



OBJECT #548	NGC 6652
Constellation	Sagittarius
Right ascension	18h36m
Declination	-32° 59'
Magnitude	8.5
Size	6'
Type	Globular cluster

July's first target sits 2.8° east-northeast of magnitude 1.8 Kaus Australis (Epsilon [ϵ] Sagittarii). Through a 6-inch telescope at $125\times$, this object has a compact core with an irregular halo around it. A 14-inch scope at $300\times$ didn't resolve any of its stars, but it did expand the core enough to make it appear wedge-shaped, pointed toward the east-southeast. Magnitude 6.9 SAO 210344 lies $7'$ northwest of the cluster's center.



Object #549 M22 Doug Matthews/Adam Block/NOAO/AURA/NSF

OBJECT #549	M22 (NGC 6656)
Constellation	Sagittarius
Right ascension	18h36m
Declination	-23° 54'
Magnitude	5.1
Size	24'
Type	Globular cluster

One of the most spectacular objects in Sagittarius is globular cluster M22. This easy naked-eye object ranks as the sky's third-brightest globular, exceeded only by Omega Centauri (NGC 5139) and 47 Tucanae (NGC 104).

In the *Cycle of Celestial Objects*, Admiral Smyth describes M22 as “A fine globular cluster, outlying that astral stream, the Via Lactea, in the space between the Archer's head and bow, not far from the point of the winter solstice, and midway between μ and σ Sagittarii. It consists of very minute and thickly condensed particles of light, with a group of small stars preceding by 3', somewhat in a crucial form. Halley ascribes the discovery of this in 1665, to Abraham Ihle, the German; but it has been thought this name should have been Abraham Hill, who was one of the first council of the Royal Society, and was wont to dabble with astronomy. Hevelius, however, appears to have noticed it previous to 1665, so that neither Ihle nor Hill can be supported.”

When you observe M22, altitude — how high it appears in the sky — is everything. Many amateur astronomers in Northern Europe, Canada, and the northern United States are unaware of this cluster's magnificence because, for them, it hugs the southern horizon. See it high in the sky, however, and you'll understand the hype.

Through even a 4-inch telescope, you'll see several dozen stars. Pay attention to the bright starry background, which adds character to the scene. Try to discern exactly where the outer boundary of M22 ends and the background begins.

Move up to a 10-inch scope, and you'll be overwhelmed by hundreds of member stars. You can try counting them by dividing M22 into eight wedge-shaped pieces. Count the stars in just one wedge, then multiply by 8.

M22 lies 2.4° northeast of magnitude 2.8 Kaus Borealis (Lambda [λ] Sagittarii).

Turning to Smyth once more, we learn a bit about the state of astronomy in 1844: "This object is a fine specimen of the compression on which the nebula-theory is built. The globular systems of stars appear thicker in the middle than they would do if these stars were all at equal distances from each other; they must, therefore, be condensed towards the centre. That the stars should be thus accidentally disposed is too improbable a supposition to be admitted; whence Sir William Herschel supposes that they are thus brought together by their mutual attractions, and that the gradual condensation towards the centre must be received as proof of a central power of such a kind."

OBJECT #550	NGC 6664
Constellation	Scutum
Right ascension	18h37m
Declination	$-8^\circ 13'$
Magnitude	7.8
Size	12'
Type	Open cluster

Our next target lies only 0.3° east of Alpha (α) Scuti. You'll sweep both up with a low-power eyepiece, so move Alpha Sct out of the field of view for a better look at the cluster. Even through a 2.4-inch telescope, you'll see NGC 6664's brightest stars. Through larger scopes, about 50 stars appear. Look for the "M" or "U" pattern formed by the brightest stars, which some observers have reported.

OBJECT #551	IC 4756
Constellation	Serpens (Cauda)
Right ascension	18h39m
Declination	$5^\circ 27'$
Magnitude	4.6
Size	52'
Type	Open cluster
Other name	Graff's Cluster

At the northern edge of Serpens Cauda sits a pleasantly surprising open cluster and a rare example of a naked-eye object with an IC (*Index Catalogue*) designation. To find it, look 4.5° west-northwest of magnitude 4.6 Alya (Theta [θ] Serpentis).

IC 4756 is a widely scattered open cluster that appears at dark observing sites as a small bright haze near the edge of the Milky Way. Through a 4-inch telescope, you'll see a huge, beautiful collection of 50 magnitude 9 and 10 stars. The cluster's brightest star, magnitude 6.4 SAO 123778, sits at IC 4756's southeast edge.

This cluster's common name comes from German astronomer Kasimir Romuald Graff (1878–1950) who, in 1922, independently discovered it. Solon Bailey had found it earlier on photographic plates taken at Harvard College's Arequipa station in Peru.

OBJECT #552	M70 (NGC 6681)
Constellation	Sagittarius
Right ascension	18h43m
Declination	$-32^\circ 18'$
Magnitude	8.0
Size	7.8'
Type	Globular cluster

This southerly Messier object lies midway between magnitude 2.6 Ascella (Zeta [ζ] Sagittarii) and magnitude 1.8 Kaus Australis (Epsilon [ϵ] Sagittarii). M70 (NGC 6681) is similar in brightness to M69 (Object #542), but has a more sharply concentrated center. Through an 8-inch telescope at 200 \times , you'll see a bright core and a thin halo in which you can resolve half a dozen stars. A short line of relatively bright stars shoots northward from the cluster's eastern side.

M70 has an association with Comet C/1995 O1 (Hale-Bopp). Neither discoverers Alan Hale nor Thomas Bopp was actively comet-hunting when they made their discoveries July 23, 1995. They merely pointed telescopes at M70 and spotted a foreign object in the field of view.



Object #553 Epsilon Lyrae Adam Block/NOAO/AURA/NSF

OBJECT #553	Epsilon (ϵ) Lyrae
Constellation	Lyra
Right ascension	18h44m
Declination	39°39'
Magnitudes	5.0/6.1;5.5/5.5
Separations	2.6''/2.3''
Type	Double star
Other name	The Double Double

Our next object will surprise you through a small telescope. It's the star Epsilon (ϵ) Lyrae, but most observers call it the Double Double. As the name indicates, Epsilon is a pair of double stars that lie close together.

You'll find Epsilon easily. It sits 1.7° east-northeast of Vega. Through binoculars, you'll see the initial double nature of this object, and you might think, "Ah, a double star." You're half right.

Point a telescope toward it, and you'll see both "stars" resolve into pairs. To assure success, use a magnification above $75\times$. I've split both pairs many times through a 2.4-inch (60-millimeter) telescope, so you shouldn't have a problem.

OBJECT #554	NGC 6684
Constellation	Pavo
Right ascension	18h49m
Declination	$-65^\circ 11'$
Magnitude	10.4
Size	4.5' by 3.3'
Type	Barred spiral galaxy

Center magnitude 5.7 Theta (θ) Pavonis in your eyepiece, and you'll be only 6' north-northwest of this object. Through an 8-inch telescope at $200\times$, you'll see a bright core surrounded by a circular halo 2' across. Increasing the aperture brightens the galaxy but fails to reveal additional detail.

For an extra bit of challenge, point your telescope 0.5° northeast of NGC 6684, and try to spot NGC 6684A. This magnitude 14.3 irregular galaxy measures 2.6' by 1.3'.

OBJECT #555	M26 (NGC 6694)
Constellation	Scutum
Right ascension	18h45m
Declination	$-9^\circ 24'$
Magnitude	8.0
Size	14'
Type	Open cluster

Our next target, M26, lies in a rich star field in a Milky Way region called the Scutum Star Cloud. Through a 4-inch scope, you'll see two dozen stars. Increase the aperture to 12', and you'll have a good chance to resolve another 70 cluster members.

To find this object, draw a line from magnitude 3.9 Alpha (α) through magnitude 4.7 Delta (δ) Scuti. Then extend the line in the same direction another half the distance between Alpha and Delta.

OBJECT #556	The Scutum Star Cloud
Constellation	Scutum
Right ascension (approx.)	18h37m
Declination (approx.)	-10°
Size (approx.)	4.2° by 2.4°

You won't need any optical aid to find this sky region, but you will need to find the location of the small, faint constellation Scutum the Shield. First, locate the three bright stars of the Summer Triangle (Vega, Altair, and Deneb) as a starting point. Altair's associated constellation is Aquila the Eagle. Scutum lies just off Aquila's tail.

Under a dark, clear sky, you'll notice this region of the summer Milky Way looks like it contains more stars than nearby areas. We call such spots star clouds, and, indeed, lots of star formation is happening here.

Once you can find Scutum easily, view it through binoculars. Now that's a lot of stars!

OBJECT #557	Zeta (ζ) Lyrae
Constellation	Lyra
Right ascension	18h45m
Declination	37°36'
Magnitudes	4.3/5.9
Separation	44''
Type	Double star

This pretty binary combines a light-blue primary with a pale-yellow or yellowish-white secondary. Any telescope will split this bright, wide pair.

OBJECT #558	Beta (β) Lyrae
Constellation	Lyra
Right ascension	18h50m
Declination	33°22'
Magnitude	3.3–4.3
Period	12.936 days
Type	Variable star
Other name	Sheliak

Sheliak is the prototype for a class of variable stars. Beta Lyrae variables are eclipsing binary stars. Here, the larger star totally eclipses its smaller companion to produce its main minimum. Half the period later, the smaller star occults part of the larger one. This generates a secondary minimum of about magnitude 3.8. Beta Lyrae also is a double star with an magnitude 8.6 secondary located 46'' away.

This star's proper name is easy enough to explain. According to Richard Hinckley Allen in *Star-Names and Their Meanings*, it comes from Al Shilyak, one of the Arabian names for Lyra.



Object #559 The Wild Duck Cluster (M11) Adam Block/NOAO/AURA/NSF

OBJECT #559	M11 (NGC 6705)
Constellation	Scutum
Right ascension	18h51m
Declination	-6°16'
Magnitude	5.8
Size	13'
Type	Open cluster
Other name	The Wild Duck Cluster

The Northern Hemisphere's summer is — by far — the best time to view our galaxy's rich star fields. And it's during summer that the spectacular Wild Duck Cluster flies through the Milky Way.

German astronomer Gottfried Kirch discovered the Wild Duck Cluster in 1681. Messier made it his 11th catalog entry May 30, 1764.

The common name originated in *A Cycle of Celestial Objects*, written by Admiral William H. Smyth in 1844. Of M11, Smyth wrote, "A splendid cluster of stars on the dexter chief [upper-right corner] of Sobieski's shield. This object, which somewhat resembles a flight of wild ducks in shape, is a gathering of minute stars with a prominent 8 mag. star in the middle and two following; these are decidedly between us and the cluster."

From a dark site, sharp-eyed observers will spot M11 with their unaided eyes by following a curved line of stars of decreasing brightness. Start with magnitude 3.4 Lambda (λ) Aquilae; move to 4th-magnitude 12 Aql; finally, proceed to magnitude 4.8 Eta (η) Scuti, which will lead you to M11.

An ideal telescope size and magnification for this object are 8 inches and 75 \times . More aperture and higher powers will help you resolve additional stars, but through this combo you'll see more than a hundred stars. M11's core, which resembles a poor globular cluster, is tightly packed, and streamers of stars and dark lanes emanate from the central region in all directions.

OBJECT #560	NGC 6709
Constellation	Aquila
Right ascension	18h52m
Declination	10°21'
Magnitude	6.7
Size	13'
Type	Open cluster

This rich cluster sits 4.9° southwest of magnitude 3.0 Zeta (ζ) Aquilae. It lies some 4,000 light-years away from Earth. You won't spot it with your naked eyes, but small binoculars resolve the cluster well against a background crowded with stars. A 6-inch telescope shows approximately 50 stars of mostly magnitudes 9, 10, and 11. A 12-inch scope more than doubles the number of stars you'll see and provides an illusory layered effect where the fainter stars appear to lie in the background.

OBJECT #561	NGC 6712
Constellation	Scutum
Right ascension	18h53m
Declination	-8°42'
Magnitude	8.2
Size	7.2'
Type	Globular cluster

NGC 6712 is Scutum's only globular cluster. It's bright enough that you can see it through binoculars at a dark site. To get a good look at the individual stars in this object, use an aperture of 10 inches. You'll find this cluster 2.4° east of magnitude 4.9 Epsilon (ϵ) Scuti.

OBJECT #562	Barnard 114 through Barnard 118
Constellation	Scutum
Right ascension	18h53m
Declination	-6°58'
Size	6'
Type	Dark nebulae

This complex of dark nebulae lies 1.8° south-southwest of magnitude 4.8 Eta (η) Scuti. Alternatively, you can find its northern edge 0.5° southeast of the Wild Duck Cluster (Object #559). From there, the darkness drifts southward some two Full Moon widths. Best results come through telescope/eyepiece combinations that yield approximately 75 \times .

OBJECT #563	IC 1296
Constellation	Lyra
Right ascension	18h53m
Declination	33°03'
Magnitude	14.8
Size	0.9' by 0.5'
Type	Barred spiral galaxy

Before you attempt to observe IC 1296, please note both its extremely faint magnitude and its small size. If you're still interested then you must love challenge objects. You also must have at least a 16-inch telescope under a dark sky.

First, find the Ring Nebula (M57). Then gently nudge your scope 4' to the northwest. Finally, crank up the magnification past 250 \times , and look for the tiny, round galaxy. Don't expect to see even a hint of its bar or arms.

OBJECT #564	M54 (NGC 6715)
Constellation	Sagittarius
Right ascension	18h55m
Declination	-30°29'
Magnitude	7.6
Size	9.1'
Type	Globular cluster

Our next treat lies 1.7° west-southwest of magnitude 2.6 Ascella (Zeta [ζ] Sagittarii). Although its total magnitude is bright, M54's stars only resolve through the largest amateur telescopes. That's because it lies 87,000 light-years away, making it the most distant globular cluster in Charles Messier's catalog. Its brightest stars shine at only magnitude 15.5.

Through a 12-inch telescope, M54's center appears broad and bright. A razor-thin halo surrounds it, but you'll need to crank up the magnification past 350 \times to see it.

OBJECT #565	NGC 6716
Constellation	Sagittarius
Right ascension	18h55m
Declination	-19°54'
Magnitude	7.5
Size	10'
Type	Open cluster

This object sits 1° northwest of magnitude 5.0 Xi¹ (ξ^1) Sagittarii, and it's one I put into the class I call the "great equalizer" clusters. That means NGC 6716 looks as good through a 4-inch telescope as it

does through a 12-inch one. Sure, you may see more ultra-faint stars when you use a larger aperture, but the essence of the cluster will be the same.

So, through a 4-inch or larger scope, you'll see two distinct groupings of stars with a gap between them. A curved arc of half a dozen 9th- and 10th-magnitude stars sits to the north, and a second group whose shape reminds me of the Coathanger (Object #592) lies to the southwest. Adding a splash of color is the orange magnitude 7.0 star SAO 161947, which lies 12' to the west-northwest of NGC 6716's center.

OBJECT #566	NGC 6717
Constellation	Sagittarius
Right ascension	18h55m
Declination	-22°42'
Magnitude	8.4
Size	5.4'
Type	Globular cluster

Our next object lies 1.7° south-southwest of magnitude 3.5 Xi² (ξ²) Sagittarii. When you arrive at that location, however, you'll encounter a problem: Magnitude 5.0 Nu² (ν²) Sagittarii lies less than 2' north of our target. Through small telescopes, the globular appears as a hazy patch near the star. Be sure to crank the power up to at least 200× to put some separation between the two objects.

At that magnification, or through a larger scope like the 12-inch with which I last observed NGC 6717, you'll first spot several foreground stars, the brightest of which shines at magnitude 11.7. Those stars seem superimposed on a nebulous background glow, and that's what you're trying to see. I think of Bruce Lee's instruction to his student in the 1973 movie *Enter the Dragon*: "It's like a finger pointing the way to the Moon. Don't concentrate on the finger, or you'll miss all that heavenly glory."

NGC 6717 carries another astronomical designation — Palomar 9. In fact, it's the brightest (by more than a magnitude) of any from that relatively obscure list of 15 deep-sky targets. For more difficult quarry, try Palomar 12 (Object #688).

OBJECT #567	M57 (NGC 6720)
Constellation	Lyra
Right ascension	18h54m
Declination	33°02'
Magnitude	9.7
Size	71"
Type	Planetary nebula
Other name	The Ring Nebula

Our next object, the Ring Nebula — also known as M57 — is a great target for small telescopes.

Through a small telescope (one with a mirror or lens 4 inches [100 mm] across or smaller), you'll see the Ring Nebula as a pale grey ball. If you use a magnification greater than 100×, you'll notice the outer part of the ball looks thicker than the central region. This gives M57 its distinctive "ring" appearance.

The Ring Nebula lies in the direction of the constellation Lyra the Harp, which we see best during the Northern Hemisphere's summer and fall. The main part of Lyra is one brilliant star — Vega — and a crooked box of four fainter stars nearby. On a star chart (and then in the sky), locate Beta (β) Lyrae and Gamma (γ) Lyrae. These two stars make the end of the box that lies farthest from Vega. Roughly midway between them, you'll find the Ring Nebula.

Spotting M57's central star ranks as a difficult observing challenge that will test you, your telescope, and the quality of your observing site. Through a 16-inch or larger telescope on a night of excellent seeing, use an eyepiece that yields between 300× and 400×. Keep in mind you're searching for a 15th-magnitude star against a background that's not completely dark. If the central star doesn't show itself immediately, slightly tap on the telescope's tube. At such high magnification, tapping with one finger

should do. Because the human eye is sensitive to motion, you may see the white dwarf at this point. German astronomer Friedrich von Hahn discovered the star in 1800.

OBJECT #568	Theta (θ) Serpentis
Constellation	Serpens
Right ascension	18h56m
Declination	4° 12'
Magnitudes	4.5/5.4
Separation	22.3"
Type	Double star
Other name	Alya

You'll find Theta Ser 7.4° west of magnitude 3.4 Delta (δ) Aquilae. The brighter component is blue, and its companion is a pale yellow.

According to Allen in *Star-Names and Their Meanings*, the common name Alya is from the same source as Unukalhai (Alpha [α] Serpentis), which also carried the names Alioth, Alyah, and Alyat. Allen says that each of these is a term "for the broad and fat tail of the Eastern sheep that may have been at some early day figured here in the Orientals' sky." He goes on to say, however, that they most likely derive from "Al Hayyah," which means "the snake."

OBJECT #569	NGC 6723
Constellation	Sagittarius
Right ascension	19h00m
Declination	-36° 38'
Magnitude	7.9
Size	11.0'
Type	Globular cluster
Other name	The Chandelier Cluster

Our next target sits 0.5° north-northeast of magnitude 4.8 Epsilon (ϵ) Coronae Australis, within a region rich in reflection nebulosity. In fact, Objects #571 and #572 sit 0.5° and 0.6° east-southeast of this globular.

Through an 8-inch telescope at 200 \times , you'll see a large, concentrated core that exhibits mottling (alternating bright and dark regions). Two dark gaps lie at the cluster's southwestern edge.

Through a 14-inch scope, crank the magnification up to 300 \times , and you'll see NGC 6723's irregular shape plus many more individual stars. Do you see the draping arcs of stars for which this globular got its popular name the Chandelier Cluster? A 16-inch scope will reveal more than 100 faint points of light. The brightest star in view glows at magnitude 10.4 and lies 3' from the cluster's center.

OBJECT #570	IC 1295
Constellation	Scutum
Right ascension	18h55m
Declination	-8° 50'
Magnitude	~12
Size	86"
Type	Planetary nebula

Our next planetary nebula is brighter than its listed magnitude would lead you to believe. The reason is IC 1295's relatively high surface brightness. At only 1.5' across, it doesn't spread out its light far. Telescopes as small as 6' in diameter will show its disk shape. With a larger scope, the nebula's irregular nature becomes more apparent.

You'll find this object 4.8° east of magnitude 3.9 Alpha (α) Scuti and only 0.4° east-southeast of NGC 6712 (Object #561).

OBJECT #571	NGC 6726
Constellation	Corona Australis
Right ascension	19h02m
Declination	-36°53'
Size	9' by 7'
Type	Reflection nebula

Our next target lies in the small constellation Corona Australis the Southern Crown. You'll find it 1° west of magnitude 4.2 Gamma (γ) Coronae Australis.

NGC 6726 shines by reflecting the light of TY Coronae Australis, a variable star that ranges between magnitude 8.8 and magnitude 12.6. Because reflected starlight is made up of all wavelengths of light, don't use any filter when observing this nebula.

In fact, this entire region abounds with bright and dark nebulosity. While NGC 6726 is the brightest area, don't ignore our next object, NGC 6729.

Finally, a much brighter treat awaits you only 0.5° to the west-northwest of NGC 6729. There, you'll find the bright globular cluster NGC 6723 (Object #569), which sits over the border into Sagittarius. This object shines at magnitude 7.9 and measures 11' across.

OBJECT #572	NGC 6729
Constellation	Corona Australis
Right ascension	19h02m
Declination	-36°57'
Size	1' by 1'
Type	Emission nebula
Other name	Caldwell 68

NGC 6729 sits only 5' to the southeast of our previous target, NGC 6726. This nebula glows more faintly than NGC 6726, but it's at least as interesting (if not more so) because it contains another variable star — R Coronae Australis. This star's brightness varies from magnitude 9.7 to about magnitude 12.

Many observers have noted NGC 6729's distinct, cometary shape. See if you don't agree. Through a 12-inch telescope at 200 \times , you'll see the reflection nebula extending away from R Coronae Australis. NGC 6729 appears five times as long as it is wide.

OBJECT #573	NGC 6738
Constellation	Aquila
Right ascension	19h01m
Declination	11°36'
Magnitude	8.3
Size	15'
Type	Open cluster

You'll find our next target 2.5° south-southwest of magnitude 3.0 Zeta (ζ) Aquilae. A 4-inch telescope will pick up perhaps two dozen stars in this area, but many fainter points await revealing through larger apertures. The two brightest stars, magnitude 9.0 SAO 104365 and magnitude 9.2 SAO 104371, lie at the cluster's center and align east-west.

Now here's the kicker: NGC 6738 is not an actual open cluster. In 2003, a team of five researchers concluded that "NGC 6738 is definitely not a physical stellar ensemble: photometry does not show a defined mean sequence, proper motions and radial velocities are randomly distributed, spectrophotometric parallaxes range between 10 and 1600 pc, and the apparent luminosity function is identical to that of the surrounding field. NGC 6738 therefore appears to be an apparent concentration of a few bright stars projected on patchy background absorption." — The Smithsonian/NASA Astrophysics Data System.

I hope that such a conclusion, rather than causing you to cross this object off the list, actually makes you want to go out and observe it. Go see the “cluster” that fooled astronomers for so long. How does it appear to you? Even knowing the end result, it’s hard for most observers to classify NGC 6738 as anything but another of the sky’s intriguing open clusters.

OBJECT #574	NGC 6741
Constellation	Aquila
Right ascension	19h03m
Declination	-0°27'
Magnitude	11.4
Size	6''
Type	Planetary nebula
Other name	The Phantom Streak

Here’s a tough catch for those with telescopes with apertures less than 11 inches across. You’ll find it 4.5° north-northwest of magnitude 3.4 Lambda (λ) Aquilae. It shows up at low magnifications as a dim “star” that jumps into view when a nebula filter is placed in front of the eyepiece. Actually, it’s all the other stars dimming because of the filter, but the effect is the same.

For the Phantom Streak, however, high magnification is the way to go. Through a 12-inch telescope at 300 \times , the tiny disk becomes apparent when you compare it to the half dozen or so other similarly bright stars in the field of view. And here’s another thing you can look for through this size scope: color. I can pick up an ever-so-faint robin’s-egg blue, although it’s easier to spot when I drop the magnification to 200 \times . Through larger telescopes, like the 30-inch reflector I used in June 2009 at Rancho Hidalgo in Animas, New Mexico, NGC 6741’s color isn’t in doubt.

It’s easy to see why the Phantom Streak Nebula has its common name. It appears faint, and, through a small telescope, the only way you might see it is to use averted vision, thereby only occasionally viewing the “streak.” Unfortunately, I have been unable to find out who bestowed this object’s moniker on it.

OBJECT #575	NGC 6742
Constellation	Draco
Right ascension	18h59m
Declination	48°28'
Magnitude	13.4
Size	30''
Type	Planetary nebula
Other name	Abell 50

Our next target is the neglected planetary nebula NGC 6742, which lies near Draco’s southern borders with Cygnus and Lyra. Although its magnitude implies that it’s quite faint, it has a surface brightness high enough for you to easily view it through a 10-inch telescope. It appears as a sharp-edged, round disk. Increase the magnification, and try to spot the ring structure in this object.

This object doesn’t lie close to any bright star. To find NGC 6742, first find the magnitude 5.0 star 16 Lyrae. Then look 1.5° north-northwest.

OBJECT #576	IC 4808
Constellation	Corona Australis
Right ascension	19h01m
Declination	-45°19'
Magnitude	12.9
Size	1.9' by 0.8'
Type	Spiral galaxy

You'll find this galaxy right on Corona Australis' southern border with Telescopium. The easiest way to find it is to look 3.9° west-southwest of magnitude 4.9 Beta¹ (β^1) Sagittarii. IC 4808 represents one of the faintest targets in the 1,001 Objects, so this one's best suited for large-scope users. Still, catching it through a 6-inch telescope under a dark, steady sky makes a noteworthy observation.

Through a 14-inch scope at $200\times$, you'll see an oval glow twice as long as it is wide, oriented northeast to southwest, with a slightly brighter, evenly illuminated central area. Crank the power up to $350\times$, and the outer region's even brightness distribution begins to break down, especially at the southwestern end. That's the telltale sign of spiral structure, although you won't see this galaxy's arms through amateur instruments.

OBJECT #577	NGC 6744
Constellation	Pavo
Right ascension	19h10m
Declination	$-63^\circ 51'$
Magnitude	8.6
Size	15.5' by 10.0'
Type	Spiral galaxy
Other name	Caldwell 101

For most readers, seeing this wonder will require a trip south of the border. The constellation Pavo the Peacock sits so far south it butts up against Octans, the star figure that surrounds the South Celestial Pole. From Miami, NGC 6744 climbs less than 0.5° above the horizon.

Scottish-born Australian astronomer James Dunlop discovered NGC 6744 between 1823 and 1827, and made it number 262 in *A Catalogue of Nebulae and Clusters of Stars in the Southern Hemisphere observed in New South Wales (Philosophical Transactions of the Royal Society, volume 118, 1828)*. Dunlop's catalog contained 629 deep-sky objects.

Although NGC 6744 exceeds 9th magnitude, its surface brightness is low, as in the case of M101. In fact, to see NGC 6744's spiral arms, you'll need at least a 10-inch telescope. Through it, you'll see the galaxy's oval shape; the halo is about 50-percent longer than wide. The outer reaches (the spiral arms) appear clumpy due to large, massive star clusters. Find a 20-inch scope to peer through, perhaps at a star party, and this galaxy's structure will amaze you.

To find NGC 6744, look 2.6° southeast from magnitude 4.2 Lambda (λ) Pavonis.

OBJECT #578	NGC 6745
Constellation	Lyra
Right ascension	19h02m
Declination	$40^\circ 45'$
Magnitude	12.3
Size	1.4' by 0.7'
Type	Irregular galaxy

Our next target isn't hard to spot through medium-size telescopes because of its high surface brightness, but, admittedly, you won't see a lot of detail. The disk is uniformly bright and no halo or spiral arms are visible. Can you spot the magnitude 14 star that sits in front of the galaxy's northern tip? NGC 6745 lies 2.8° northwest of magnitude 4.4 Eta (η) Lyrae.

Owners of large telescopes would do well to spend some time observing this galaxy at high power. The galaxy orients north-south, but its western edge is straight. Compare it to the eastern edge, which puffs out like a normal galaxy. This odd shape is the result of a collision between NGC 6745 — a former spiral — and another, smaller galaxy. Deep exposures through large telescopes show regions of star formation triggered by this collision.

OBJECT #579	Bernes 157
Constellation	Corona Australis
Right ascension	19h03m
Declination	-37°08'
Size	55' by 18'
Type	Dark nebula

Look midway between magnitude 4.8 Epsilon (ϵ) Coronae Australis and magnitude 4.2 Gamma (γ) Coronae Australis to find the dark nebula Bernes 157. This ultra-dark spot sits at the southeastern edge of the region inhabited by NGC 6726 (Object #571) and NGC 6729 (Object #572). Also, less than 1° to the northwest, you'll find NGC 6723 (Object #569). Magnitude 4.2 Gamma (γ) Coronae Australis lies at the nebula's northern edge.

Visual absorption of starlight in this region is as high as 8 magnitudes, so you'll need a large aperture to capture the few 13th-magnitude stars strewn across Bernes 157. I find it fascinating that dark nebulae blot out starlight because, in say 10 million years, this star-forming region will be alive with new stars.

The best views of Bernes 157 are through either large-aperture binoculars that magnify at least 15 times, or through telescope/eyepiece combinations that yield magnifications between 30× and 50×. Remember, this dark patch isn't small. It covers an area almost as large as two Full Moons.

This object's catalog name is one you may not have heard of. In 1977, Claes Bernes of the Stockholm Observatory compiled a new catalogue of bright nebulae in dense dust clouds. He found 160 such objects in 80 different dark clouds when he searched on Palomar Sky Survey plates. That survey allowed him to find nebulae to a declination of -46°. For more southerly objects, Bernes turned to the just-completed European Southern Observatory "blue" survey. Most of these objects are reflection nebulae, and all are star-forming regions Bernes suggested astronomers target for future study by radio and infrared observations.

OBJECT #580	NGC 6749
Constellation	Aquila
Right ascension	19h05m
Declination	1°54'
Magnitude	12.4
Size	6.3'
Type	Globular cluster

If you're a beginning observer, I hope you didn't flip through this book at random, looking to observe your first object, and land on this page. If so, please accept my apology, and pick something else. Save this challenge for a time when you're more seasoned.

You'll find this large-telescope target 5.2° west-southwest of magnitude 3.4 Delta (δ) Aquilae. Don't be discouraged if you don't spot it immediately because this is one of the least-concentrated globular clusters known. It lies at a distance of 24,000 light-years, so material in the Milky Way's plane dims its light by more than 4 magnitudes. Its brightest stars glow at magnitude 16.

Through a 12-inch telescope, you'll detect NGC 6749 as a soft haze. Step up to a 20-inch scope, and NGC 6749 still appears faint. You will, however, be able to distinguish between the slightly brighter central region and the oh-so-faint halo. Observers rate this globular as one of the two most difficult to spot in Dreyer's *New General Catalogue*. The other is NGC 6380 (Object #489).

OBJECT #581	NGC 6751
Constellation	Aquila
Right ascension	19h06m
Declination	-6°00'

(continued)	
Magnitude	11.9
Size	20'
Type	Planetary nebula

Our next object sits 1.1° south of magnitude 3.4 Lambda (λ) Aquilae. Through a 14-inch telescope, you'll see magnitude 12.9 GSC 5140:3169 shining less than 1' to the east and a magnitude 13.2 star half that distance to the west. At $250\times$, the tiny planetary looks slightly uneven in its overall illumination.

If you can't detect the magnitude 14.5 central star at this magnification, increase it past $350\times$, and you'll have no problem. For a different perspective, back the power down past $150\times$, and examine this object against the rich Milky Way background. At what magnification can you no longer tell NGC 6751 is non-stellar?

OBJECT #582	NGC 6752
Constellation	Pavo
Right ascension	19h11m
Declination	$-59^\circ 59'$
Magnitude	5.5
Size	20.4'
Type	Globular cluster
Other names	The Pavo Globular, the Starfish, the Windmill, Caldwell 93

You'll spot one of the sky's brightest globular clusters — tied for 4th-brightest with NGC 6397 in Ara (Object #493) — easily with your naked eyes from a dark site. Look for it 3.2° northeast of magnitude 4.2 Lambda (λ) Pavonis. This cluster appears big and bright for the reason you'd think — it's close. NGC 6752 lies only 13,000 light-years from Earth.

Through any optics, this is a spectacular sight. A 6-inch telescope reveals hundreds of stars orbiting a broad, concentrated core. The brightest star sits in the foreground. That's magnitude 7.4 SAO 254482, and it sits just 4' south-southwest of the cluster's center. Several — no, many — starry chains radiate in various directions from the center, giving NGC 6752 two of its popular names.

One of those names, the Starfish, appears two other times in this book. Amateur astronomers refer to another globular, NGC 6544 (Object #521), and open cluster M38 (Object #948) both as the Starfish Cluster.

OBJECT #583	NGC 6755
Constellation	Aquila
Right ascension	19h08m
Declination	$4^\circ 14'$
Magnitude	7.5
Size	14'
Type	Open cluster

Our next object lies 2.9° east of magnitude 4.5 Theta (θ) Serpentis. Through a 6-inch telescope at $125\times$, you'll have no trouble picking the cluster out from the Milky Way background, although it is loose. Note the two distinct groups of 11th- and 12th-magnitude stars split by a dark lane that stretch from east to west. The southern half of the cluster slightly outshines the northern section. You'll also find the cluster's two brightest stars, which shine at magnitude 10.4, south of center. Through 12-inch and larger telescopes, look around for many yellow and orange stars that populate this region and offer a nice color contrast.

OBJECT #584	NGC 6756
Constellation	Aquila
Right ascension	19h09m
Declination	4°41'
Magnitude	10.6
Size	4'
Type	Open cluster

You'll find this target 0.5° north-northeast of our previous item, NGC 6755 (Object #583). Through a 6-inch telescope at $125\times$, look for a grouping of about 10 stars that concentrate over an ephemeral background glow. A 14-inch scope resolves the background glow, but not into multitudes of stars, only about two dozen of them.

OBJECT #585	NGC 6760
Constellation	Aquila
Right ascension	19h11m
Declination	1°02'
Magnitude	9.1
Size	6.6'
Type	Globular cluster

Look for this object 1.8° west of the magnitude 5.1 star 23 Aquilae. A 10-inch telescope at $200\times$ reveals a broadly concentrated disk with even illumination but little stellar resolution. A 14-inch scope does a bit better, resolving a handful of faint points and also bringing out the halo's mottled structure.

OBJECT #586	NGC 6765
Constellation	Lyra
Right ascension	19h11m
Declination	30°33'
Magnitude	12.9
Size	38''
Type	Planetary nebula

This faint, small planetary nebula lies 0.8° south of the magnitude 5.9 star 19 Lyrae. Through large telescopes at magnifications above $250\times$, it appears elongated in a northeast-southwest direction. An OIII filter helps a lot, but don't expect to see much structure. Without a filter, try to spot the 14th-magnitude star that sits off NGC 6765's northeast side. Two 12th-magnitude stars sit 3' and 4' south, respectively. Visually, the nebula's relatively high surface brightness swamps the 16th-magnitude central star.

OBJECT #587	NGC 6772
Constellation	Aquila
Right ascension	19h15m
Declination	-2°42'
Magnitude	12.7
Size	62''
Type	Planetary nebula

Scan 3° northeast of magnitude 3.4 Lambda (λ) Aquilae to locate the large planetary nebula NGC 6772. It's a tough catch through a 6-inch telescope, but a 12-inch instrument at $250\times$ shows it as circular with a hazy edge.

Larger scopes and higher magnifications show a slight north-south elongation. Several faint stars are superimposed on this object's face, but they add to the view rather than detracting from it. A nebula filter is a must for this object.



Object #588 M56 Anthony Ayiomamitis

OBJECT #588	M56 (NGC 6779)
Constellation	Lyra
Right ascension	19h17m
Declination	30°11'
Magnitude	8.3
Size	7.1'
Type	Globular cluster

Lying 45 percent of the way from Albireo (β) Cygni to Gamma (γ) Lyrae, the 56th entry in Charles Messier's catalog is easy to find. From a dark site, you'll spot it through binoculars.

The density of stars in M56 increases dramatically as you move toward its core. And, because the individual cluster stars aren't all that bright, you'll resolve them best through 8-inch or larger telescopes and at magnifications exceeding 150 \times . When you're done examining the inner workings of M56, back off the power, and enjoy the star field in which this cluster sits.

OBJECT #589	IC 1297
Constellation	Corona Australis
Right ascension	19h17m
Declination	-39°37'

(continued)	
Magnitude	10.7
Size	7"
Type	Planetary nebula

Our next object lies 1.4° east of magnitude 4.1 Beta (β) Coronae Australis. Through an 8-inch telescope at $200\times$, this planetary still is tiny. At $300\times$, it appears as a square with rounded edges. A nebula filter helps a lot, but be sure to view it without the filter so you can see the blue, bluish-green, or greenish-blue color. Exactly which hue you see depends on your eyes' color receptors. Through a 20-inch telescope at magnifications above $400\times$, look for a slight north-south elongation.

OBJECT #590	NGC 6781
Constellation	Aquila
Right ascension	19h18m
Declination	$6^\circ 33'$
Magnitude	11.4
Size	109"
Type	Planetary nebula

Although Aquila ranks 22nd in size among the 88 constellations, it contains no Messier objects or emission nebulae and few bright star clusters. Still, you'll want to point your telescope 3.8° north-northwest of magnitude 3.4 Delta (δ) Aquila to observe NGC 6781.

NGC 6781 is an almost perfect bubble of gas cast off by a single, formerly Sun-like, star that has died. The bubble continues to expand; it measures some 2 light-years across. Energetic photons from nearby bright stars decompose the gas bubble. A similar process occurs within the Eagle Nebula (M16).

Through a 6-inch telescope at $100\times$, NGC 6781 stands out well against a rich, star-filled background. The disk appears soft, irregular, and oval-shaped with a slightly darker center. If the seeing at your observing site is good, look for small, dark blotches over NGC 6781's face.

If you're able to observe this planetary through a 16-inch scope, you'll see lots of structure in NGC 6781's thick ring. This feature's southern rim appears brightest. The northern edge is broken and gradually fades into the background. To see the ring best, use a nebula or an OIII filter. Through this size or larger telescope, you might detect the central star, a bluish white dwarf, which glows weakly at magnitude 16.2.

OBJECT #591	NGC 6791
Constellation	Lyra
Right ascension	19h21m
Declination	$37^\circ 51'$
Magnitude	9.5
Size	15'
Type	Open cluster

NGC 6791 is a pretty cluster that lies less than 1° east-southeast of magnitude 4.4 Theta (θ) Lyrae. Its size — nearly half the diameter of the Full Moon — means that, even at magnitude 9.5, NGC 6791 appears faint through small telescopes. In fact, you may be fooled into thinking it's a globular cluster.

Through 16-inch and larger instruments, NGC 6791 begins to strut its stuff. Dozens of faint cluster stars begin to resolve into a fine, evenly distributed pile of diamond-dust.

OBJECT #592	Collinder 399
Constellation	Vulpecula
Right ascension	19h25m
Declination	20°11'
Magnitude	3.6
Size	60'
Type	Asterism
Other names	The Coathanger, Brocchi's Cluster, Al Sufi's Cluster

To find out next object, use binoculars or a finder scope and extend a line southward from magnitude 3.0 Albireo (Beta [β] Cygni) through magnitude 4.4 Alpha (α) Vulpeculae. That distance is roughly 3° . Head 4.5° farther south, and you'll encounter Collinder 399.

This group was the 399th entry in a catalog of open clusters compiled by Swedish astronomer Per Arne Collinder. His catalog contains 471 objects. It's most common name, the Coathanger, comes from its shape.

Its other common names derive from astronomers. Persian astronomer Al Sufi (A.D. 903–986) was discovered this object and included it in his *Book of Fixed Stars*, which he published in A.D. 964.

American Dalmiro Francis Brocchi (1871–1955) was an amateur astronomer and chartmaker for the American Association of Variable Star Observers (AAVSO). In the 1920s, he created a map of this region so that astronomers could calibrate their photometers.

Because it's so big, the Coathanger looks best at magnifications of $20\times$ or less. Ten stars glow brighter than 7th magnitude, so the group appears distinct to the naked eye on dark nights. The brightest are 4 Vulpeculae, at magnitude 5.1, 5 Vulpeculae, at magnitude 5.6, and 7 Vulpeculae, which shines at magnitude 6.3.

OBJECT #593	NGC 6800
Constellation	Vulpecula
Right ascension	19h27m
Declination	25°08'
Magnitude	9.0
Size	5'
Type	Open cluster

Our next object lies only $35'$ northwest of magnitude 4.4 Alpha (α) Vulpeculae. This small cluster looks best through 8-inch or larger telescopes. Expect to see 50 stars scattered haphazardly across the field of view. Two stars, magnitude 7.1 SAO 87256, and magnitude 8.0 SAO 87200 flank the cluster on its east and west sides, respectively.

OBJECT #594	NGC 6802
Constellation	Vulpecula
Right ascension	19h31m
Declination	20°16'
Magnitude	8.8
Size	3.2'
Type	Open cluster

You'll find NGC 6802 at the east end of the Coathanger (Object #592). Through a small telescope, or at low power, it appears as a bright but unresolved haze. Large scopes don't reveal much more. Through a 12-inch scope at $200\times$, you'll barely count two dozen stars.

OBJECT #595	Beta (β) Cygni
Constellation	Cygnus
Right ascension	19h31m
Declination	27°58'
Magnitudes	3.1/5.1
Separation	34''
Type	Double star
Other name	Albireo

When you're observing faint objects in the fall, take a break. Point a small telescope at Albireo (Beta [β] Cygni). Most northern observers consider this the sky's finest double star.

Although the first two letters of Albireo are "al," according to Richard Hinckley Allen, this star's name is not Arabian. He says the now universal title, "apparently was first applied to the star from a misunderstanding as to the words *ab ireo* in the description of the constellation in the 1515 *Almagest*." The Arabians called Albireo *Al Minhar al Dajajah*, the Hen's Beak.

Astronomers label Albireo's two components β^1 Cygni and β^2 Cygni. β^1 shines at magnitude 3.4, while β^2 is fainter, coming in at magnitude 5.1. But it's not their magnitudes that make these stars a terrific sight: It's their colors.

Before I describe the colors of these two stars, let me reiterate that no two human eyes see precisely the same hues. That said, most observers "see" β^1 as golden and β^2 as sapphire blue. Whether you see gold and blue, blue and white, yellow and green, or any number of other combinations, it all adds up to a strikingly different pair. Don't miss it.

OBJECT #596	NGC 6804
Constellation	Aquila
Right ascension	19h32m
Declination	9°13'
Magnitude	12.0
Size	31''
Type	Planetary nebula

Our next target lies almost 2° north-northwest of magnitude 4.5 Mu (μ) Aquilae. Although its magnitude suggests that it's faint, a 6-inch telescope easily reveals its disk. At 200 \times , the planetary appears diffuse. A nebula filter improves the view, especially through 12-inch or larger telescopes. You'll see the incomplete ring structure around the 14th-magnitude central star. It's brightest north and south of the star. Two other stars appear at the planetary's western and northeastern edges.

OBJECT #597	M55 (NGC 6809)
Constellation	Sagittarius
Right ascension	19h40m
Declination	-30°58'
Magnitude	6.3
Size	19.0'
Type	Globular cluster

Our next treat comes from Charles Messier's catalog. M55 is a superb globular you may just spot with your naked eye from an ultra-dark site. Observers describe this cluster as "highly resolved." That means its core doesn't appear packed with stars, which often gives a "burned out" effect.

A 12-inch telescope at 300× will break it into hundreds of 11th and 12th-magnitude stars. Through an eyepiece with a small field of view, M55 may appear more like a rich, open cluster.

You'll find M55 8° east of magnitude 2.6 Ascella (Zeta [ζ] Sagittarii).

OBJECT #598	Barnard 143
Constellation	Aquila
Right ascension	19h41m
Declination	11°01'
Size	40'
Type	Dark nebula
Other name	Barnard's E

Our next treat is one of my all-time favorite binocular objects. Barnard's E, a combo of two dark nebulae from Edward Emerson Barnard's famous catalog, lies against the rich Milky Way in Aquila. Start at yellow, magnitude 2.7 Tarazed (Gamma [γ] Aquilae). If you center Tarazed, you shouldn't have to move your binoculars at all. Barnard's E lies 1.4° west-northwest of the star.

Barnard 143 (often designated B143) is easiest of the pair to spot. It's a narrow bar about 15' long, oriented east-west. Two, slightly less distinct dark bars connect to it and form a U-shape. Just to the south lies Barnard 142 (B142), another dark nebula not quite as long and only one-third as wide, making it more difficult to see. Behind all these dark clouds, you'll see thousands of unresolved points of light.

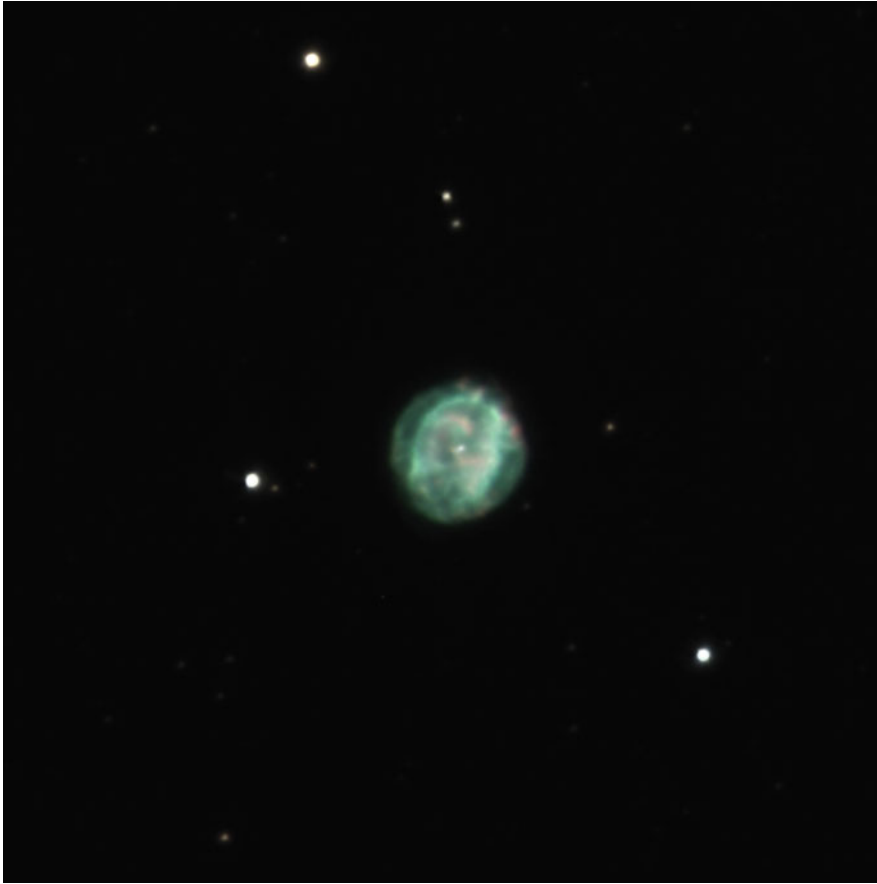
OBJECT #599	NGC 6810
Constellation	Pavo
Right ascension	19h44m
Declination	-58°40'
Magnitude	11.4
Size	3.8' by 1.2'
Type	Spiral galaxy

To find our next treat, first locate magnitude 1.9 Peacock (Alpha [α] Pavonis). Then move not quite 6° west-southwest. NGC 6810 is an edge-on spiral that doesn't show much detail. Through a 12-inch telescope, all you'll see is a bright streak twice as long as it is wide, elongated north-south. Its bright central region appears evenly illuminated. At magnifications above 250×, you may spot the thin halo around the core.

OBJECT #600	NGC 6811
Constellation	Cygnus
Right ascension	19h37m
Declination	46°23'
Magnitude	6.8
Size	15'
Type	Open cluster

I've tried to see this object with my naked eye, but the star field it's in is too rich. It's easy through binoculars, however, it's best at magnifications above 100×. A 4-inch telescope will reveal 50 stars, and through an 8-inch scope, you'll see twice that many distributed unevenly across NGC 6811's face.

To find this cluster, move 1.8° northwest from magnitude 2.9 Delta (δ) Cygni.



Object #601 The Little Gem (NGC 6818) Mitch and Michael Dye/Adam Block/NOAO/AURA/NSF

OBJECT #601	NGC 6818
Constellation	Sagittarius
Right ascension	19h44m
Declination	-14°09'
Magnitude	9.3
Size	48''
Type	Planetary nebula
Other names	The Little Gem, the Green Mars Nebula

This treat sits in a no man's land bereft of bright stars near the Archer's northern border with Aquila. Look for this small planetary nebula 9° due west of 3rd-magnitude Beta (β) Capricorni. Although stellar luminaries in this part of the sky are scarce, this is a great area for deep-sky treats. The Little Gem lies only 0.7° north-northwest of Barnard's Galaxy (NGC 6822). Talk about two objects that are on the opposite ends of the surface brightness spectrum!

As luck would have it, the Little Gem is the bright one. It shines at magnitude 9.3 and measures roughly $0.8'$ across from north to south and a bit less from east to west. The combination of brightness and size means NGC 6818's surface brightness is high, and you can really crank up the magnification.

The greenish-blue color most observers see appears best at around $100\times$. Above that power, look for this object's ever-so-slightly darker inner half.

Observers began to refer to this planetary as the Green Mars Nebula when they noticed its size through a small telescope ($22''$, less than half its listed diameter) equaled that of Mars when the Red Planet approaches closest to the Sun.

OBJECT #602	NGC 6819
Constellation	Cygnus
Right ascension	19h41m
Declination	$40^{\circ}11'$
Magnitude	7.3
Size	$5'$
Type	Open cluster
Other names	The Fox Head Cluster, the Octopus Cluster

Our next target lies 5° south of magnitude 3.0 Delta (δ) Cygni. It's a small, but bright open cluster that takes magnification well. Through a 4-inch telescope at $150\times$, you'll see more than two dozen stars. They're not evenly distributed because the northern half of the cluster appears brighter than the southern half. Double the aperture to $8'$, and you'll count 50 stars. Double it again, and more than 100 stars are yours for the picking.

Many observers see a "V" in the cluster's brightest stars (usually at low magnification). Because a fox has a triangular head, amateur astronomers began calling NGC 6819 the Fox Head Cluster. *Astronomy* magazine Contributing Editor Stephen James O'Meara goes a step farther, however. Rather than a V, O'Meara sees a weak Greek letter Chi (χ). At low powers, he maintains the X shape has angular extensions that give the cluster a spiral shape, which he likens to that of an octopus.

OBJECT #603	NGC 6820
Constellation	Vulpecula
Right ascension	19h43m
Declination	$23^{\circ}17'$
Size	$40'$ by $30'$
Type	Emission nebula

Our next target lies 3.5° east-southeast of magnitude 4.4 Alpha (α) Vulpeculae. Screw a nebula filter into your eyepiece to dim the stars of NGC 6820's associated cluster, NGC 6823. Any trace of nebulosity you see through a 6-inch telescope is a great catch. Usually, a 12-inch scope is the minimum required.



Object #604 Barnard's Galaxy (NGC 6822) Julie and Jessica Garcia/Adam Block/NOAO/AURA/NSF

OBJECT #604	NGC 6822
Constellation	Sagittarius
Right ascension	19h45m
Declination	-14°48'
Magnitude	8.8
Size	19.1' by 14.9'
Type	Irregular galaxy
Other names	Barnard's Galaxy, Caldwell 57

If you use an 8-inch or larger telescope, insert the eyepiece that gives you the widest field of view, and look for Barnard's Galaxy, also known as NGC 6822. This object lies in Sagittarius 1.5° north-northeast of 5th-magnitude 55 Sagittarii. In 1881, American astronomer Edward Emerson Barnard discovered this object through a 6-inch refractor.

Barnard's Galaxy shines at magnitude 9.3 — pretty bright for a galaxy. Unfortunately, its light spreads out over an area 16' by 14', so its overall surface brightness is low.

Look for a dim haze roughly twice as long as it is wide. Note the slightly brighter streak that spans NGC 6822's long axis.

Larger scopes show several star-forming regions along the galaxy's northern end. To see just these, use a nebula filter. Without a filter, and through a 12-inch or larger scope, look for individual supergiant stars. They're faint — the brightest glow at only 14th magnitude — but they reveal themselves by lending a granular appearance to the galaxy.

OBJECT #605	NGC 6823
Constellation	Vulpecula
Right ascension	19h43m
Declination	23°18'
Magnitude	7.1
Size	12'
Type	Open cluster

This object is the open cluster associated with emission nebula NGC 6820. Through a 4-inch telescope, you'll see 20 stars but no trace of the nebula. In fact, without a nebula filter in place, the cluster's brightness overwhelms that of the nebulosity at every aperture. At the center of the cluster lies a tight group of stars you'll have trouble resolving. You'll find this cluster 3.5° east-southeast of magnitude 4.4 Alpha (α) Vulpeculae.

OBJECT #606	NGC 6826
Constellation	Cygnus
Right ascension	19h45m
Declination	$50^\circ 31'$
Magnitude	8.8
Size	25''
Type	Planetary nebula
Other names	The Blinking Planetary, Caldwell 15

Our next object is a fun one to show to other amateur astronomers at star parties. Through 8-inch and smaller telescopes, NGC 6826 appears to blink when an observer views it with direct, and then averted, vision.

The first astronomers to notice this effect were James Mullaney and Wallace McCall at Allegheny Observatory in Pittsburgh. They described the effect in the August 1963 issue of *Sky & Telescope*, page 91. They used the observatory's 13-inch refractor and a magnification of "about $200\times$."

From a dark site, I've used a 6-inch telescope at about $100\times$ to make this object blink. With direct vision, you'll spot the 11th-magnitude central star easily, but the nebula fades. Look a bit to the side (averted vision), and the nebula pops back into view. Furthermore, its apparent brightness under averted vision swamps the stars light. So, by looking back and forth with averted and then direct vision, you can make this object "blink."

You'll find the Blinking Planetary 0.5° east of the magnitude 6.0 star 16 Cygni.

OBJECT #607	IC 4889
Constellation	Telescopium
Right ascension	19h45m
Declination	$-54^\circ 20'$
Magnitude	11.3
Size	2.6' by 1.8'
Type	Spiral galaxy

This elliptical galaxy lies 2° north-northwest of magnitude 5.3 Nu (ν) Telescopii. Through an 8-inch telescope you'll see a featureless oval. A 16-inch scope will divide the bright central region and the faint halo that surrounds it. Through that size scope, look for magnitude 14.3 IC 4888, which lies 8' south.

OBJECT #608	NGC 6830
Constellation	Vulpecula
Right ascension	19h51m
Declination	$23^\circ 04'$
Magnitude	7.9
Size	12'
Type	Open cluster

Our next target lies 0.5° north of the magnitude 4.9 star 12 Vulpeculae. Through a 6-inch scope, you'll see two dozen stars, the brightest of which form a distinct X shape. A 12-inch scope boosts the star count by a dozen.

OBJECT #609	NGC 6834
Constellation	Cygnus
Right ascension	19h52m
Declination	29°25'
Magnitude	7.8
Size	6'
Type	Open cluster

You'll find this small cluster 2.9° east-southeast of magnitude 4.7 Phi (Φ) Cygni. At first glance, it seems a bit unbalanced because the southern half appears brighter than the northern part. At the center of the cluster you'll find its brightest star, magnitude 9.7 HIP 97785.

OBJECT #610	Harvard 20
Constellation	Sagitta
Right ascension	19h53m
Declination	18°20'
Magnitude	7.7
Size	9'
Type	Open cluster

You'll need to look carefully to discern the stars of this cluster. They're the 10 brightest of all the ones you can see in your eyepiece's field of view. What's more, they appear to sit in front of a dizzying array of fainter background stars. The brightest star in the cluster, SAO 105381, shines at magnitude 8.9 and lies in the northeastern quadrant. The easiest way to find Harvard 20 is by dropping 0.5° south-southwest of M71 (our next celestial treat).

This object's catalog identifier comes from a list of star clusters compiled by American astronomer Harlow Shapley (1885–1972) in 1930.



OBJECT #611	M71 (NGC 6838)
Constellation	Sagitta
Right ascension	19h54m
Declination	18° 47'
Magnitude	8.0
Size	7.2'
Type	Globular cluster

Our next target, the loose globular cluster M71, resides midway between magnitude 3.8 Delta (δ) and magnitude 3.5 Gamma (γ) Sagittae, about 1.5° from each. Through a 4-inch telescope at low power, you'll see the bright core surrounded by a fuzz of barely resolved stars. Crank the magnification up to $200\times$, and M71's brightest stars will pop into view. Through a 12-inch scope, the star count passes 50.

OBJECT #612	57 Aquila
Constellation	Aquila
Right ascension	19h55m
Declination	$-8^\circ 14'$
Magnitudes	5.8/6.5
Separation	36''
Type	Double star

You'll find 57 Aql a bit more than 7° northwest of Alpha¹ (α^1) Capricorni. The primary shines twice as brightly as the secondary, and both stars are white.



Object #613 The Dumbbell Nebula (M27) Anthony Ayiomamitis

OBJECT #613	M27 (NGC 6853)
Constellation	Vulpecula
Right ascension	20h00m
Declination	22°43'
Magnitude	7.3
Size	348''
Type	Planetary nebula
Other names	The Dumbbell Nebula, the Apple Core Nebula, the Diablo Nebula, the Double-Headed Shot

Our next object is perfect for those of you who own a small telescope. The Dumbbell Nebula, also known as M27, rides high this month.

Good luck making the shape of a fox out of the stars of the constellation Vulpecula, the star figure that contains the Dumbbell Nebula. The faint star pattern's brightest star is magnitude 4.4 Alpha (α) Vulpeculae.

The Dumbbell Nebula owes its common names to a double-lobe shape common among planetary nebulae. Even through binoculars, this object is easy to spot. To see details in it, set up your telescope.

Small telescopes show the two bright lobes and several stars scattered across M27's face. This object responds well to high magnifications because it has a high surface brightness. Through a large telescope, use an OIII filter, and really crank up the magnification.

OBJECT #614	NGC 6857
Constellation	Cygnus
Right ascension	20h02m
Magnitude	11.4
Declination	33°31'
Size	38.0''
Type	Emission nebula

This small, round emission nebula looks like a planetary nebula, and, in fact, that's how astronomers classified it until 1969. Because of its small size, NGC 6857 has a relatively high surface brightness. If you observe it through a 14-inch or larger telescope, look for an evenly illuminated central region with a faint edge that rapidly fades.



OBJECT #615	M75 (NGC 6864)
Constellation	Sagittarius
Right ascension	20h06m
Declination	-21°55'
Magnitude	8.5
Size	6'
Type	Globular cluster

Our next object is globular cluster M75, which lies 60,000 light-years away. Because of its vast distance, you'll have trouble resolving even its brightest stars through a 12-inch telescope. The core appears bright and stellar at low magnification. Although M75 is in Sagittarius, it's outside the Milky Way's band, so the field is bereft of foreground stars. You'll find it 5° north-northeast of magnitude 4.7 Omega (ω) Sagittarii, next to that constellation's border with Capricornus.

OBJECT #616	NGC 6866
Constellation	Cygnus
Right ascension	20h04m
Declination	44°09'
Magnitude	7.6
Size	7'
Type	Open cluster
Other names	The Frigate Bird Cluster

You'll find our next target 3.4° east-southeast of magnitude 2.9 Delta (δ) Cygni. Even through a 4-inch telescope, this cluster appears rich. A 10-inch scope at 150× shows a "river" of stars oriented east-west running through the cluster's center. Through neither aperture did I see or imagine a frigate bird, but your imagination might be better than mine.

So, where did the common name I list originate? If you guessed it comes from someone who definitely brings a great imagination and a flair for writing about it to the eyepiece, you're right. *Astronomy* magazine Contributing Editor Stephen James O'Meara sees the unmistakable outline of a frigate bird in the stars of NGC 6866.

OBJECT #617	NGC 6868
Constellation	Telescopium
Right ascension	20h10m
Declination	-48°23'
Magnitude	10.6
Size	4.0' by 3.3'
Type	Spiral galaxy

With our next target, you get three for the price of one. Elliptical NGC 6868 is the brightest member of the Telescopium group of galaxies, a small cluster containing 10 members. Through a 12-inch telescope, you'll see an oval elongated east-west. Its bright center fades into a dim halo. Just 6' to the north-northeast lies the magnitude 12.4 spiral galaxy NGC 6870. The third galaxy is NGC 6861, an elliptical that glows at magnitude 11.1 and lies 25' west of NGC 6868.

You'll find this trio 4.8° west-southwest of magnitude 3.1 Alpha (α) Indi.

OBJECT #618	NGC 6871
Constellation	Cygnus
Right ascension	20h06m
Declination	35°47'

(continued)	
Magnitude	5.2
Size	30'
Type	Open cluster

Our next object lies 2° east-northeast of magnitude 3.9 Eta (η) Cygni. This cluster contains perhaps 15 stars, but lies in front of an extremely rich background, so smaller telescopes work best. The magnitude 5.4 on the north end of the cluster isn't part of the group. Instead, look for several nice double stars within the confines of NGC 6871.

OBJECT #619	NGC 6885
Constellation	Vulpecula
Right ascension	20h12m
Declination	26°28'
Magnitude	8.1
Size	20'
Type	Open cluster
Other names	The 20 Vulpeculae Cluster, Caldwell 37

Our next target surrounds the magnitude 5.9 star 20 Vulpeculae, but, as you may have inferred from the cluster's brightness, doesn't include that luminary. At 100× through a 6-inch telescope, you'll count three dozen stars (not including 20 Vul). A 12-inch scope will net you 75 stars. NGC 6885 is loose and has a roughly triangular shape, best seen at low power. You'll find it 7.6° north-northeast of magnitude 3.5 Gamma (γ) Sagittae, the star that marks the tip of the arrow.

OBJECT #620	NGC 6876
Constellation	Pavo
Right ascension	20h18m
Declination	-70°52'
Magnitude	10.8
Size	3.7' by 3.4'
Type	Elliptical galaxy

Our next target lies 2.5° northeast of the magnitude 4.0 Epsilon (ϵ) Pavonis. This massive, but featureless, elliptical lies at the center of a rich galaxy cluster. A 10-inch telescope brings several fainter companions into view.

Magnitude 12.2 elliptical galaxy NGC 6877 lies 1.5' to the east-northeast. The spiral NGC 6880, which glows at magnitude 12.3, sits 6' to the east of NGC 6876. Finally, move 9' northwest from our starting galaxy to find magnitude 11.7 NGC 6872, a barred spiral galaxy with thin arms. You'll need a 20-inch scope to pull details out of this object.

OBJECT #621	Melotte 227
Constellation	Octans
Right ascension	20h12m
Declination	-79°18'
Magnitude	5.3
Size	50'
Type	Open cluster

For those of you who live in, or travel to, the Southern Hemisphere, here's an object that's not too far from the South Celestial Pole. And, although its discoverer, Belgian-born British astronomer Philibert Jacques Melotte, classified it as an open cluster in 1915, we now know this object is only a random alignment of stars.

Use your lowest power eyepiece, and look for 15 stars brighter than magnitude 10. To find Melotte 227, look 4.8° southwest of magnitude 3.7 Nu (ν) Octantis.

OBJECT #622	NGC 6882
Constellation	Vulpecula
Right ascension	20h12m
Declination	$26^\circ 33'$
Magnitude	8.1
Size	20'
Type	Open cluster

Our next target combines two open cluster designations, NGC 6882 and NGC 6885. Are they the same? Probably.

Through a 4-inch telescope, you'll first see the magnitude 5.9 star 20 Vulpeculae surrounded by 20 cluster members. An 8-inch scope at $200\times$ doesn't add more cluster stars, but it brings out a nice set of fainter background stars.

To find this object, move almost 10° east-northeast from magnitude 4.4 Alpha (α) Vulpeculae.

OBJECT #623	NGC 6886
Constellation	Sagitta
Right ascension	20h13m
Declination	$19^\circ 59'$
Magnitude	11.4
Size	4''
Type	Planetary nebula

You'll find our next object 1.8° east of magnitude 5.1 Eta (η) Sagittae. To view this tiny planetary as anything more than a "star," you'll need a magnification above $300\times$. Don't expect much, however. All you'll notice is a circular disk with a bright center.



Object #624 The Crescent Nebula (NGC 6888) Adam Block/NOAO/AURA/NSF

OBJECT #624	NGC 6888
Constellation	Cygnus
Right ascension	20h13m
Declination	38°21'
Size	18' by 13'
Type	Emission nebula
Other names	The Crescent Nebula, Caldwell 27

Our next object is a bubble of gas carved out of the interstellar medium by an incredibly energetic star known as a Wolf-Rayet star, after the two astronomers who first identified the type. You'll see the W-R star easily. It shines at 7th magnitude and lies at NGC 6888's center.

Although you can detect the Crescent Nebula through small telescopes, 8-inch and larger instruments begin to show some of the structure. The slightly curved northwest edge is the brightest, but a short line of bright nebulosity also lies at the southwest edge. Larger telescopes also will show a thick nebulous patch that runs from the westernmost edge to the central star.

An Oxygen-III filter really helps to bring out the contrasting sections of this object. Such a filter also increases its overall visibility by dimming the vast number of background stars.

To find the Crescent Nebula, look 1.2° west-northwest of the magnitude 4.8 star 34 Cygni.

OBJECT #625	31 Cygni
Constellation	Cygnus
Right ascension	20h14m
Declination	46°44'
Magnitudes	3.8/6.7/4.8
Separations	107"/337"
Type	Double star

To find 31 Cyg, look 5° west-northwest of 1st-magnitude Deneb (Alpha [α] Cygni). Sometimes called a triple-star system, but the third star — 30 Cygni — isn't associated with the pair. The brighter star shines yellow, while both the secondary and 30 Cyg are blue. This is a wide system, so use low power to view it.

OBJECT #626	NGC 6891
Constellation	Delphinus
Right ascension	20h15m
Declination	12°42'
Magnitude	10.5
Size	14'
Type	Planetary nebula

Our next target lies 4.6° west-northwest of magnitude 4.0 Epsilon (ϵ) Delphini. Through even a 4-inch telescope, you'll see a bright, circular disk with a sharp edge that's distinctly blue. Step up to a 14-inch scope, and use a magnification of $500\times$ to see the inner region as lens-shaped.



Object #627 NGC 6894 Adam Block/NOAO/AURA/NSF

OBJECT #627	NGC 6894
Constellation	Cygnus
Right ascension	20h16m
Declination	30°34'
Magnitude	12.3
Size	42''
Type	Planetary nebula

Our next object is faint, but well worth your time to search out. If your telescope doesn't have a go-to drive, draw a line between 39 Cygni (magnitude 4.4) and 21 Cygni (magnitude 5.2). NGC 6894 lies just slightly to the west of the midway point between the two stars.

Through a medium-size telescope, you'll see a faint, round disk. Step up the size of your instrument, and details start to appear. Through a 12-inch scope, look for a slightly darker central region that spans about half of NGC 6894's diameter. Now you're beginning to see this planetary nebula's ring structure. A 20-inch instrument will show a faint star that sits northwest of the object's center.

OBJECT #628	Alpha (α) Capricorni
Constellation	Capricornus
Right ascension	20h18m
Declination	-12°33'
Magnitudes	3.6/4.2
Separation	378''
Type	Double star
Other name	Algedi

Our next target is an easy-to-find wide binary. You won't even need optical aid to split it, but binoculars help bring out the colors. The slightly brighter primary shines yellow, and the secondary is orange.

The Arabians gave this star its common name — actually, two of them. They called it Prima Giedi and Secunda Giedi. *Giedi* comes from the Arabian name of Capricornus, *Al Jady*, which means the goat (or ibex).

OBJECT #629	Beta (β) Capricorni
Constellation	Capricornus
Right ascension	20h21m
Declination	-14°47'
Magnitudes	3.4/6.2
Separation	206''
Type	Double star
Other name	Dabih

Our next target sits 2.3° south-southeast of our last one, Alpha (α) Capricorni. Beta Cap also is a wide double star. Both components are yellow, but the primary outshines the secondary by some 13 times.

According to Richard Hinckley Allen, *Dabih* comes from the Arabian *Al Sa'd al Dhabih*, the Lucky One of the Slaughterers. This name refers to the sacrifice celebrated by the Arabians when Capricornus first became visible in the eastern morning sky just before sunrise.

OBJECT #630	NGC 6905
Constellation	Delphinus
Right ascension	20h22m
Declination	20°07'
Magnitude	11.1
Size	39''
Type	Planetary nebula
Other name	The Blue Flash

You'll find this superb target 5.8° northwest of magnitude 3.8 Sualocin (Alpha [α] Delphini). Through an 8-inch telescope at 200 \times , you'll see a slightly oval shape with even illumination. A magnitude 10.3 star sits just off NGC 6905's northern tip, and a magnitude 11.4 star lies 1' to the east.

Through a 16-inch scope at 300 \times or more, you'll barely see the central star. Look for two small regions that trail off from the north and south edges. The one to the south is easier to see.

The Blue Flash Planetary got its name when amateur astronomers using telescopes having less than 8' of aperture saw a faint blue object pop in and out of view.

OBJECT #631	NGC 6907
Constellation	Capricornus
Right ascension	20h25m
Declination	-24°49'

(continued)	
Magnitude	11.1
Size	3.2' by 2.3'
Type	Barred spiral galaxy

Call me strange. My nickname for this object is the “Giant Behemoth Galaxy.” I think NGC 6907 looks like the prehistoric monster that terrorized England in the 1959 movie of the same name. The galaxy’s central region is the behemoth’s body, and the one thick spiral arm is its long neck and head, curving backward to strike terror in the masses.

You’ll find NGC 6907 4.8° due west of magnitude 4.1 Psi (ψ) Capricorni. The galaxy’s bright bar orients east-west, and the one visible arm curves northward from its east end.

OBJECT #632	NGC 6910
Constellation	Cygnus
Right ascension	20h23m
Declination	$40^\circ 47'$
Magnitude	7.4
Size	10'
Type	Open cluster

You’ll easily find this bright cluster 0.5° north-northeast of magnitude 2.2 Sadr (Gamma [γ] Cygni). A 4-inch telescope will reveal two dozen stars, and larger scopes will allow you to see as many as 50 stars. The brightest star here is magnitude 7.0 SAO 49563, which sits at the cluster’s eastern edge. A 12-inch or larger scope equipped with a nebula filter will dim the stars in this region and reveal a large complex of nebulosity.

OBJECT #633	M29 (NGC 6913)
Constellation	Cygnus
Right ascension	20h24m
Declination	$38^\circ 32'$
Magnitude	6.6
Size	6'
Type	Open cluster
Other name	The Cooling Tower

Although M29 is a Messier object, it’s one of the most difficult to identify. The reason is that M29 is a loose open cluster of about two dozen stars lying in front of a rich Milky Way star field.

To find M29, look 1.8° south of magnitude 2.2 Sadr (Gamma [γ] Cygni). A small telescope works best on this cluster because it won’t reveal the multitude of surrounding stars. To prove this to myself, I once made a cardboard insert for the front of a 12-inch telescope. The insert had a 3-inch diameter hole drilled in it. I viewed M29 (and many other objects) with and without the insert, and the cluster was, indeed, easier to pick out when the insert was in place.

British amateur astronomer Jeff Bondono gave M29 its common name. He thought two curving lines of its stars looked like the concave sides of a cooling tower in operation at a nuclear power plant.

OBJECT #634	IC 5013
Constellation	Microscopium
Right ascension	20h29m
Declination	$-36^\circ 02'$
Magnitude	11.7
Size	1.8' by 0.6'
Type	Barred spiral galaxy

IC 5013 combines with IC 5011 for our next treat. IC 5013 is the brighter and bigger of the two, and is a fat, lens-shaped spiral. IC 5011, which glows feebly at magnitude 14.0, is an elliptical galaxy measuring only 0.7' long. It's round, and it appears attached to IC 5013's southwest edge.

You'll find this pair 4.9° west-southwest of magnitude 4.9 Alpha (α) Microscopii.

OBJECT #635	Omicron (θ) Capricorni
Constellation	Capricornus
Right ascension	20h30m
Declination	-18°35'
Magnitudes	5.9/6.7
Separation	22''
Type	Double star

Look for Omicron Cap 4.4° south-southeast of magnitude 3.1 Dabih (Beta [β] Capricorni). It's the southernmost and easternmost of a small stellar triangle. The other two stars are Pi (π) and Rho (ρ) Capricorni. Most observers see both components of this system as bluish-white.