November

Object #823 The Silver Sliver Galaxy (NGC 891) Adam Block/NOAO/AURA/NSF

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OBJECT #823	NGC 891
Constellation	Andromeda
Right ascension	2h22.6m
Declination	42°21′
Magnitude	9.9
Size	13.0′ by 2.8′
Type	Spiral galaxy
Other names	The Silver Sliver Galaxy, Caldwell 23

You know, second place is fine if people remember you. NGC 891's problem is that it's Andromeda's second-best galaxy. Not bad, except the constellation's top dog happens to be one of the sky's supreme wonders — the Andromeda Galaxy (M31).

Despite that, NGC 891 ranks as one of the sky's best edge-on galaxies. It inclines only 1.4° to our line of sight. Its more than four-to-one length to width ratio and 10th-magnitude brightness easily earned it the nickname the "Silver Sliver."

A 10-inch telescope reveals a symmetrical object about 10′ long with a noticeable but narrow central bulge. A dark dust lane bisects the galaxy and runs nearly its entire length. Dozens of foreground stars populate the field, adding a third dimension to the view.

At magnifications above 200×, note the sections of NGC 891's nucleus on each side of the dust lane. The western section glows slightly brighter. Likewise, the galaxy's disk to the southwest outshines its lesser half, which lies to the northeast.

Object #824 NGC 896 Sean and Renee Stecker/Adam Block/NOAO/AURA/NSF

OBJECT #824	NGC 896
Constellation	Cassiopeia
Right ascension	2h25m
Declination	61°54′
Size	20′ by 20′
Type	Emission nebula

To find this emission nebula, move 3.9° east-southeast from magnitude Epsilon (ε) Cassiopeiae. An 8-inch telescope and a nebula filter will reveal only the bright condensation on NGC 896's western edge. Just 8′ to the east-northeast lies the more impressive nebula IC 1795.

Object #825 NGC 908 George and Laura Mishler/Adam Block/NOAO/AURA/NSF

OBJECT #825	NGC 908
Constellation	Cetus
Right ascension	2h23m
Declination	–21°14′
Magnitude	10.4
Size	5.9′ by 2.3′
Type	Spiral galaxy

To find spiral galaxy NGC 908, look 5.4° east of magnitude 4.0 Upsilon (υ) Ceti. Through an 8-inch telescope, it appears as an oval haze stretched roughly east-west. The core is quite a bit brighter, and ghostly hints of spiral structure appear at high magnifications.

Through a 16-inch scope, an arm that radiates to the north of the core and turns abruptly to the west is quite prominent. A fainter arm that can be seen with more difficulty extends due east and ends near a 15th-magnitude star. The core also appears irregular.

OBJECT #826	NGC 925
Constellation	Triangulum
Right ascension	2h27.3m
Declination	33°35′
Magnitude	10.1
Size	12.0′ by 7.4′
Type	Spiral galaxy

NGC 925 is an attractive, nearly face-on spiral galaxy in the small constellation Triangulum. What makes NGC 925 special among spirals is the bar that projects from its core.

To find NGC 925, point your telescope 2° east of the magnitude 4 star Gamma (γ) Trianguli. Through a small scope, this galaxy's figure appears indistinct, but an 8-inch or larger instrument reveals the spiral arms that fold back abruptly from a long bar. At high magnification, say, above 250×, you'll spot NGC 925's stellar nucleus.

OBJECT #827	NGC 936
Constellation	Cetus
Right ascension	2h28m
Declination	–1°09′
Magnitude	10.2
Size	4.7′ by 4.1′
Type	Barred spiral galaxy

This relatively bright galaxy looks a bit oval through small telescopes, but use a 12-inch or larger instrument, and you'll instantly spot the central bar, which stretches east to west. NGC 936 lies 1.1° west from the magnitude 5.4 star 75 Ceti.

OBJECT #828	Alpha Ursae Minoris
Constellation	Ursa Minor
Right ascension	2h32m
Declination	89°16′
Magnitudes	2.0/9.0
Separation	18.3″
Type	Double star
Other name	Polaris

William Herschel discovered that Polaris was a binary star in 1780. Although the yellow primary outshines the blue secondary by more than 650 times, a 3-inch telescope at 100× easily will show you Polaris B.

OBJECT #829	NGC 956
Constellation	Andromeda
Right ascension	2h32m
Declination	44°36′
Magnitude	8.9
Size	6′
Type	Open cluster

You'll find our next treat 5.7° east-northeast of magnitude 2.2 Almach (Gamma [γ] Andromedae). This odd cluster has two 9th-magnitude stars at its north and south end, a couple more 10th-magnitude stars, and about a dozen magnitude 12 and fainter stars strewn about.

Object #830 NGC 957 Anthony Ayiomamitis

OBJECT #830	NGC 957
Constellation	Perseus
Right ascension	2h33m
Declination	57°34′
Magnitude	7.6
Size	10′
Type	Open cluster

You'll find our next target about 1.5° east-northeast of the Double Cluster (Object #821). Through an 8-inch scope at 100×, you'll count two dozen stars. The magnitude 8.0 star HIP 11898 sits slightly southeast of the cluster's center. At the cluster's southwest edge sits magnitude 8.5 SAO 23415.

OBJECT #831	IC 1805
Constellation	Cassiopeia
Right ascension	2h33m
Declination	61°27′
Magnitude	6.5
Size	60′
Type	Emission nebula
Other names	The Heart Nebula

Some nebulae glow because a hot star within them emits enough energy to excite hydrogen atoms. The atoms can't hold the extra energy long, however, and they reemit it as light with a red color.

The Heart Nebula, in contrast, glows because it contains an entire cluster of stars that formed within it. The combined radiation from cluster stars makes such nebulae bigger, brighter, or both. You'll find this object 4.9° east-southeast of magnitude 3.4 Epsilon (ε) Cassiopeiae.

Several of the stars in IC 1805's central cluster are 50 times more massive than the Sun. In addition to powering the nebula's glow, these stars' stellar winds propel hydrogen into space, where gaseous rings overlap other rings. This gives the "heart" its shape.

Because of its size, you can approach observing the Heart Nebula in two ways, with low or high magnification. Each requires at least an 8-inch telescope and a dark sky.

For an overall view, use an eyepiece that provides a 1° field of view. Insert a nebula filter, and identify the heart's brightest regions: the central cluster, the knot of nebulosity to the east, and the crescent of gas to the southwest.

The magnitude 6.7 star cluster NGC 1027 shines 1.2° east of the nebula. This cluster spans 15′. Another bright, condensed nebulous knot, NGC 896, lies 1° southwest of the Heart Nebula. Many observers see this 20′-wide object before they spot IC 1805.

OBJECT #832	NGC 972
Constellation	Aries
Right ascension	2h34m
Declination	29°19′
Magnitude	11.4
Size	3.4′ by 1.6′
Type	Spiral galaxy

Through an 8-inch telescope, this galaxy looks like a bright, small oval surrounded by an outer halo, which quickly fades to the black of space. To find NGC 972, head 1.4° east-southeast of the magnitude 5.3 star 12 Trianguli.

OBJECT #833	Fornax Dwarf
Constellation	Fornax
Right ascension	2h40m
Declination	–34°32′
Magnitude	8.1
Size	12.0′ by 10.2′
Type	Dwarf elliptical galaxy

American astronomer Harlow Shapley (1885–1972) discovered the Fornax Dwarf in 1938. At a distance of 438,000 light-years, it is the Milky Way's closest dwarf companion.

Although the Fornax Dwarf's stated magnitude indicates a bright object, its size is such that it covers 17% the area of the Full Moon. The Dwarf's surface brightness, therefore, is low.

I've spotted this object through a 4-inch refractor equipped with a wide-angle eyepiece. Through an 8-inch scope, use an eyepiece that yields a 1° field of view, and slowly sweep the field of view. What you're looking for is a faint haze just brighter than the background sky.

Once you've located the Fornax Dwarf, crank up the magnification and aim for its northern edge. There sits globular cluster NGC 1049. This object shines at magnitude 12.6 and measures roughly 1.2′ across.

OBJECT #834	NGC 986
Constellation	Fornax
Right ascension	2h34m
Declination	–39°03′
Magnitude	10.8
Size	4′ by 3.2′
Type	Spiral galaxy

Here's a nice treat that lies in southern Fornax right next to that constellation's border with Eridanus. To find NGC 986, first locate magnitude 4.1 Iota (*ι*) Eridani. Then move 1.6° west-northwest. Small telescopes will show an oval shape elongated northeast to southwest. Through 12-inch and larger scopes, however, you'll spot the two broad but incredibly short spiral arms, one on the north end and the other angling south.

OBJECT #835	NGC 1023
Constellation	Perseus
Right ascension	2h40m
Declination	39°04′
Magnitude	9.3
Size	8.6′ by 4.2′
Type	Spiral galaxy
Other name	The Perseus Lenticular

The bright lenticular galaxy NGC 1023 measures three times as long as it is wide, stretching in a rough east-west direction. Through small telescopes, the core appears small, almost starlike. Use a 14-inch or larger scope, however, and you'll see that the central region spans half of this galaxy's overall length.

For a bit of a challenge, try to spot the magnitude 13.8 irregular galaxy NGC 1023A, which appears embedded in the eastern end of NGC 1023's halo.

Object #836 NGC 1027 Anthony Ayiomamitis

OBJECT #836	NGC 1027
Constellation	Cassiopeia
Right ascension	2h43m
Declination	61°36′
Magnitude	6.7
Size	15′
Type	Open cluster

You'll find this nice cluster not quite 6° east-southeast of magnitude 3.4 Epsilon (ε) Cassiopeiae. Through an 8-inch telescope at 100×, you'll see the brightest 15 or so members hung in front of a haze of fainter stars. A 12-inch telescope resolves about 20 more stars. The bright star at the heart of NGC 1027 is magnitude 7.0 SAO 12402.

Object #837 M34 Anthony Ayiomamitis

OBJECT #837	M34 (NGC 1039)
Constellation	Perseus
Right ascension	2h42m
Declination	42°47′
Magnitude	5.2
Size	35′
Type	Open cluster
Other name	The Spiral Cluster

Our next object is a nice small telescope target: open cluster M34 in Perseus. Although this is one of Messier's objects — and a bright one at that — it often gets overlooked by amateur astronomers.

From a dark site you'll find M34 with your naked eyes roughly 5° west-northwest of Algol (Beta [β] Persei). This magnitude 5.2 cluster contains 10 stars brighter than 9th magnitude spread out over an area 35′ across. That's a bit bigger than the Full Moon.

A 4-inch scope reveals three dozen member stars between 8th and 12th magnitude. The way they loop across the cluster's face led British amateur astronomer Jeff Bondono to give M34 its common name. At medium magnification (say, 100×), look for chains of faint stars crisscrossing the field of view.

OBJECT #838	NGC 1052
Constellation	Cetus
Right ascension	2h41m
Declination	–8°15′
Magnitude	10.5
Size	2.5′ by 2.0′
Type	Spiral galaxy

At the eastern edge of Cetus, 3.8° west of magnitude 3.9 Azha (Eta [η] Eridani) lies a nice trio of galaxies highlighted by NGC 1052. Through an 8-inch telescope, NGC 1052 appears bright and oval with an extended central region surrounded by a slight haze.

Only 15′ to the southwest lies the magnitude 11.0 spiral NGC 1042. It's more than 50% bigger than NGC 1052, but you'll need at least a 16-inch scope to bring out any trace of spiral structure.

Even fainter is magnitude 12.2 NGC 1035, 23′ northeast of NGC 1042. This galaxy is three times as long as it is wide, but doesn't show details through most scopes. Some amateurs like to use a magnification of about 100× to catch all three galaxies at once.

OBJECT #839	NGC 1055
Constellation	Cetus
Right ascension	2h42m
Declination	0°26′
Magnitude	10.6
Size	7.3′ by 3.3′
Type	Spiral galaxy

Look 39′ east of magnitude 4.1 Delta (δ) Ceti, and you'll find NGC 1055. This galaxy's overall shape looks a lot like the Whale Galaxy (Object #293) to me. Through a 6-inch telescope, the galaxy appears three times as long as wide and aligned nearly east-west. Just to the north of the galaxy you'll find the magnitude 11.2 star GSC 47:1504.

Object #840 Cetus A (M77) Francois and Shelley Pelletier/Adam Block/NOAO/AURA/NSF

OBJECT #840	M77 (NGC 1068)
Constellation	Cetus
Right ascension	2h43m
Declination	–0°01′

(continued)	
Magnitude	8.9
Size	8.2′ by 7.3′
Type	Spiral galaxy
Other name	Cetus A

One of the sky's most active galaxies sits in the huge but hard to recognize constellation Cetus the Whale. And it's doubly unfortunate for observers, because much of this galaxy's drama occurs outside the wavelengths of visible light. That fact led observers to begin to call this galaxy by its radio designation as the first strong radio source in the constellation — Cetus A.

Pierre Méchain discovered M77 in 1780. Messier included it in his catalog December 17.

Astronomers classify M77 as a Seyfert galaxy. American astronomer Carl K. Seyfert (1911–1960) pioneered research on nuclear emissions in spiral galaxies. He described galaxies with bright nuclei that emit light with emission-line spectra and exhibit broadened emission lines. These features indicated the galaxies' cores were expelling giant gas clouds at high speeds.

Visually, the galaxy's central area, one-third its total width, commands observers' attention. Although you can spot M77 through any telescope, a 10-inch or larger instrument and a magnification above 300× will reveal the most detail.

Try to ignore the bright core, and search the disk surrounding it for signs of mottled structure. Through even larger scopes, look for the tightly wound spiral arms — the brightest one lies southeast of the core.

OBJECT #841	Gamma (γ) Ceti
Constellation	Cetus
Right ascension	2h43m
Declination	3°14′
Magnitudes	3.5/7.3
Separation	2.8″
Type	Double star
Other name	Kaffaljidhmah

This colorful double is a bit puzzling. The primary appears white or "just a bit" yellow. There's not much dispute about that. The fainter companion, however, should not appear the color observers report. The secondary is a spectral class F star, which is a bit hotter, and therefore should be just a bit whiter than our Sun. Still, most observers see it as some shade of blue.

According to Richard Hinckley Allen, the common name of this star comes from the Arabic Al Kaff al Jidhmah, which represents the whole group that marks the Whale's head.

OBJECT #842	NGC 1073
Constellation	Cetus
Right ascension	2h44m
Declination	1°23′
Magnitude	11.0
Size	5.0′ by 5.0′
Type	Spiral galaxy

Our next target lies 1.5° northeast of magnitude 4.1 Delta (δ) Ceti. Telescopes below 10 inches in aperture won't show a lot of details except the bar. Through a 16-inch telescope, the faint spiral arms also pop into view, but the northern arm is definitely brighter than the southern one.

OBJECT #843	Musca Borealis the Northern Fly
Constellation	Aries
Right ascension	2h46m
Declination	27°36′
Type	Extinct constellation
Other name	Apes

Indulge me on this object. I'm something of a constellation historian, so I thought it would be fun if one of our objects no longer existed in its original form. So, this naked-eye object is the extinct constellation Musca Borealis the Northern Fly. Dutch mapmaker Petrus Plancius (1552–1622) introduced this constellation around 1614 under the name Apes. He formed it from four stars — 33, 35, 39, and 41 Arietis — in the present-day constellation Aries the Ram.

To find these stars, look about 9° east-northeast of Aries' brightest star Hamal (Alpha [α] Arietis). And although I do rate this as a naked-eye object from a dark site, be forewarned: The brightest of these stars, 41 Arietis, shines at only magnitude 3.6, and the faintest, 39 Ari, glows at magnitude 5.3. If you have any trouble seeing the group, use binoculars. The Northern Fly spans only 2.5°.

OBJECT #844	NGC 1084
Constellation	Eridanus
Right ascension	2h46m
Declination	–7°35′
Magnitude	10.7
Size	2.8 by 1.4
Type	Spiral galaxy

This relatively bright spiral lies 2.9° west-northwest of magnitude 3.9 Azha (Eta [η] Eridani). Through a 4-inch telescope, NGC 1084 has a nearly rectangular shape and is twice as long as it is wide. A 12-inch scope reveals not a lot more, but it does show the core is broad — as much as three-quarters the galaxy's length. The edges of this galaxy are irregular, but I saw no hint of spiral structure.

OBJECT #845	NGC 1097
Constellation	Fornax
Right ascension	2h46m
Declination	–30°14′
Magnitude	9.2
Size	10.5′ by 6.3′
Type	Barred spiral galaxy
Other name	Caldwell 67

Our next object is a bright barred spiral that sits 2° north of magnitude 4.5 Beta (β) Fornacis. Through an 8-inch telescope, you'll see NGC 1097's core as a bright disk surrounded by an oval haze. Within that oval is the galaxy's faint bar. You won't see much of the faint, thin spiral arms no matter what scope you observe through. Through a 30-inch telescope, I saw what appeared to be the beginning of the northern spiral arm.

Just to the northeast of NGC 1097 sits NGC 1097A. This tiny peculiar elliptical galaxy glows at magnitude 13.2. Some evidence exists for the two galaxies' past interaction.

OBJECT #846	IC 1848
Constellation	Cassiopeia
Right ascension	2h51m
Declination	60°26′
Magnitude	6.5

(continued)	
Size	60′
Type	Emission nebula
Common names	The Baby Nebula, the Soul Nebula

Surroundings mean a lot. Take IC 1848, for example. When viewed or imaged alone, amateur astronomers call it the Baby Nebula because of its shape. Combine it with the Heart Nebula (IC 1805), however, and, collectively, the pair becomes the Heart and Soul Nebula.

The Baby Nebula sits 2.5° east-southeast of the Heart Nebula. Although equally as wide (1°) as IC 1805, the Baby Nebula doesn't cover as much area, so it appears more concentrated.

A nebula-filtered view shows two large regions that form the "baby's" head and body. The head appears denser, while the body surrounds a small star cluster within. To see the stars better, remove the nebula filter. Through a 12-inch or larger telescope, you'll notice brightness differences along the body's edge. Look for two crescent-shaped nebulae, a smaller one to the northeast and a larger one to the west.

OBJECT #847	Struve 331
Constellation	Perseus
Right ascension	3h01m
Declination	52°21′
Magnitudes	5.3/6.7
Separation	12.1″
Type	Double star

This nice pair lies near the Pleiades (M45), but the easiest way to find it is to start at magnitude 3.9 Tau (τ) Persei, and head 1.5° northwest. The separation allows splits through even small telescopes. The primary shines lemon yellow, and the secondary is pale blue.

OBJECT #848	Beta Persei
Constellation	Perseus
Right ascension	3h08m
Declination	40°57′
Magnitude range	2.1–3.4
Period	2.867 days
Type	Variable star
Other name	Algol

Algol normally shines at a bright magnitude 2.1. Every 2 days, 20 hours, and 49 minutes, however, it dims to magnitude 3.4. So, at maximum, Algol is 3.3 times as bright as when it's at its minimum. This dip in brightness occurs when a faint, unseen star orbiting Algol passes in front of it and blocks some of its light. Each eclipse lasts approximately 10 hours.

The first eclipsing binary star to be discovered (by Italian astronomer Geminiano Montanari in 1667), Algol remains the easiest to observe. Most of the time it appears nearly as bright as magnitude 1.8 Mirfak (Alpha [α] Persei), but keep an eye on it and you may catch it when it's fainter than magnitude 3.0 Delta (δ) Persei.

The name Algol comes from the Arabic "Ra's al Ghul," the demon's head. Although some historians have tried to link this name with Algol's changeable brightness, that is incorrect. The name dates from the time of Ptolemy, many centuries before anyone discovered the variability of any star.

OBJECT #849	NGC 1201
Constellation	Fornax
Right ascension	3h04m
Declination	−26°04′

(continued)	
Magnitude	10.7
Size	3.6′ by 2.1′
Type	Elliptical galaxy

Our next target lies 1.3° southeast of magnitude 5.7 Zeta (ζ) Fornacis. This fat, lens-shaped galaxy orients north-south. The extended central region appears featureless, and a thin haze surrounds it.

You'll also note the magnitude 10.7 star GSC 6441:848 lies not quite 4′ to the northeast. This star's magnitude is the same as the galaxy's so compare them to see how point-source magnitudes compare to those of extended sources.

OBJECT #850	NGC 1232
Constellation	Eridanus
Right ascension	3h10m
Declination	–20°35′
Magnitude	10.0
Size	6.8′ by 5.6′
Type	Spiral galaxy

Although even a 4-inch telescope will reveal NGC 1232, you'll see this classic face-on spiral best through instruments with 12′ of aperture or more. Seeing — the steadiness of the air above your observing site — is the key to discerning the individual spiral arms. Can you see three? Four? Six (or parts thereof)? It all depends on how clear your view is.

Through a large scope, this galaxy's nucleus has a slight east-west elongation. This characteristic puts NGC 1232 in the barred spiral category.

OBJECT #851	NGC 1245
Constellation	Perseus
Right ascension	3h15m
Declination	47°15′
Magnitude	8.4
Size	10′
Type	Open cluster

To find NGC 1245, draw a line between magnitude 4.1 Iota (ι) Persei and magnitude 3.8 Kappa (κ) Persei. The cluster lies less than 1° east of the line's center point. Through an 8-inch telescope, you'll see more than 50 stars evenly distributed across its face. The magnitude 8.0 star SAO 38671 gleams at the cluster's southern edge.

OBJECT #852	NGC 1252
Constellation	Horologium
Right ascension	3h11m
Declination	–57°46′
Size	6′
Type	Asterism
Notes	Grouping of 18–20 stars

In the far-southern constellation Horologium, you'll find an interesting group of stars 2.5° north-northeast of magnitude 5.1 Mu (μ) Horologii. Eight stars ranging from magnitude 6.0 to magnitude 9.5 form a loose Greek letter Lambda (λ).

But look more closely at magnitude 6.0 GSC 8498:1319, the brightest and most southerly of the Lambda. Some astronomers think the fainter stars near it form an open cluster 2,000 light-years away.

However, proper motion data collected by the Hipparcos satellite indicate that the stars are unassociated. A 4-inch telescope reveals a group of 11th- to 14th-magnitude stars in an area 6′ across.

Object #853 NGC 1255 Peter and Suzie Erickson/Adam Block/NOAO/AURA/NSF

OBJECT #853	NGC 1255
Constellation	Fornax
Right ascension	3h14m
Declination	–25°43
Magnitude	10.7
Size	4.2′ by 2.7′
Type	Spiral galaxy

Our next target lies 3.3° north of magnitude 3.9 Alpha (α) Fornacis. Through an 8-inch telescope, you'll see NGC 1255 as an oval with irregular borders. Move up to a 16-inch, and crank the magnification past 350×, and a weak spiral pattern appears. This galaxy's arms curve tightly inward around its core, so they don't display a classic spiral pattern.

OBJECT #854	NGC 1261
Constellation	Horologium
Right ascension	3h12m
Declination	–55°13′
Magnitude	8.3
Size	6.9′
Type	Globular cluster
Other name	Caldwell 87

This fine globular lies 4.7° north-northeast of magnitude 5.1 Mu (μ) Horologii. You'll first spot this object through a finder scope or even binoculars, and any size telescope shows it well. That said, its

halo stars resolve well through a 10-inch or larger scope. You'll also notice the extremely concentrated core. No telescope will allow you to resolve the stars there. The magnitude 9.1 star GSC 8495:1472 lies 3′ northeast of the cluster's center.

Object #855 Perseus A (NGC 1275) Jeff Cremer/Adam Block/NOAO/AURA/NSF

OBJECT #855	NGC 1275
Constellation	Perseus
Right ascension	3h20m
Declination	41°31′
Magnitude	11.9
Size	3.2′ by 2.3′
Type	Spiral galaxy
Other names	Perseus A, Caldwell 24

NGC 1275 is the brightest member of the Perseus Galaxy Cluster. This group is part of the Pisces-Perseus Supercluster, which contains about 1,000 galaxies. The Perseus Galaxy Cluster also goes by the name Abell 426.

That name comes from American astronomer George Abell, who identified and cataloged 2,712 galaxy clusters in 1958. With the inclusion of southern-sky galaxy clusters since then, the catalog has grown to 4,073 galaxy clusters.

To find NGC 1275, look 2° east of Algol (Beta [β] Persei). Through a telescope, this galaxy appears bright, small, and nearly circular. Don't confuse it with NGC 1272, a similar galaxy just 5′ to the west. NGC 1275 is slightly brighter, at magnitude 11.7. NGC 1272 shines at magnitude 12.

Through a 10-inch telescope, you'll spot a dozen galaxies in a field of view 1° across. Most lie south and west of NGC 1275. Here's a region of sky where increased telescope aperture really pays off. As you look through larger telescopes, you'll see more galaxies, and the ones you've seen already will show more detail.

OBJECT #856	Stock 23
Constellation	Camelopardalis
Right ascension	3h16m
Declination	60°02′
Magnitude	6.5
Size	14′
Type	Open cluster
Other name	Pazmino's Cluster

This small telescope target lies in the southwestern part of Camelopardalis. It's Pazmino's Cluster, also known as Stock 23. To find it, scan 5.3° northeast of magnitude 3.8 Eta (η) Persei. The cluster shines at a respectable magnitude 6.5.

Through your finder scope, Stock 23 is an unresolved clump of stars. View it through a 3-inch telescope at a magnification of 50×, however, and you'll spot two dozen stars spread across an area 15′ wide.

Four cluster stars shine brighter than 8th magnitude, including double star ADS 2426, which lies at the center. It's a close double star with a separation of only 7″. If you can't split it at 50×, just double the power, and you'll have no problem.

Observers began calling this cluster Pazmino's Cluster after American amateur astronomer John Pazmino spotted it in 1977. German astronomer Jürgen Stock had cataloged it in the 1950s.

OBJECT #857	NGC 1291
Constellation	Eridanus
Right ascension	3h17m
Declination	–41°08′
Magnitude	8.5
Size	11.0′ by 9.5′
Type	Spiral galaxy
Other name	The Snow Collar Galaxy

You'll find this bright galaxy 3.7° east of magnitude 3.5 Theta (θ) Eridani. It appears slightly oblong, but, apart from a faint outer halo, you'll see no details here through even a medium-sized telescope. With larger apertures, you may see the two faint, broad arcs of light that *Astronomy* magazine Contributing Editor Stephen James O'Meara says look like snowflakes that have fallen on a fur collar.

Note: NGC 1291 is the same galaxy you'll sometimes see labeled as NGC 1269. This is a catalog number error.

OBJECT #858	NGC 1300
Constellation	Eridanus
Right ascension	3h20m
Declination	–19°25′
Magnitude	10.4
Size	5.5′ by 2.9′
Type	Spiral galaxy

NGC 1300 has a simple shape — that of a squashed letter S — but I bet you'll find yourself returning to view this celestial wonder more than once. Better yet, show it to your friends. It's a classic barred spiral with two arms, both of which originate from the ends of the bar and move out at right angles to the bar.

To find NGC 1300, look 2.3° due north of magnitude 3.7 Tau^4 (τ^4) Eridani. Crank up the magnification past 200× and look first for the bright oval nucleus. It's twice as long as it is wide. The next features that will become evident are the beginnings of the spiral arms. They're quite clumpy near the nucleus. Finally, if you're viewing through a 16-inch or larger scope, try to trace the thin spiral arms as they tightly curve past the nucleus on the northern and southern sides.

OBJECT #859	NGC 1313
Constellation	Reticulum
Right ascension	3h18m
Declination	–66°30′
Magnitude	8.9
Size	11.0′ by 7.6′
Type	Spiral galaxy

Our next object is one of the southern sky's showpiece galaxies, but you're forgiven if you haven't heard of it. NGC 1313 sits in the southwest corner of Reticulum 3.2° southwest of magnitude 3.8 Beta (β) Reticuli.

Through an 8-inch telescope, the first feature you'll notice is the thick bar that has a slight central bulge that orients north-south. A spiral arm extends eastward from the north end of the bar and westward from the south end. The eastward bar has two distinct sections divided by a dark region. You'll also notice many bright knots along the arms and the bar. Those are star-forming regions — Moreover, a spiral arm divided into two elongated sections extends at a right angle to the east from the north end of the bar. And all this is visible through an 8-inch scope!

If you use a 14-inch or larger scope on this object, look 16′ southeast of NGC 1313 for the magnitude 13.8 edge-on spiral NGC 1313A.

OBJECT #860	NGC 1316
Constellation	Fornax
Right ascension	3h23m
Declination	–37°12′
Magnitude	8.9
Size	11.0′ by 7.6′
Type	Spiral galaxy
Other name	Fornax A

The powerful radio source astronomers call Fornax A is a bright galaxy you can find 1.4° south-southwest of magnitude 6.4 Chi^1 (χ^1) Fornacis. This galaxy's spiral arms wrap so tightly around its core that it appears elliptical through most telescopes. NGC 1316 isn't circular, however. It's about half again as long as it is wide, and it orients northeast to southwest. You'll see the broad central region surrounded by a thick halo.

Slightly more than 6′ north of Fornax A lies NGC 1317, a similar spiral that also has tight spiral arms. This galaxy glows at magnitude 11.9.

OBJECT #861	NGC 1326
Constellation	Fornax
Right ascension	3h24m
Declination	–36°28′
Magnitude	10.5
Size	3.9′ by 2.9′
Type	Spiral galaxy

You'll find our next target 41′ southwest of magnitude 6.4 Chi^1 (χ^1) Fornacis. This galaxy appears as a thick oval oriented northeast to southwest. Its broad central region is all most telescopes will show, but it does have a thin halo that high magnification in a large telescope will reveal.

OBJECT #862	Alpha Persei Association
Constellation	Perseus
Right ascension (approx.)	3h24m
Declination (approx.)	49°52′

(continued)	
Magnitude	1.2
Size (approx.)	185′
Type	Open cluster

One naked-eye object you'll want to identify is the Alpha Persei Association. As the name implies, this brilliant stellar group surrounds the star Mirfak (Alpha [α] Persei). Another name for this famous cluster is Melotte 20.

This large, scattered group of bright stars appears obvious to the naked eye. I point that out because it lies some 600 light-years away in the rich star fields along our galactic plane.

For the best view of Melotte 20, try binoculars or a rich-field telescope. Keep the magnification under 20×. Even at such low power, you'll see 50 bright stars — most prominent magnitude 1.8 Alpha and magnitude 4.3 Psi (Ψ) Persei — mainly to the south and east of Alpha.

All told, more than 100 young stars brighter than magnitude 12 spread across the association's 3° width. The group's total magnitude is an impressive 1.2.

OBJECT #863	NGC 1332
Constellation	Eridanus
Right ascension	3h26m
Declination	–21°20′
Magnitude	10.5
Size	5.0′ by 1.8′
Type	Elliptical galaxy

If you're moving through this guide from beginning to end, then you've already found Tau^4 (τ^4) Eridani. From that magnitude 3.7 star, move 1.6° east-northeast, and you'll land on NGC 1332.

This elongated object appears like a stubby cigar three times as long as it is wide. Through small telescopes the surface brightness remains remarkably constant across NGC 1332's surface. Larger scopes reveal the outer 10% is fainter than the rest, and it fades rapidly with increasing distance from the core.

Object #864 The Embryo Nebula (NGC 1333) Jay Lavine and Ali Huang/Adam Block/NOAO/AURA/NSF

OBJECT #864	NGC 1333
Constellation	Perseus
Right ascension	3h29m
Declination	31°25′
Size	6′ by 3′
Type	Emission and reflection nebulae
Other names	The Embryo Nebula, the Phantom Tiara

You'll find this nebula in southern Perseus, where its border intersects those of Taurus and Aries. Specifically, look 3.3° west-southwest of magnitude 3.8 Omicron (*o*) Persei.

Through an 8-inch telescope, you'll see a bright haze. It appears brightest at the northeastern end, where the magnitude 10.5 star GSC 2342:624 that illuminates the nebula resides. Along with the nebulae, you'll spot several voids.

This object lets observers try a technique I have used on the Trifid Nebula (M20). Because both objects contain emission and reflection nebulae, a nebula filter will dim the reflection component, increasing the contrast of the emission nebulosity. Remove the filter, and your mind will fool you into thinking the reflection nebulosity has gotten brighter.

Astronomy magazine Contributing Editor Stephen James O'Meara gave this deep-sky wonder both of its common names. He noted one magnitude 10.5 star (HIP 16243, which actually lies in Aries, not Perseus) looks like a crown jewel in a phantom diamond tiara. He uses the same star to make the eye of an embryo.

OBJECT #865	NGC 1342
Constellation	Perseus
Right ascension	3h32m
Declination	37°22′
Magnitude	8.9
Size	11.0′ by 7.6′
Type	Open cluster

You'll find our next target 5.7° west-southwest of magnitude 3.0 Epsilon (ε) Persei. Through an 8-inch telescope at 150×, you'll spot 50 stars evenly distributed across the face of this cluster. A 12-inch scope shows lines and arcs of the brighter members and brings 50 more stars into view.

OBJECT #866	NGC 1350
Constellation	Fornax
Right ascension	3h31m
Declination	–31°38′
Magnitude	10.3
Size	6.2′ by 3.2′
Type	Spiral galaxy

Through small to medium-sized telescopes, this galaxy looks like an evenly illuminated white football. Through a 16-inch telescope, you'll spot the long bar and several diaphanous spiral arms that tightly hug the main part of the galaxy. NGC 1350 lies 2.9° southwest of magnitude 5.0 Delta (δ) Fornacis.

OBJECT #867	NGC 1360
Constellation	Fornax
Right ascension	3h33m
Declination	–25°51′

(continued)	
Magnitude	9.4
Size	390″
Type	Planetary nebula

If you expect most planetary nebulae to appear round, you're not alone. NGC 1360, however, is an exception. It appears twice as long as it is wide, extended in a roughly north-south orientation. The northern half glows more brightly than the southern.

Through a 12-inch telescope at a magnification above 200×, both sections have a darker lane crossing them. The northern half's lane enters from the east and is thin. By contrast, the dark region in southern half of NGC 1360 is wide, extending all the way from this object's southern tip to the 11th-magnitude central star. Using an OIII filter will add contrast and help you see the darker and lighter regions better.

To find NGC 1360, look 5.6° northeast of magnitude 4.0 Alpha (α) Fornacis.

OBJECT #868	NGC 1365
Constellation	Fornax
Right ascension	3h34m
Declination	–36°08′
Magnitude	9.3
Size	8.9′ by 6.5′
Type	Spiral galaxy

Barred spiral galaxies form a class of celestial objects that fascinate professional and amateur astronomers alike. Unfortunately for northern observers, the best example — NGC 1365 — languishes in the nearly invisible constellation Fornax the Furnace, more than one-third the way from the celestial equator to the South Celestial Pole.

A barred spiral galaxy contains a lane of stars, gas, and dust slashing across its central region. It has a small central bulge of stellar material. The spiral arms begin at both ends of the bar.

Astronomers using the Hubble Space Telescope revealed NGC 1365 feeds material into its central region, igniting massive star birth and causing its central bulge of stars to grow. The material also fuels a supermassive black hole in the galaxy's core.

Although it's bright, NGC 1365 isn't all that easy to star-hop to. To do so, first find a triangle of three faint stars, magnitude 6.4 Chi^1 (χ^1), magnitude 5.7 Chi^2 (χ^2), and magnitude 6.5 Chi^2 (χ^3) Fornacis. From Chi^2, which is the brightest, move 1.3° east-southeast.

Through even a 4-inch telescope at a dark site, you'll see NGC 1365's bar shape and brighter central region. Increase the magnification, and notice how the bar near the core appears dimmer than it does farther out.

An 8-inch scope shows the spiral arms. The brighter one extends northward from the bar's west end. The other arm, only slightly fainter, appears somewhat blotchy, revealing huge star-forming regions within it.

OBJECT #869	NGC 1374
Constellation	Fornax
Right ascension	3h35m
Declination	–35°14′
Magnitude	11.0
Size	2.6′ by 2.4′
Type	Spiral galaxy

This object lies within the Fornax Galaxy Cluster. It is a round glow that shows no features through amateur telescopes. Observers might be amazed that astronomers classify it as a spiral galaxy, rather

than an elliptical one. NGC 1374 falls in Edwin Hubble's class S0, which was the transition between ellipticals and spirals in his famous "tuning fork" diagram.

NGC 1375 lies only 2.5′ to the south. This magnitude 12.2 elliptical glow also shows no details. It measures 2.3′ by 0.9′. To find it, head 1.6° east-northeast from magnitude 5.7 Chi^2 (χ^2) Fornacis.

OBJECT #870	NGC 1379
Constellation	Fornax
Right ascension	3h36m
Declination	–35°27′
Magnitude	11.0
Size	2.6′ by 2.5′
Type	Elliptical galaxy

This galaxy also lies within the Fornax Galaxy Cluster. It appears round, but you'll have to look past the magnitude 7.2 star GSC 7034:577 to see it. You'll find it 1.7° east of magnitude 5.7 Chi^2 (χ^2) Fornacis.

OBJECT #871	NGC 1380
Constellation	Fornax
Right ascension	3h37m
Declination	–34°59′
Magnitude	10.0
Size	4.8′ by 2.8′
Type	Spiral galaxy

From a dark site, you can spot this elongated galaxy through any size telescope. Through a 12-inch scope, NGC 1380 looks like a fuzzy football. The galaxy's brightness remains constant until you're three-quarters of the way to an edge. To find this target, look 1.9° east-northeast of magnitude 5.7 Chi^2 (χ^2) Fornacis.

OBJECT #872	NGC 1387
Constellation	Fornax
Right ascension	3h37m
Declination	–35°31′
Magnitude	10.8
Size	3.1′ by 2.8′
Type	Spiral galaxy

NGC 1387 is yet another mainly featureless elliptical within the Fornax Galaxy Cluster. It's relatively bright, however, so you should have no trouble tracking it down. Look for it 1.9° east of magnitude 5.7 Chi^2 (χ^2) Fornacis.

OBJECT #873	NGC 1395
Constellation	Eridanus
Right ascension	3h39m
Declination	–23°02′
Magnitude	9.8
Size	11.0′ by 7.6′
Type	Elliptical galaxy

NGC 1365 lies 1.8° southeast of magnitude 4.3 Tau^5 (τ^5) Eridani. You'll see this galaxy from a dark site through any telescope, but an 8-inch or larger instrument will reveal NGC 1365's bright, nonstellar central region and the halo that surrounds it.

Object #874 NGC 1398 Sean and Renee Stecker/Adam Block/NOAO/AURA/NSF

OBJECT #874	NGC 1398
Constellation	Fornax
Right ascension	3h39m
Declination	–26°20′
Magnitude	9.8
Size	7.2′ by 5.2′
Type	Barred spiral galaxy

This spiral galaxy's core is so bright that it masks its delicate spiral arms when viewed through small telescopes. I've only caught glimpses of the arms when I've observed NGC 1398 through a 14-inch telescope at high power. Here's an object that really will reward views through scopes with apertures 20 inches of larger.

This object's bar runs roughly north-to-south and is only slightly fainter than the rest of the wide central region. This galaxy lies 1.6° due north of magnitude 6.0 Tau (τ) Fornacis.

OBJECT #875	NGC 1399
Constellation	Fornax
Right ascension	3h39m
Declination	–35°27′
Magnitude	9.9
Size	8.1′ by 7.6′
Type	Elliptical galaxy

This really bright galaxy appears ever-so-slightly oblong under high magnifications. To find NGC 1399, draw a line from magnitude 6.4 Chi^1 (χ^1) to magnitude 5.7 Chi^2 (χ^2) Fornacis, and extend that line 5 times the distance between those two stars.

The large central region takes up three-quarters of this galaxy's diameter. Only a quickly fading fuzz lies outside.

OBJECT #876	NGC 1404
Constellation	Fornax
Right ascension	3h39m
Declination	–35°35′
Magnitude	9.7
Size	4.8′ by 3.9′
Type	Elliptical galaxy

This galaxy lies just under 10′ south-southeast of NGC 1399. Although both galaxies are similar ellipticals, NGC 1399 is bigger and slightly brighter. The magnitude 8.1 star SAO 194428 lies just 3′ south-southeast of NGC 1404.

OBJECT #877	NGC 1407
Constellation	Eridanus
Right ascension	3h40m
Declination	–18°35′
Magnitude	9.8
Size	4.6′ by 4.3′
Type	Elliptical galaxy

Our next target forms a pair with another elliptical galaxy, magnitude 10.9 NGC 1400, which lies about 12′ southwest of NGC 1407. A magnification of 100× through an 8-inch telescope will show both objects well. In no size instrument will you see details other than a thin halo around the brighter galaxy. NGC 1407 lies 1.5° southeast of the magnitude 5.2 star 20 Eridani.

OBJECT #878	NGC 1421
Constellation	Eridanus
Right ascension	3h43m
Declination	–13°29′
Magnitude	11.4
Size	3.1′ by 1.0′
Type	Spiral galaxy

This galaxy lies 1.6° south-southwest of magnitude 4.4 Pi (π) Eridani. It stretches 5 times as long as it is wide and aligns north-south.

Through a small telescope, the core appears stellar, surrounded by a haze. Instruments with apertures above 12′ resolve the thin spiral arms. Crank up the magnification past 200×, and look for bright star-forming regions within the arms. The southern arm stretches twice as far as the northern one, which seems to end abruptly.

OBJECT #879	NGC 1433
Constellation	Horologium
Right ascension	3h42m
Declination	–47°13′
Magnitude	10.0
Size	5.5′ by 3.2′
Type	Barred spiral galaxy

Our next target makes a worthy observation, but you may hunt for it a while because there's no bright star nearby. To find NGC 1433, look 7.5° southwest of magnitude 3.9 Alpha (α) Horologii. The core of this galaxy appears broad and bright. You'll have no trouble spotting the long bar, which orients east-west. Through a 16-inch scope, look for a larger outer halo that begins to show hints of spiral arms.

OBJECT #880	NGC 1444
Constellation	Perseus
Right ascension	3h49m
Declination	52°40′
Magnitude	6.6
Size	4′
Type	Open cluster

This cluster is basically the magnitude 6.7 star SAO 24248 and about 10 others. It is bright, however. To find it, look 3.5° northwest of magnitude 4.3 Lambda (λ) Persei.

OBJECT #881	NGC 1448
Constellation	Horologium
Right ascension	3h45m
Declination	–44°39′
Magnitude	10.8
Size	6.5′ by 1.4′
Type	Spiral galaxy

Our next target lies 5.8° west-southwest of magnitude 3.9 Alpha (α) Horologii. NGC 1448 is one of the "needles" in space — a thin spiral galaxy seen edge-on. Through a 12-inch telescope you'll see a bright spindle four or five times as long as it is wide oriented northeast to southwest. The galaxy brightens gradually from the ends to its broad core. The magnitude 12.9 star GSC 7575:918 shines just southeast of the galaxy's center.

Object #882 The Pleiades (M45) Tad Denton/Adam Block/NOAO/AURA/NSF

OBJECT #882	M45
Constellation	Taurus
Right ascension	3h47m
Declination	24°07′
Magnitude	1.2
Size	110′
Type	Open cluster
Other name	The Pleiades

One of the finest of naked-eye objects also ranks as the sky's brightest star cluster. It's the Pleiades, also known as the Seven Sisters and M45.

Many ancient astronomers classified the Pleiades as a separate constellation. And why not? This object shines brighter and is more recognizable than many of the 88 constellations that currently fill the sky.

Messier included the Pleiades as the 45th and final entry in the first version of his *Catalog of Nebulae and Clusters of Stars*, which he presented to the Paris Academy of Sciences February 16, 1771. Why he included such a bright, well-known object remains a mystery. Even in Messier's day, most people — and certainly all observers — knew the Pleiades was no comet.

Astronomers call the Pleiades the Seven Sisters, but most people casually glancing at this star cluster see only six stars. Perhaps the hidden sister is too shy? More likely, it's that our observing is too casual.

Amateur astronomers with good vision can spot more than the six, or seven stars. My record is 11 Pleiads naked eye, but I've only tried once. And, on the same night I made that sighting, an observing buddy standing next to me saw 13 stars within the cluster.

Although M45 is a great naked-eye target, it also looks terrific through binoculars. Most amateur astronomers choose binoculars that magnify between 10 and 15 times to observe the Pleiades.

OBJECT #883	32 Eridani
Constellation	Eridanus
Right ascension	3h54m
Declination	–2°57′
Magnitudes	4.8/6.1
Separation	6.8″
Type	Double star

This binary sits in a lonely part of northern Eridanus near the Taurus border. It's worth seeking out, however, because the two stars have a nice color contrast, most often described by observers as yellow and blue.

Object #884 NGC 1491 Adam Block/Mount Lemmon SkyCenter/University of Arizona

OBJECT #884	NGC 1491
Constellation	Perseus
Right ascension	4h03m
Declination	51°19′
Size	25′ by 25′
Type	Emission nebula

This nebula lies 1.1° north-northwest of magnitude 4.3 Lambda (λ) Persei. A 10-inch telescope equipped with a nebula filter clearly shows its bright fan shape. Start with a magnification of about 75× to keep the nebula bright, then gradually increase the power.

The nebula appears brightest on the western edge and fades gradually toward the more diffuse eastern side. A 16-inch scope reveals striations that extend away from the nebula's southern tip. Don't expect to see a nebula that even approaches the cataloged size of 25′. Through the eyepiece it scarcely spans 4′.

OBJECT #885	NGC 1493
Constellation	Horologium
Right ascension	3h58m
Declination	−46°12′
Magnitude	11.2
Size	3.5′ by 3.2′
Type	Barred spiral galaxy

Our next target lies in a region bereft of bright stars 6.4° south-southwest of magnitude 3.9 Alpha (α) Horologii. NGC 1493 is a face-on barred spiral galaxy, but you won't see the bar through a telescope smaller than 30′ in aperture. What you will see is an unusually luminous center. The galaxy appears as a faint, circular smudge that gradually brightens to a central core.

Object #886 The California Nebula (NGC 1499) Adam Block/NOAO/AURA/NSF

OBJECT #886	NGC 1499
Constellation	Perseus
Right ascension	4h01m
Declination	36°37′
Size	160′ by 40′
Type	Emission nebula
Other name	The California Nebula

Our next celestial wonder is a rarity: a nebula you can spot without a telescope. It's also the only celestial object named for one of America's 50 states.

This unusually shaped nebula resides in one of the Milky Way's outer spiral arms called the Orion arm. The nebula's luminous portion spans 100 light-years. However, this entire region contains vast hydrogen clouds from which many bright, massive stars have formed. Astronomers labeled the family of young stars here the Perseus OB2 association.

The bright star 0.2° south of the nebula is magnitude 4.0 Menkib (Xi [ξ] Persei). It belongs to the Perseus OB2 association, and it makes the California nebula glow. This nebula is unusual because it glows strongly not only due to Hydrogen-alpha (Hα) emission, but also Hydrogen-beta (Hβ).

Hydrogen atoms emit light because of the elevation and subsequent drop in energy level of electrons. The electrons gain energy by interacting with energy from Xi Persei. The larger the "fall," or number of energy levels an electron drops, the more energetic is the light released.

In this case, a one-level drop creates Hα light with a wavelength of 656.3 nm. An electron dropping two levels creates Hβ light with a wavelength of 486.1 nm. In most nebulae, electrons fall just one level, emitting Hα light.

From a dark site, sharp-eyed observers can spot the California Nebula with their naked eyes — almost. Use a nebula filter labeled either "Hβ" or "Deep-sky." An OIII filter reduces what you can see.

When you switch to a telescope, select the eyepiece that provides the lowest magnification. Don't forget to attach a filter. If even that view isn't wide enough to take in the whole object, slowly move the telescope back and forth.

Object #887 The Oyster Nebula (NGC 1501) Adam Block/NOAO/AURA/NSF

OBJECT #887	NGC 1501
Constellation	Camelopardalis
Right ascension	4h07m
Declination	60°55′
Magnitude	11.5
Size	52″
Type	Planetary nebula
Other name	The Oyster Nebula, the Blue Oyster Nebula

Move 6.9° west of magnitude 4.0 Beta (β) Camelopardalis to find planetary nebula NGC 1501. Amateur astronomers call this object the Oyster Nebula. *Astronomy* magazine Contributing Editor Stephen James O'Meara adds that, on images, a shell of pale blue gas surrounds NGC 1501's central star. For that reason, he added the "Blue" to the common name.

A 10-inch telescope shows a circular disk. Through a 16-inch scope at magnifications above 350×, however, you'll note that the planetary is ever-so-slightly oval in an east-west orientation.

The magnitude 14 central star is easier to see than its magnitude suggests. It peeks through a slightly darker center that suggests the presence of a thick ring structure. Through the larger instrument, the planetary's face appears patchy, with several small dark areas visible.

OBJECT #888	NGC 1511
Constellation	Hydrus
Right ascension	4h00m
Declination	–67°38′
Magnitude	11.1
Size	3.5′ by 1.3′
Type	Spiral galaxy

You'll find our next target 3.2° south-southeast of magnitude 3.8 Beta (β) Reticuli. Two magnitude 14.5 stars, one 1′ east and the other 1′ west, flank NGC 1511. Seen from the edge, the galaxy appears three times as long as it is wide. Its brightness is uniform except at its faint tips.

OBJECT #889	Kemble's Cascade
Constellation	Camelopardalis
Right ascension	4h00m
Declination	63°00′
Size	2.5°
Type	Asterism

This object is a chance alignment of stars first described by the late Franciscan amateur astronomer Father Lucian Kemble, who found it while scanning the sky through binoculars. Because Kemble identified it, amateur astronomers now call it Kemble's Cascade.

A magnification of 15× works best for framing the starry chain. The Cascade is 15 stars that stretch 2.5°. Most of the stars range from 7th to 9th magnitude. The exception is the 5th-magnitude sparkler called SAO 12969 that sits in the center.

Want some extra value in your observing? At the southeast end of Kemble's Cascade, and easily visible in the same field of view, sits the tight open cluster NGC 1502 (R.A. = 4h08m; Dec. = 62°20′; Size =7′). You'll need a telescope to see its individual stars, but you won't miss its overall magnitude 5.7 glow. NGC 1502 sometimes goes by the name the Jolly Roger Cluster.

OBJECT #890	NGC 1512
Constellation	Horologium
Right ascension	4h04m
Declination	–43°21′
Magnitude	10.2
Size	8.3′ by 3.6′
Type	Barred spiral galaxy

Our next object lies 2.1° west-southwest of magnitude 3.9 Alpha (α) Horologii. This barred spiral galaxy has a ring around its central region, but you won't see it through amateur telescopes because it lies so close to the core. The core itself appears bright. Look for the nearly stellar nucleus. Through an 8-inch telescope, NGC 1512 looks like an oval twice as long as it is wide. Double the aperture to 16′, and you'll just be able to see the short bar. Notice that the eastern side looks a bit brighter than the western one.

When you're done with NGC 1512, look for magnitude 12.4 NGC 1510 only 5′ to the southwest.

OBJECT #891	NGC 1513
Constellation	Perseus
Right ascension	4h10m
Declination	49°31′
Magnitude	8.4
Size	12′
Type	Open cluster

You'll find this nice cluster 1.4° northwest of magnitude 4.1 Mu (μ) Persei, or 1° southeast of magnitude 4.3 Lambda (λ) Persei. Through a 4-inch telescope, you'll see some three dozen stars spread evenly across the field of view. An 8-inch scope will increase your star count to 50.

Object #892 The Crystal Ball Nebula (NGC 1514) Adam Block/NOAO/AURA/NSF

OBJECT #892	NGC 1514
Constellation	Taurus
Right ascension	4h09m
Declination	30°47′
Magnitude	10.9
Size	114″
Type	Planetary nebula
Other name	The Crystal Ball Nebula

Look at our next target through an 8-inch telescope at 200×, and use a nebula filter. You'll see a round haze that amateur astronomers recently began calling the Crystal Ball Nebula. This object is definitely brighter along its rim. Bright knots intermingle with the gas on the northwestern and southeastern sides. The magnitude 9.4 central star is SAO 57020, and, yes, it can be a bit distracting. The filter will help dim it some. If you still have trouble spotting it, try increasing the magnification to 150× or beyond. NGC 1514 sits 3.4° east-southeast from magnitude 2.9 Atik (Zeta [ζ] Persei).

OBJECT #893	NGC 1527
Constellation	Horologium
Right ascension	4h08m
Declination	−47°53′
Magnitude	10.7
Size	4.2′ by 1.8′
Type	Spiral galaxy

Our next target sits 5.7° south of magnitude 3.9 Alpha (α) Horologii. Through an 8-inch telescope, it appears as a lens-shaped haze with a bright central region. Increasing the scope's aperture won't yield any additional details.

OBJECT #894	NGC 1528
Constellation	Perseus
Right ascension	4h15m
Declination	51°12′
Magnitude	6.4
Size	18′
Type	Open cluster

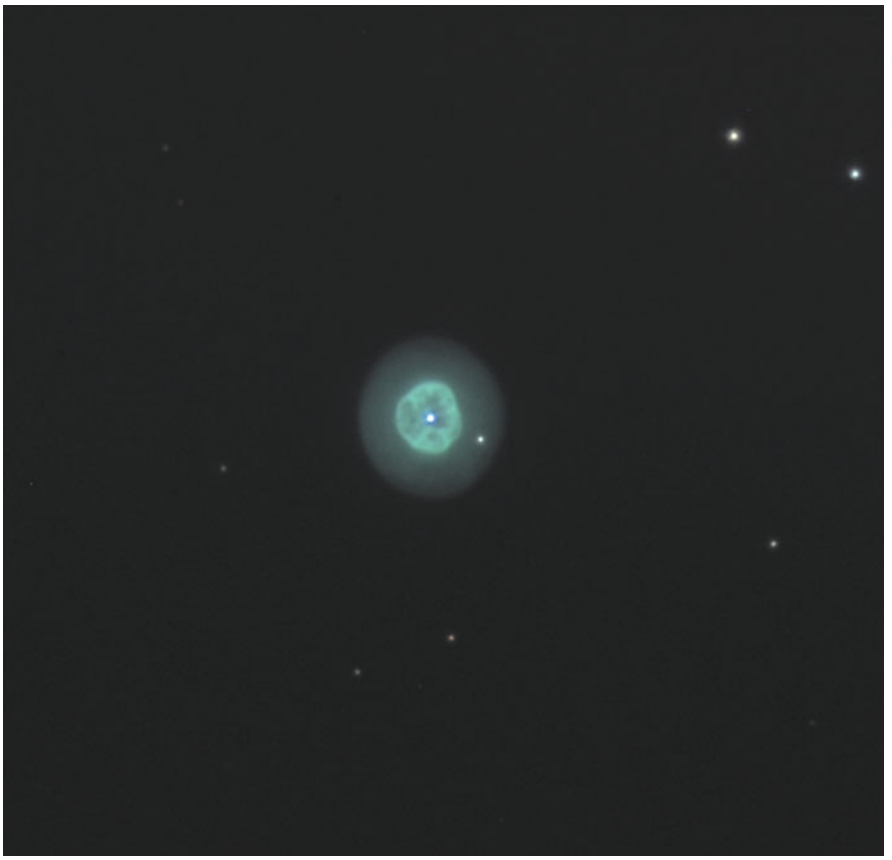
Our next target lies 1.6° east-northeast of magnitude 4.3 Lambda (λ) Persei. Sharp-eyed observers may just detect NGC 1528 as a hazy star from a dark observing site. Through a 4-inch telescope, use 150× to spot 50 member stars. Many stars group into whirls and other patterns. An 8-inch scope will show nearly 100 stars. The brightest star in the cluster, magnitude 8.8 SAO 24496, sits just west of center.

OBJECT #895	NGC 1532
Constellation	Eridanus
Right ascension	4h12m
Declination	–32°52′
Magnitude	9.9
Size	11.2′ by 3.2′
Type	Spiral galaxy

This object is a double galaxy. It combines the magnificent edge-on spiral NGC 1532 with magnitude 11.7 elliptical NGC 1531, which sits less than 2′ to the northwest. But NGC 1532 is the real treat here. It appears nearly 6 times as long as it is wide.

Through a 16-inch or larger telescope, you'll see the spiral arms extend in a north-northeast to south-southwest orientation. With magnifications of 200× or more, the brilliant core appears surrounded by an oblong haze. And as long as you have a 16-inch scope at your disposal, look for the magnitude 15.2 irregular galaxy PGC 14664. It lies 12.5′ southeast of NGC 1532.

Find this pair 1.5° northwest of magnitude 3.6 Upsilon^4 (υ^4) Eridani. Star charts also identify this star as 41 Eridani).



Object #896 Cleopatra's Eye (NGC 1535) Adam Block/NOAO/AURA/NSF

OBJECT #896	NGC 1535
Constellation	Eridanus
Right ascension	4h14m
Declination	−12°44′
Magnitude	9.6
Size	18″
Type	Planetary nebula
Other names	Cleopatra's Eye, the Celestial Jellyfish, the Ghost of Neptune Nebula

This pretty object lies 4° east-northeast of magnitude 3.0 Zaurak (Gamma [γ] Eridani). The planetary is nice and bright, and it takes high powers well.

Through a 6-inch telescope, NGC 1535 has a sharply defined disk surrounded by a faint envelope. Double that aperture to 12′, and you'll begin to pick up this object's color. Now, crank the magnification past 300×, and you'll observe a dark hollow around the central star. At this aperture and power, you'll note that the contrast between the sharp inner disk and the fainter outer shell is at its maximum.

Long known as Cleopatra's Eye, American amateur astronomer Walter Scott Houston called it a "celestial jellyfish." *Astronomy* magazine Contributing Editor Stephen James O'Meara has given this planetary yet another moniker: the Ghost of Neptune. His observations at 72× of NGC 1535 as a pale blue disk led him to label it so.

OBJECT #897	NGC 1537
Constellation	Eridanus
Right ascension	4h14m
Declination	–31°39′
Magnitude	10.5
Size	3.9′ by 2.6′
Type	Elliptical galaxy

Our next target sits 2.3° north-northwest of magnitude 3.6 Upsilon[4] (υ^4) Eridani. This galaxy appears oval, about 50% longer than wide. The bright central region takes up three-quarters of the galaxy's length and shows no detail. A thin halo surrounds the core.

OBJECT #898	NGC 1543
Constellation	Reticulum
Right ascension	4h13m
Declination	–57°44′
Magnitude	9.7
Size	7.2′ by 4.9′
Type	Barred spiral galaxy

This moderately bright galaxy lies 1.6° north-northwest of magnitude 4.4 Epsilon (ε) Reticuli. Through an 8-inch telescope, you'll easily see the galaxy's bright bar. The magnitude 8.7 star SAO 233433 lies 5′ to the south-southwest.

OBJECT #899	NGC 1545
Constellation	Perseus
Right ascension	4h21m
Declination	50°15′
Magnitude	6.2
Size	12′
Type	Open cluster

This bright open cluster lies 2.3° east of magnitude 4.3 Lambda (λ) Persei. Look for it as a faint, fuzzy star with your naked eyes. Through a 4-inch telescope, you'll see about 20 stars. The three brightest form an isosceles triangle near NGC 1545's center. In order of brightness, they are magnitude 7.1 SAO 24556, magnitude 8.1 SAO 24555, and magnitude 9.3 SAO 24549.

Spend some time with this cluster at magnifications above 200×. You'll see many colored stars and also several nice double stars.

OBJECT #900	NGC 1549
Constellation	Dorado
Right ascension	4h16m
Declination	–55°36′
Magnitude	9.5
Size	5.4′ by 4.8′
Type	Spiral galaxy

This galaxy interacts gravitationally with our next target, NGC 1553. You'll find NGC 1549 sitting 2.6° west-southwest of magnitude 3.3 Alpha (α) Doradus. This galaxy appears more elliptical than spiral. It has a large, evenly illuminated central region.

OBJECT #901	NGC 1553
Constellation	Dorado
Right ascension	4h16m
Declination	–55°47′
Magnitude	9.1
Size	6.3′ by 4.4′
Type	Spiral galaxy

Look 12′ south-southeast of NGC 1549, and you'll spot NGC 1553. This pair is part of the Dorado Group of galaxies. Through any size telescope, NGC 1553 appears oval, bright, and featureless, except for a thin halo that surrounds the bright central region.

OBJECT #902	Chi (χ) Tauri
Constellation	Taurus
Right ascension	4h23m
Declination	25°38′
Magnitudes	5.5/7.6
Separation	19.4″
Type	Double star

You'll find this star equidistant from the Pleiades (M45) and magnitude 3.5 Epsilon (ε) Tauri. Although most observers see some combination of a yellowish primary and a bluish secondary, others have seen the brighter star as bluish-white and its companion as deep blue. Decide for yourself by cranking up the magnification as much as the sky will allow and moving first the primary, then the secondary, out of the field of view. Seeing the stars alone will give you a better gauge of their true colors.

OBJECT #903	NGC 1554/55
Constellation	Taurus
Right ascension	4h22m
Declination	19°32′
Size	1′
Type	Emission nebulae
Other names	Struve's Lost Nebula; Hind's Variable Nebula

Our next target combines two objects in one. Observers refer to NGC 1554 as Struve's Lost Nebula, and NGC 1555 is Hind's Variable Nebulae. Note the name for NGC 1554, and don't look for it because it's not there. Astronomers now assign the same position to these objects, and it proves a tough catch even through large telescopes.

Both common names refer to the nineteenth-century astronomers who discovered the respective objects. British astronomer John Russell Hind (1823–1895) discovered NGC 1555 October 11, 1852. It remained visible for a few years but then faded from view.

Several noted astronomers, among them Russian astronomer Otto Wilhelm von Struve (1819–1905), subsequently observed Hind's Variable Nebula, but it faded from view by 1868. When examining the region early in 1868, Struve found another small nebula. He gave its position as 4′ to the west-southwest of T Tauri. Subsequent observations showed no object at the position he noted. This object also proved difficult for astronomers to observe consistently until American astronomer Edward Emerson Barnard (1857–1923) looked into the matter in 1890.

Barnard found a position error for the star T Tauri and suggested that other astronomers had been looking in the wrong place for NGC 1554. On March 24 of that year, he glimpsed a faint nebula at the position he calculated along with NGC 1555 through the 36-inch refractor at Lick Observatory. No observer has seen NGC 1554 since. Struve's nebula is indeed lost.

To start your search for Hind's Variable Nebula, head 1.7° west-northwest of magnitude 3.5 Epsilon (ε) Tauri. Near that position, you'll see the magnitude 8.4 star SAO 93887. From there, move 5′ northeast, and you'll encounter the variable star T Tauri, which usually shines at magnitude 9.6. NGC 1554 appears as a faint wisp of nebulosity near T Tauri.

I last observed this object in February 2009. I was using a 30-inch reflector under an ultra-dark sky at the Rancho Hidalgo astronomy community, near Animas, New Mexico. Through that monstrous scope, NGC 1555 appeared as an unevenly lit wedge of light.

OBJECT #904	NGC 1559
Constellation	Reticulum
Right ascension	4h18m
Declination	–62°47′
Magnitude	10.4
Size	4.3′ by 2.2′
Type	Barred spiral galaxy

For our next target, aim your telescope 0.5° southeast of magnitude 3.3 Alpha (α) Reticuli. Through an 8-inch telescope at a dark site, you'll see a roughly rectangular shape twice as long as it is wide. Only through the largest amateur instruments will you see any mottling.

OBJECT #905	Theta (θ) Reticuli
Constellation	Reticulum
Right ascension	4h18m
Declination	–63°15′
Magnitudes	6.2/8.2
Separation	2.9″
Type	Double star

This far-southern binary combines a blue primary with a white secondary. Theta is a close double, so use a magnification above 150× to assure a clean split. To locate Theta, look 0.9° south-southeast of magnitude 3.3 Alpha (α) Reticuli.

OBJECT #906	NGC 1566
Constellation	Dorado
Right ascension	4h20m
Declination	–54°56′
Magnitude	9.4
Size	7.1′ by 4.8′
Type	Spiral galaxy

Pan 2° west of Alpha (α) Doradus to find this bright spiral. It belongs to the Dorado Galaxy group, which lies 55 million light-years away. Through a 10-inch telescope, crank the magnification to 200×, and you'll spot the elegant spiral structure — one arms starts at the north end of the central region and curves eastward; the other starts at the south and curves westward. Look for a bright star-forming region that appears like a faint star at the north end of the western spiral arm.

NGC 1566 lies above the center of a right triangle made of three stars: magnitude 8.1 SAO 233486, magnitude 9.9 SAO 233482, and magnitude 10.1 GSC 8505:1410.