright and Dark Nebulae

Bright Nebulae

Bright nebulae are interstellar clouds of gas and dust, such as the Orion Nebula, that glow

either from the energy of nearby stars (emission nebulae)

or

by reflecting starlight (reflection nebulae).

Binocular Bright Nebulae

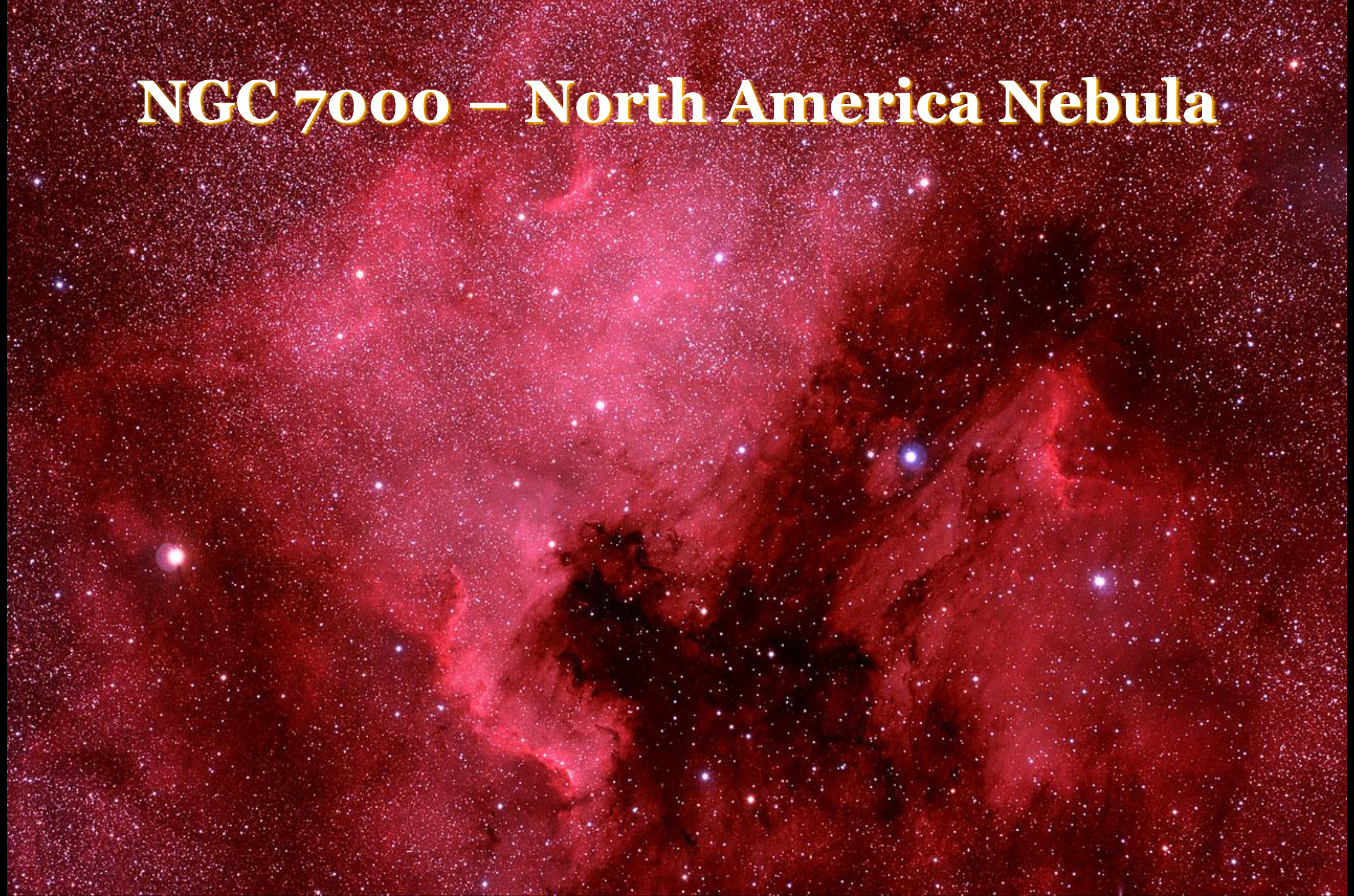
Name	Const	R.A.	Dec.	Mag.	Comments
Orion Nebulae - M42 and M43	Ori	05 35 23	-05 27 06	4.00	Easy, Unaided Eye!
Lagoon Nebula - M8	Sgr	18 03 47	-24 22 54	6.00	Relatively Easy
Swan (Omega) Nebula - M17	Sgr	18 20 47	-16 10 55	6.00	Relatively Easy
Trifid Nebula - M20	Sgr	18 02 35	-23 01 54	6.30	Relatively Easy
North America Nebula - NGC 7000	Cyg	20 58 48	+44 20 00	4.00	
Western Veil Nebula - NGC 6960	Cyg	20 45 42	+30 43 00	5.00	
Eastern Veil Nebula - NGC 6995	Cyg	20 56 23	+31 43 00	5.00	
Rosette Nebula - NGC 2238	Mon	06 30 17	+05 02 55	5.50	
California Nebula - NGC 1499	Per	04 00 41	+36 36 52	5.00	
eta Carina Nebula - NGC 3372	Car	10 43 48	-59 51 57	1.00	Southern Skies
Running Chicken Nebula - IC 2948	Cen	11 38 48	-63 31 55	4.50	Southern Skies
M45 - Pleiades	Tau	03 46 59	+24 06 52	1.50	Reflection
Witch Head Nebula - IC 2118	Eri	05 06 53	-07 13 07	10.00	Reflection
Rho Oph Region - IC 4604	Oph	16 25 35	-23 25 52	5.09	Reflection

Emission Nebulae

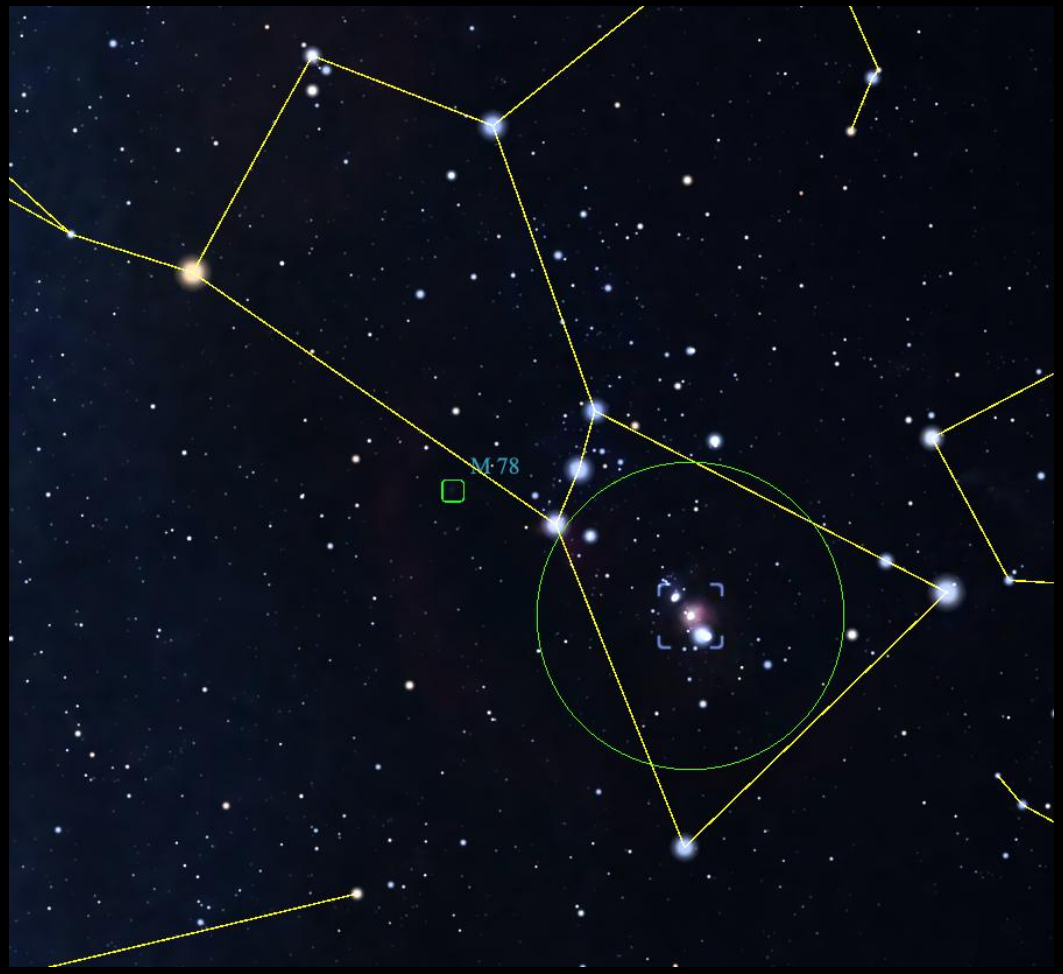
An emission nebula is a cloud of gas in space that glows on its own.

An emission nebula is made mostly of hydrogen gas. Nearby hot, young stars shine so intensely that they energize (ionize) the gas. When the gas cools back down, it releases light, causing the nebula to glow—usually in red or pink.

NGC 7000 – North America Nebula



M42 – The Great Orion Nebula



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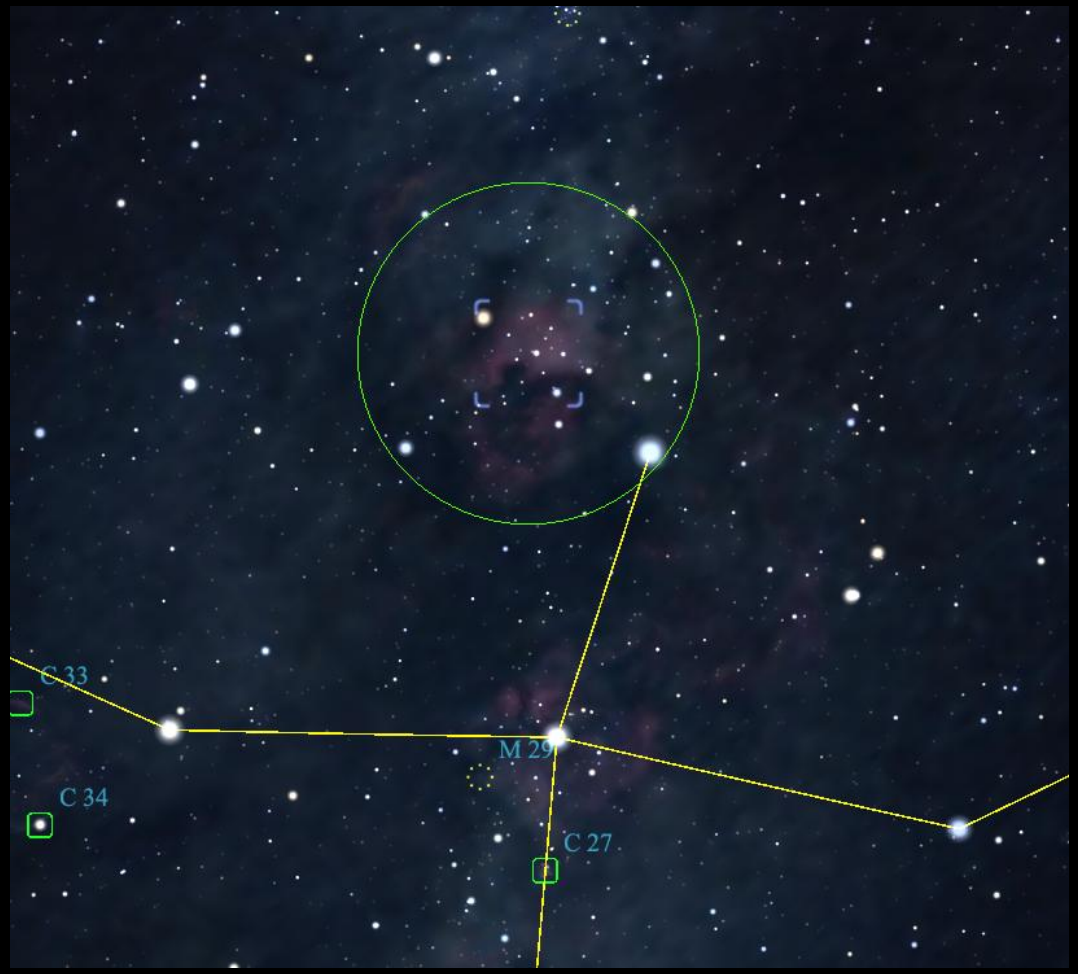
NGC 7000 – North America Nebula



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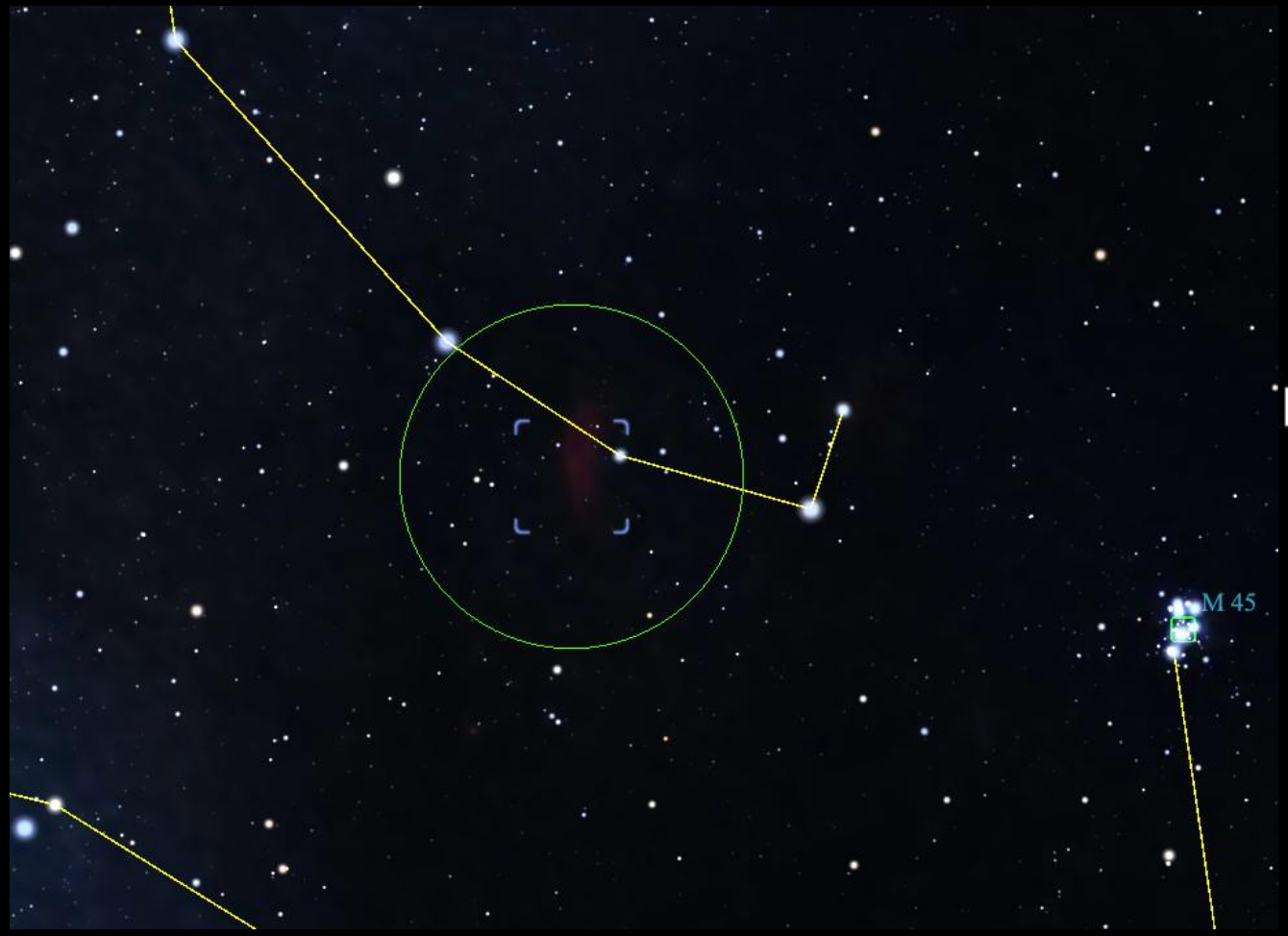
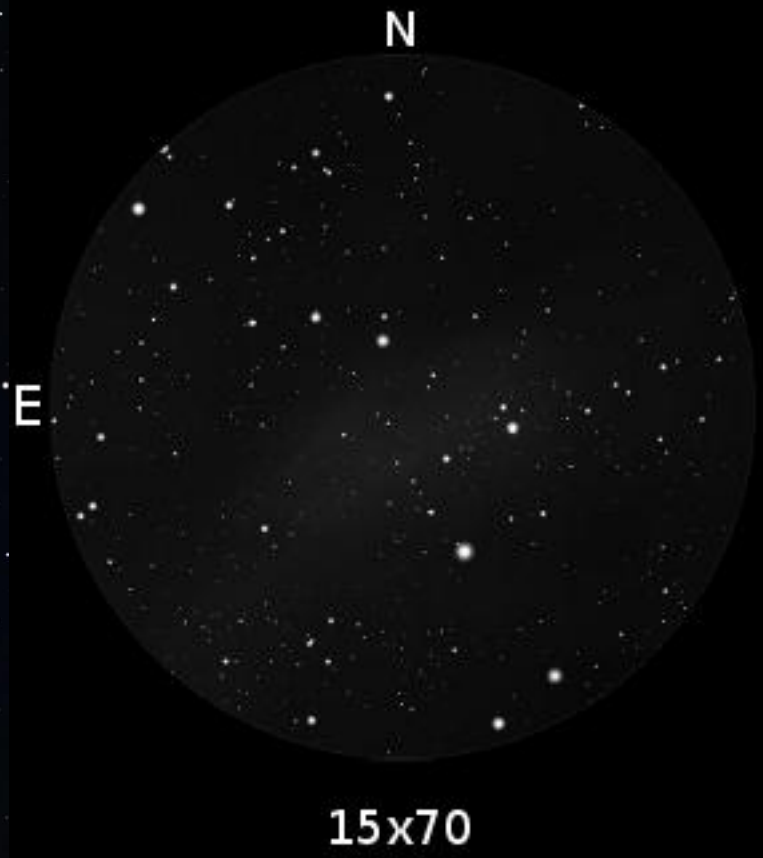
NGC 1499 – California Nebula





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Reflection Nebulae

A reflection nebula is made mostly of tiny dust particles.

Unlike emission nebulae, the dust isn't energized enough to glow by itself. Instead, when nearby stars shine on it, the dust scatters the starlight, much like sunlight scatters in Earth's atmosphere.

Because dust scatters blue light more easily than red light (just like why our sky looks blue),
reflection nebulae often appear blue.

M45 – Pleiades (Subaru)

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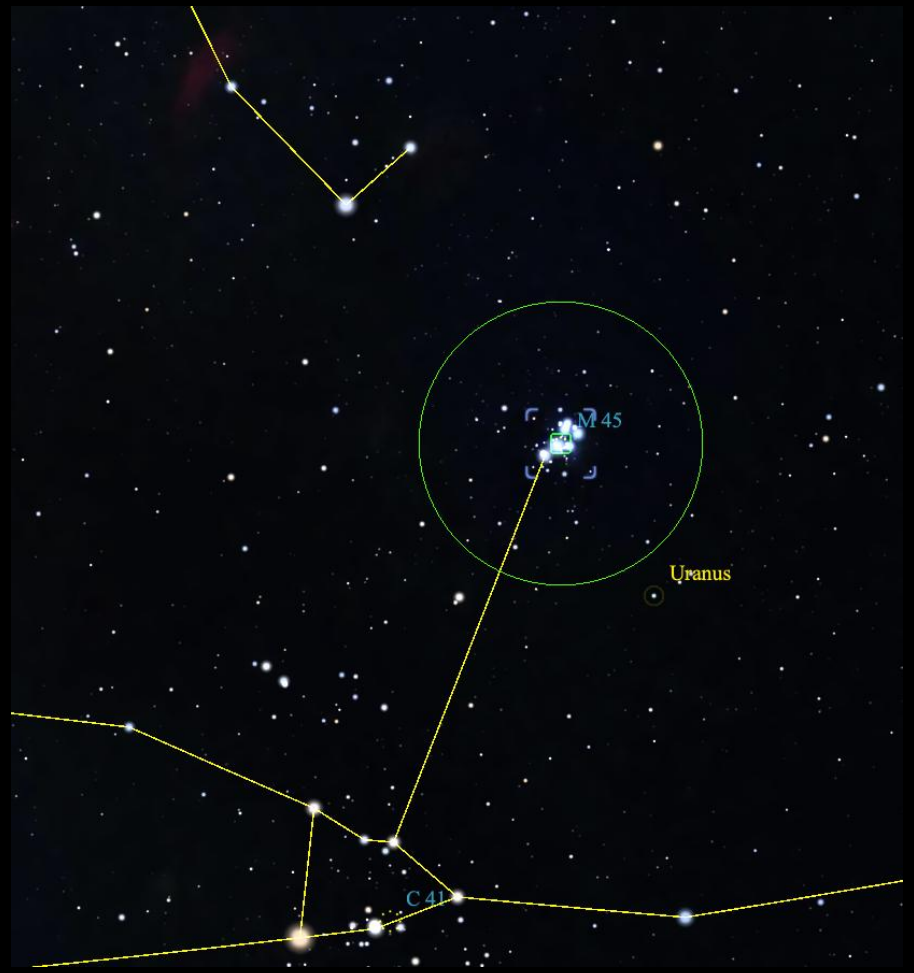

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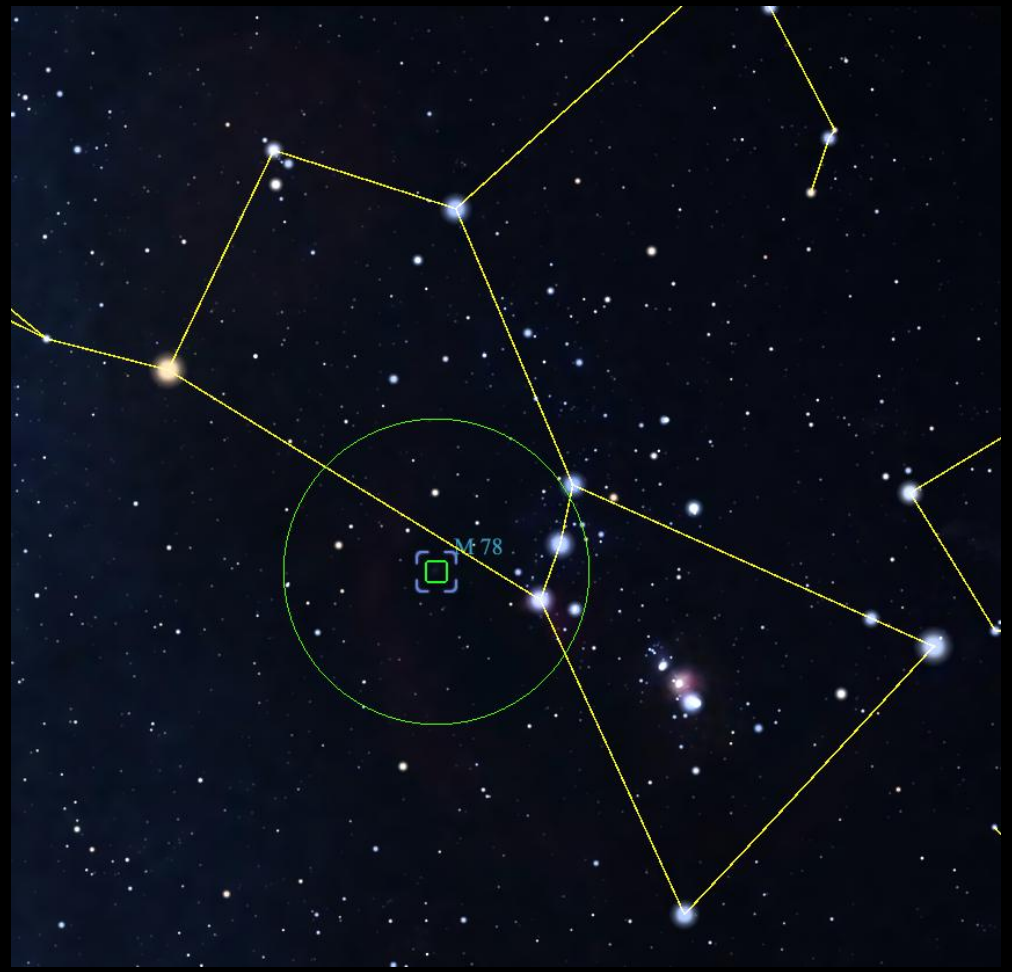
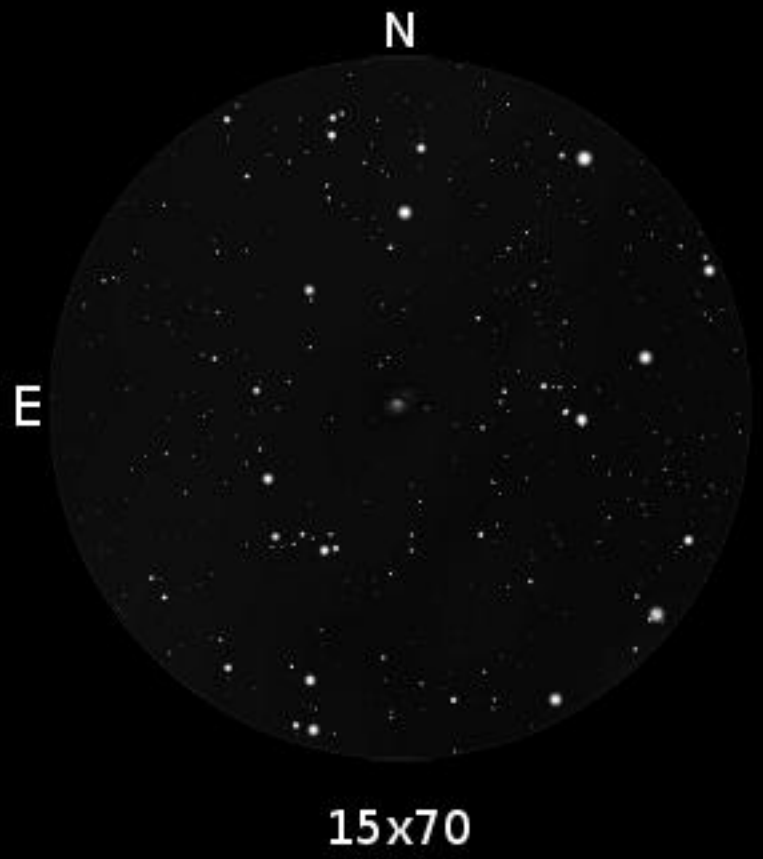
M78 – Orion





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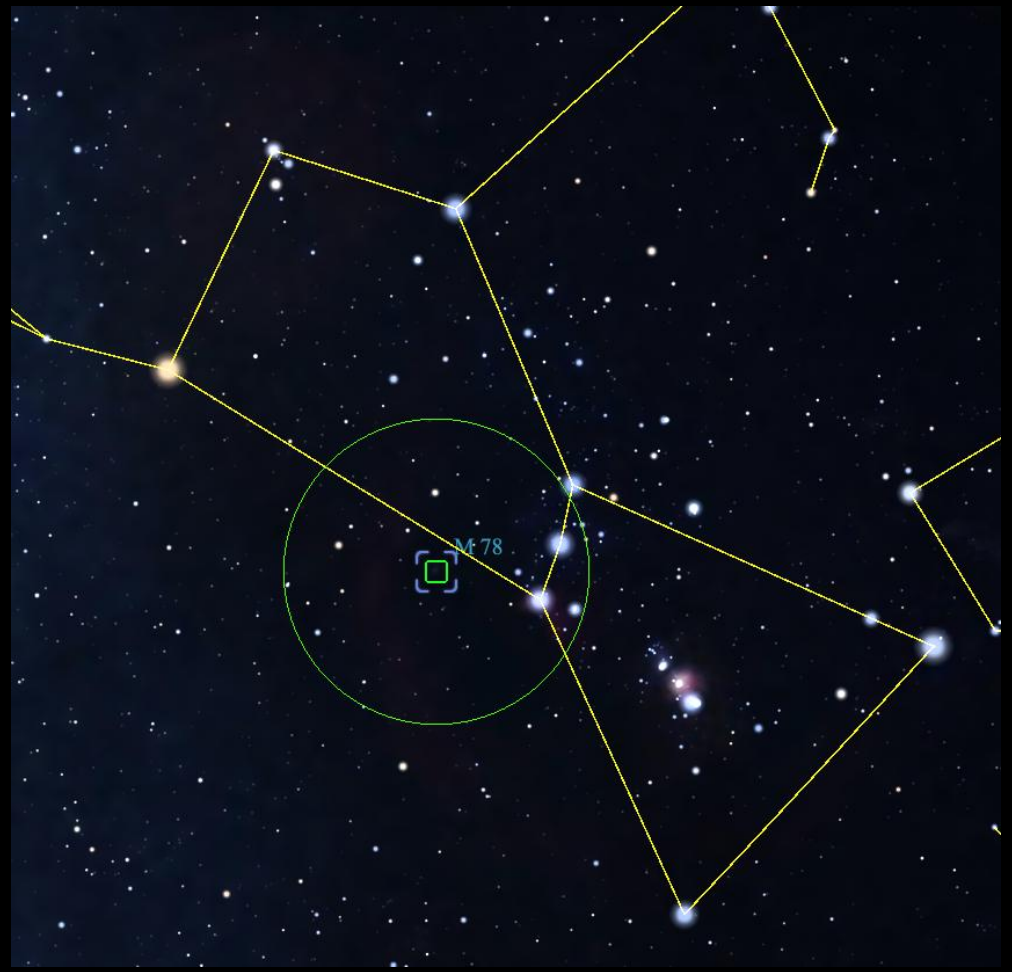
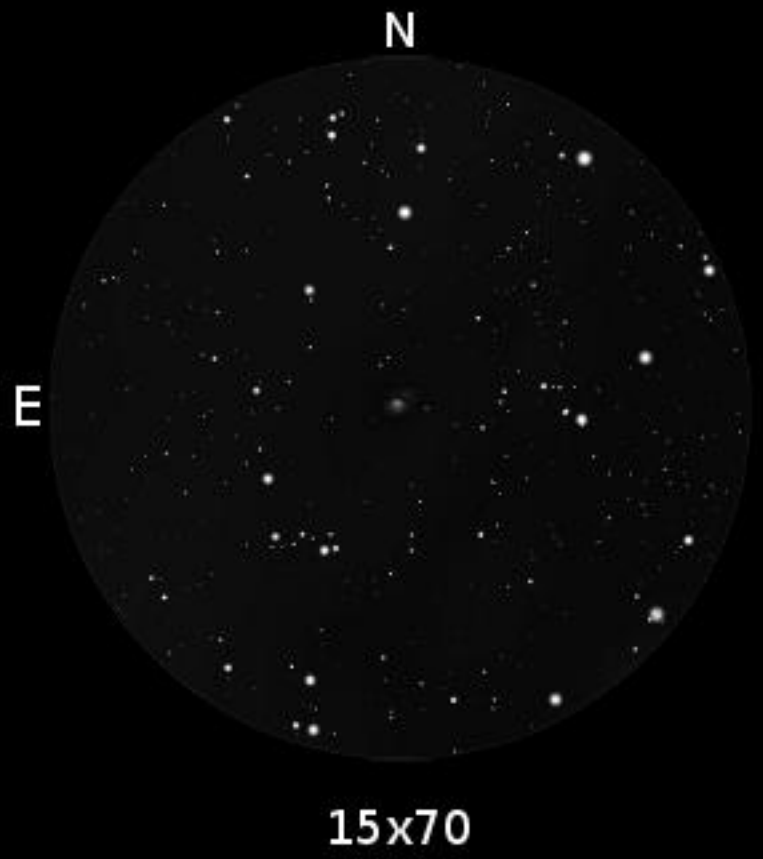
M78 – Orion





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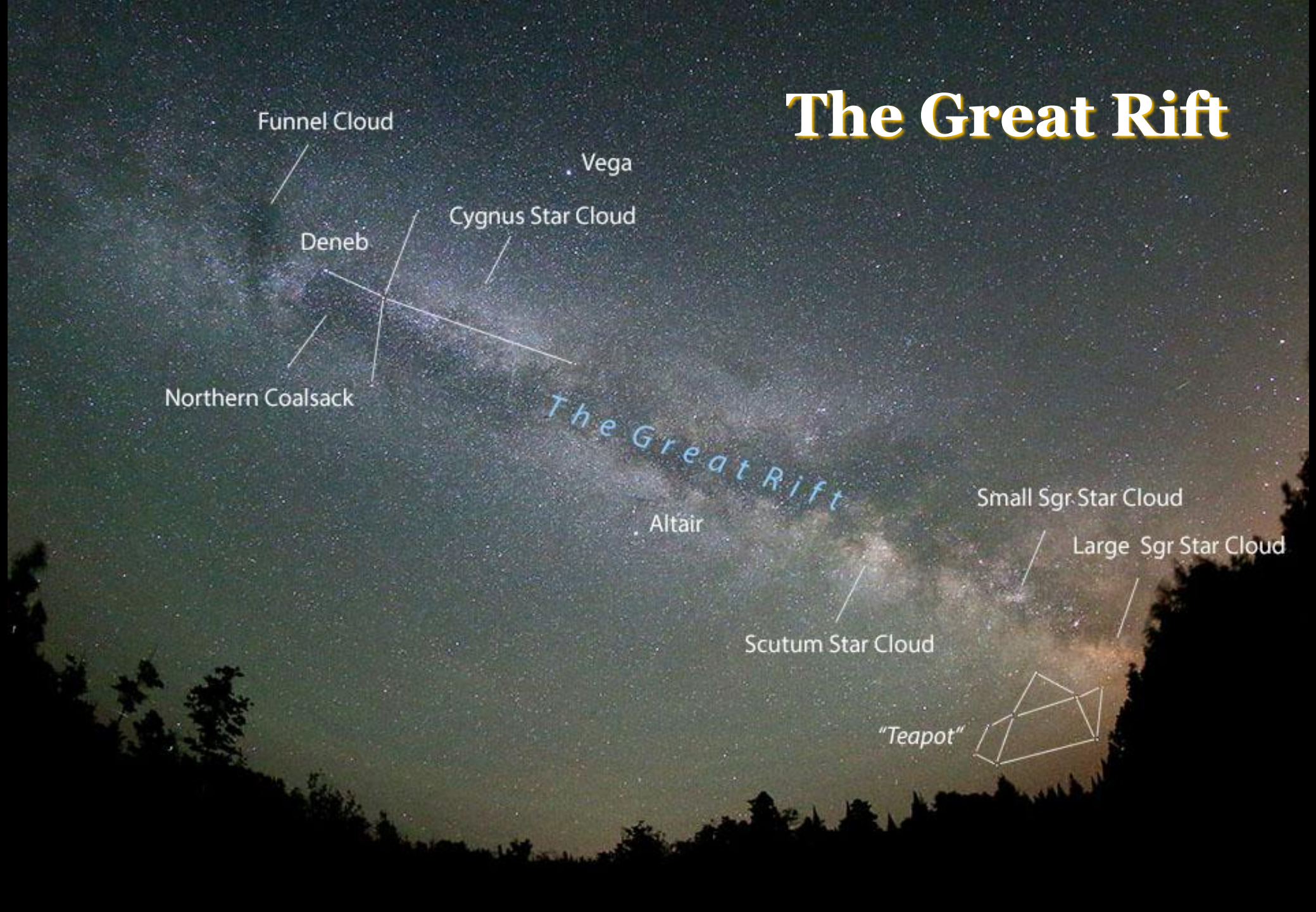
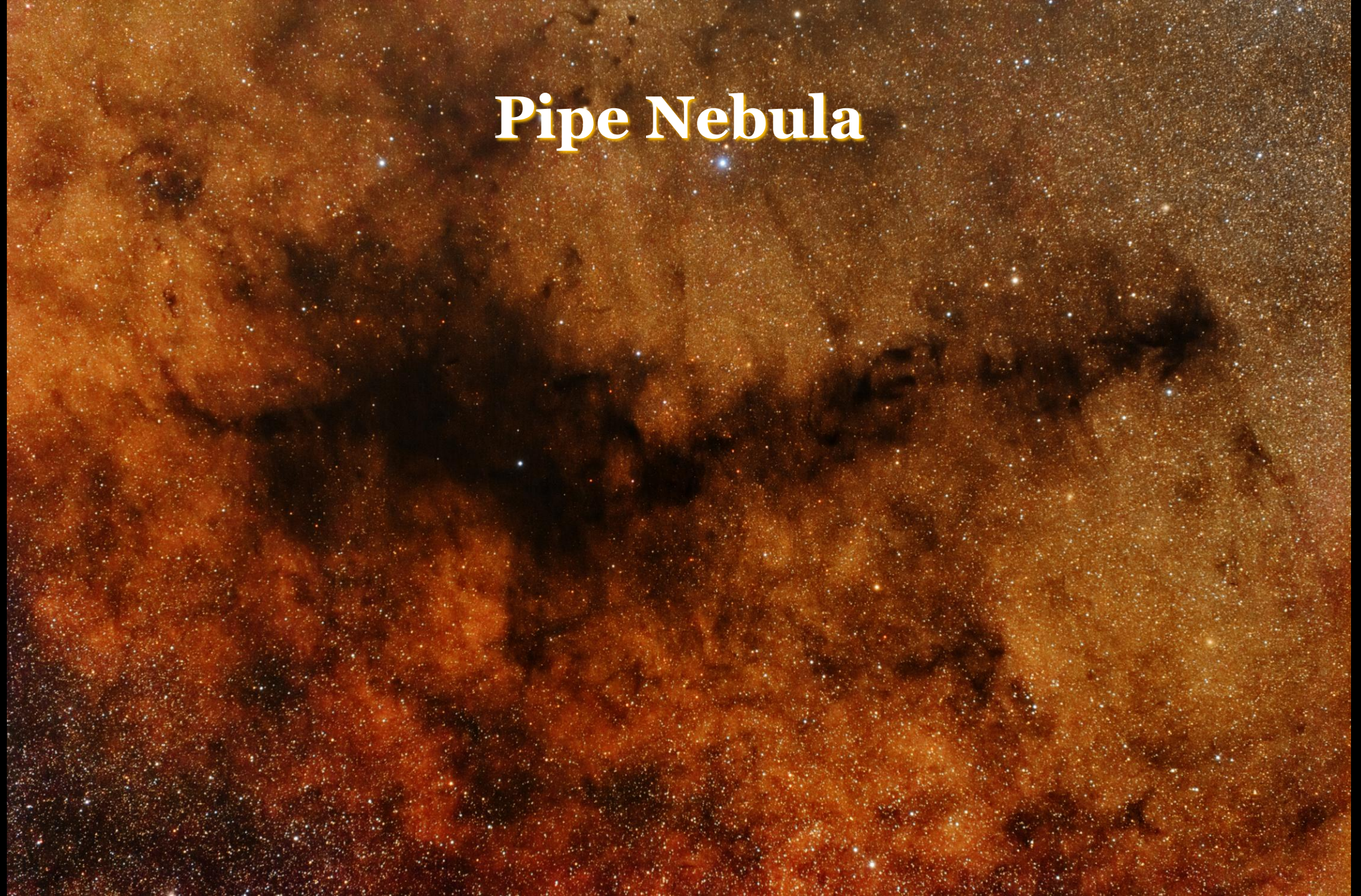
Dark Nebulae

A dark nebula is made of very dense gas and dust —
so dense that light from stars or glowing nebulae behind it can’t get through.

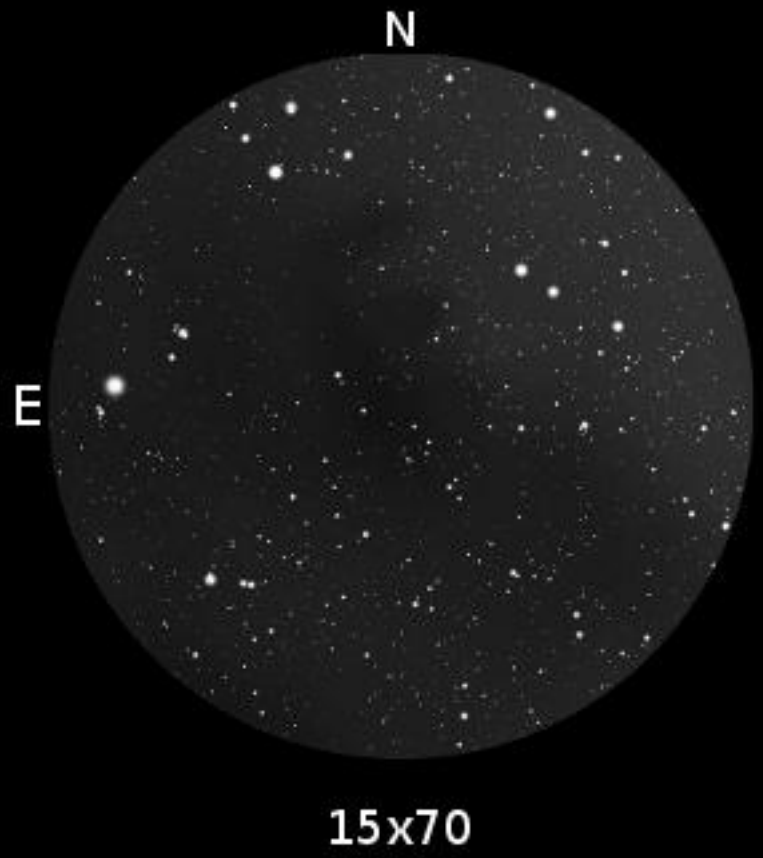
Instead of shining, like emission or reflection nebulae, a dark nebula shows up as a shadowy shape in the sky because it absorbs and blocks the light coming from behind it.

Many dark nebulae are places where new stars are forming,
hidden inside the thick dust.


The Great Rift
Funnel Cloud
Vega
Cygnus Star Cloud
Deneb
Northern Coalsack
The Great Rift
Altair
Small Sgr Star Cloud
Large Sgr Star Cloud
Scutum Star Cloud
"Teapot"


Pipe Nebula

Barnard's "E"



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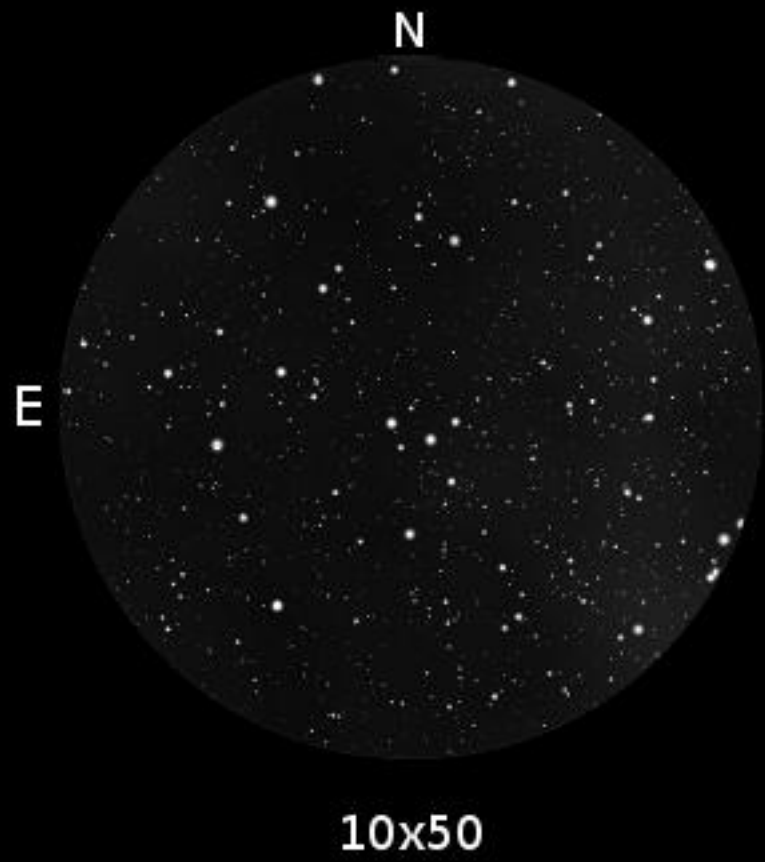
LDN 906 – Northern Coal Sack



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