February

OBJECT #100	NGC 2685
Constellation	Ursa Major
Right ascension	8h56m
Declination	58°44′
Magnitude	11.1
Size	4.9′ by 2.4′
Type	Spiral galaxy
Other names	The Helix Galaxy, the Pancake Galaxy

Astronomers classify this unusual lenticular galaxy as a polar ring galaxy. Several filamentary strands, made up of knots of luminous star-forming regions, form a helical band perpendicular to the galaxy's main disk and centered on its nucleus.

These structures suggest that NGC 2685 once had a companion, perhaps like one of the Milky Way's neighboring Magellanic Clouds. The main galaxy captured the satellite into a polar orbit, and its stars eventually merged with those of the larger system. What was left? Only the gas and dust of the smaller galaxy. New stars formed from this material to produce the luminous ring. It is possible that if the Magellanic Clouds had been closer to the Milky Way, they too would have created a polar ring around our galaxy.

To find NGC 2685, look 3.8° east-southeast of magnitude 3.4 Muscida (Omicron [*o*] Ursae Majoris). Although interesting, the galaxy isn't bright. At low magnifications, you'll see a disk-shaped, evenly illuminated glow three times as long as it is wide.

Point a 14-inch or larger telescope at this object, and go after the ephemeral ring that gives the Helix Galaxy its common name. Use a magnification around 200× to start, and increase the power if sky conditions are good enough. I've had some luck viewing the ring by moving NGC 2685's main mass just out of the eyepiece's field of view.

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OBJECT #101	NGC 2736
Constellation	Vela
Right ascension	9h00m
Declination	−45°57′
Size	20′
Type	Supernova remnant
Other names	The Pencil Nebula, Herschel's Ray

The Pencil Nebula forms a small part of the Vela supernova remnant (SNR), which lies in the southern constellation Vela the Sails. Amateur astronomers dubbed this object the Pencil because, through a telescope, it appears long, straight, and one end looks "sharpened."

British astronomer Sir John Herschel (1792–1871) discovered the Pencil Nebula in 1835 while he was staying in South Africa. He described it as "an extraordinary long narrow ray of excessively feeble light."

The Pencil Nebula measures about 0.75 light-year across, while the Vela supernova remnant spans 114 light-years. The remnant lies about 815 light-years away.

The best way to observe the Pencil Nebula is to use a 12-inch or larger telescope with a low-power eyepiece equipped with a nebula filter, such as an OIII. Either disengage your telescope's drive motor or set its slewing speed at "medium," and scan the area.

OBJECT #102	NGC 2768
Constellation	Ursa Major
Right ascension	9h12m
Declination	60°02′
Magnitude	9.9
Size	6.4′ by 3.0′
Type	Elliptical galaxy

Astronomers classify this galaxy as elliptical, but it's definitely lenticular. It's easily three times as long as it is wide. The large central region takes up two-thirds of the galaxy's width. NGC 2768's core has even illumination, as does the object's outer halo. Although this galaxy shone brightly when I observed it through a 30-inch telescope, I didn't see any details.

Object #103 NGC 2775 Jeff Newton/Adam Block/NOAO/AURA/NSF

OBJECT #103	NGC 2775
Constellation	Cancer
Right ascension	9h10m
Declination	7°02′
Magnitude	10.1
Size	4.6′ by 3.7′
Type	Spiral galaxy
Other name	Caldwell 48

You'll find our next target 3.8° east-northeast of magnitude 3.1 Zeta (ζ) Hydrae. Seen through an 8-inch telescope, this galaxy appears oval oriented north-northwest to south-southeast. A 12-inch scope at 250× reveals the evanescent outer halo.

Through even larger instruments, look for two other faint galaxies, magnitude 13.6 NGC 2773, which sits 12′ to the northwest, and magnitude 13.1 NGC 2777, which lies 12′ to the north-northeast. NGC 2777 travels through space with NGC 2775, but NGC 2773 lies four times as far away and isn't associated with the others.

OBJECT #104	NGC 2784
Constellation	Hydra
Right ascension	9h12m
Declination	–24°10′
Magnitude	10.0
Size	5.5′ by 2.4′
Type	Spiral galaxy

Our next target lies 1.9° north-northeast of magnitude 4.6 Kappa (κ) Pyxidis. I imagine a disk within a disk when I view this galaxy. Through an 8-inch telescope, you'll see the elongated central region surrounded by a similarly shaped halo. The halo appears quite thick. Both the core and the halo

tilt east-northeast to south-southwest. Less than 1′ from the galaxy's northeastern tip lies the magnitude 12.9 star GSC 6586:357.

OBJECT #105	NGC 2787
Constellation	Ursa Major
Right ascension	9h19m
Declination	69°12′
Magnitude	10.9
Size	3.1′ by 1.8′
Type	Spiral galaxy

Now here's a bit of an odd duck. Although NGC 2787 appears bright, it's better seen through large apertures. When I first viewed this galaxy through a 30-inch telescope at the Rancho Hidalgo astronomy and equestrian village in Animas, New Mexico, I thought it might be a barred spiral. Astronomers, however, put it in a different class — barred lenticular. Well, I saw the bar. It puzzled me at first, because the bar's long axis tilts a bit to the overall long axis of NGC 2787. The central region appeared much brighter than the outer areas, but I saw no other details.

OBJECT #106	NGC 2805
Constellation	Ursa Major
Right ascension	9h20m
Declination	64°06′
Magnitude	10.9
Size	6.3′ by 4.8′
Type	Spiral galaxy

You'll find our next object 1.2° east-northeast of magnitude 4.7 Tau (τ) Ursae Majoris. Although its magnitude is relatively bright, it spreads out quite a bit. Through a 12-inch telescope at 200×, you'll see a nearly stellar central region surrounded by irregularly bright haze. The overall shape is oval in an east-west orientation.

OBJECT #107	NGC 2808
Constellation	Carina
Right ascension	9h12m
Declination	–64°52′
Magnitude	6.3
Size	13.8′
Type	Globular cluster

This magnificent object — the sky's 10th-brightest globular cluster — is visible to sharp-eyed observers under a dark sky without optical aid. It lies in an incredible star field 3.7° west of magnitude 3.1 Upsilon (υ) Carinae.

Although brilliant, you'll have difficulty resolving this cluster's stars through any telescope smaller than a 14-inch. An 8-inch scope shows a blazing core surrounded by an unevenly illuminated halo.

OBJECT #108	NGC 2811
Constellation	Hydra
Right ascension	9h16m
Declination	–16°19′
Magnitude	11.4
Size	2.5′ by 0.9′
Type	Spiral galaxy

Our next object lies 6.1° west-southwest of magnitude 5.1 Kappa (κ) Hydrae. Through telescopes smaller than 10′ in aperture, this object appears evenly illuminated, tilted in a north-northeast to south-southwest orientation. Magnifications below 200× show a sliver four times as long as it is wide. Only through larger scopes will you begin to fatten out the central region.

OBJECT #109	NGC 2818
Constellation	Pyxis
Right ascension	9h16m
Declination	–36°37′
Magnitude	8.2
Size	9′
Type	Open cluster

Our next target lies 7.4° east-southeast of magnitude 4.0 Beta (β) Pyxidis. It's an open star cluster with a planetary nebula inside. Through most telescopes, the open cluster (NGC 2818) appears as a loose group of two dozen stars. Most of its members glow below 12th magnitude, but the cluster stands out thanks to the sparse surrounding star field.

The planetary nebula (NGC 2818A) appears as a small, moderately bright object with a dumbbell shape. An 8-inch scope shows both lobes, but you'll need a 20-inch or larger instrument to see any other details.

OBJECT #110	38 Lyncis
Constellation	Lynx
Right ascension	9h19m
Declination	36°48′
Magnitudes	3.9/6.6
Separation	2.7″
Type	Double star

Each of the stars in this pair appears white. The separation is close, so crank the magnification past 150×. The star 38 Lyn sits in a no-man's land of faint stars. Look for it not quite 2.5° north of magnitude 3.1 Alpha (α) Lyncis.

OBJECT #111	NGC 2832
Constellation	Lynx
Right ascension	9h20m
Declination	33°44′
Magnitude	11.9
Size	3.0′ by 2.1′
Type	Elliptical galaxy
Notes	in Abell 779

Our next object resides in galaxy cluster Abell 779, which lies less than 0.7° south-southwest of magnitude 3.1 Alpha (α) Lyncis. NGC 2832 is the brightest member of the cluster. It has an oval shape and measures 50% longer than it is wide oriented roughly northwest to southeast.

If you have access to a 16-inch or larger telescope, study the area around NGC 2832, and see how many other faint galaxies you can spot. The magnitude 13.4 elliptical galaxy NGC 2831 lies only 24″ to the southwest. Even fainter, the magnitude 13.9 lens-shaped spiral NGC 2830 lies a bit more than 1′ to the west-southwest.

Want more? Just 5′ west of NGC 2832 lies magnitude 14.4 NGC 2825, and magnitude 14.5 NGC 2834 lies 4′ southeast of our starting point, NGC 2832.

OBJECT #112	NGC 2835
Constellation	Hydra
Right ascension	9h18m
Declination	−22°21′
Magnitude	10.3
Size	6.6′ by 4.4′
Type	Spiral galaxy

To find our next target, look 3.7° north-northwest of magnitude 4.7 Theta (θ) Pyxidis. Through an 8-inch telescope at 150×, this object appears round, faint, and stretched a bit on a north-south line. A 16-inch scope at 300× starts to reveal the galaxy's spiral structure. Its arms appear thin and broken. The magnitude 12.1 star GSC 6040:550 lies on NGC 2835's eastern edge.

OBJECT #113	NGC 2841
Constellation	Ursa Major
Right ascension	9h22m
Declination	50°59′
Magnitude	9.3
Size	8.1′ by 3.5′
Type	Spiral galaxy

What a gorgeous object! This galaxy tilts southeast to northwest and displays a classic disk appearance. Its nucleus is wide and bright. Through an 8-inch telescope, you'll see several dark regions within the tightly wound spiral arms, but the arms themselves are tough to see even at high powers. You'll find this treat 1.8° west-southwest of magnitude 3.2 Theta (θ) Ursae Majoris.

OBJECT #114	NGC 2859
Constellation	Leo Minor
Right ascension	9h24m
Declination	34°31′
Magnitude	10.9
Size	4.6′ by 4.1′
Type	Spiral galaxy

To find this object, first locate magnitude 3.1 Alpha (α) Lyncis. Then scan just 0.7° east. Through a 10-inch telescope, this galaxy tips north-northwest to east-southeast. Its thick outer halo takes up 25% of the galaxy's overall diameter. The featureless central region appears evenly illuminated.

OBJECT #115	NGC 2867
Constellation	Carina
Right ascension	9h21m
Declination	−58°19′
Magnitude	9.7
Size	11″
Type	Planetary nebula
Other name	Caldwell 90

You'll find our next object 1.1° north-northeast of magnitude 2.2 Aspidiske (Iota [ι] Carinae). This bright planetary takes all the magnification you can throw at it. Through 4-inch and larger telescopes, it appears robin's-egg blue to most observers. A 12-inch scope at 300× reveals a bright edge with an ever-so-slightly darker central region. A magnitude 10.2 star lies a bit more than 2″ east of the nebula.

OBJECT #116	NGC 2899
Constellation	Vela
Right ascension	9h27m
Declination	–56°06′
Magnitude	11.8
Size	120″
Type	Planetary nebula

Our next object lies 1.3° south-southeast of magnitude 2.5 Kappa (κ) Velorum. Astronomers classify this object as a bipolar planetary nebula. What you'll see through a 12-inch telescope looks more like an evenly illuminated rectangle, 50% longer than it is wide. Its long axis stretches in an east-west direction.

When you're done observing NGC 2899, take a look at the large, magnitude 7.4 open cluster IC 2488. This object, dubbed the Hoopskirt Cluster or the String of Pearls Cluster, lies 0.9° to the south.

OBJECT #117	NGC 2903
Constellation	Leo
Right ascension	9h32m
Declination	21°30′
Magnitude	9.0
Size	12.0′ by 5.6′
Type	Spiral galaxy

Leo the Lion contains many fine galaxies, five of which (M65, M66, M95, M96, and M105) made Messier's list. Don't overlook NGC 2903, however, which shines brighter than any Messier galaxy except M66. German-born English astronomer William Herschel (1738–1822) discovered NGC 2903 in 1784. I have no idea why this bright, easily seen celestial wonder lacks a common name.

Astronomers classify NGC 2903 as a "hotspot" galaxy, a term coined in the 1950s that describes a ring of infrared-luminous knots near a galaxy's core. The knots are hot star clusters only 6–9 million years old.

Although NGC 2903 is a bright galaxy, you won't see much detail through a telescope with an aperture smaller than 10′. Through a 10-inch scope, look for a halo 4′ by 2′ that surrounds a bright core. Close examination at high magnification reveals the galaxy's central bar and the spiral arms, which aren't much brighter than its halo. Through larger scopes, look for dust lanes and emission nebulae spread throughout NGC 2903's spiral arms.

A second deep-sky object — NGC 2905 — appears as a bright knot within NGC 2903. NGC 2905 is a star-forming region, which Herschel assigned a second designation. It lies slightly more than 1′ north-northeast of NGC 2903's core.

OBJECT #118	NGC 2964
Constellation	Leo
Right ascension	9h43m
Declination	31°51′
Magnitude	11.2
Size	3′ by 1.7′
Type	Spiral galaxy

Our next target lies in far-northern Leo. Point your telescope 6.2° north-northwest of magnitude 3.9 Mu (μ) Leonis, or 1.9° north of the magnitude 5.6 star 15 Leonis. An 8-inch scope reveals an evenly illuminated oval. A 14-inch at 350× lets you see the ultra-thin outer halo, which is our clue to this object's spiral structure.

You won't see the tightly wound spiral arms through anything less than a 24-inch instrument, and even through such an instrument they will appear only as stubs. The magnitude 11.9 spiral galaxy NGC 2968 lies 6′ to the northeast. For a real challenge, magnitude 14.6 NGC 2970 lies 11′ northeast of NGC 2964.

OBJECT #119	NGC 2974
Constellation	Sextans
Right ascension	9h43m
Declination	–3°42′
Magnitude	10.9
Size	3.4′ by 2.1′
Type	Elliptical galaxy

This object lies 2.6° south-southeast of magnitude 3.9 Iota (ι) Hydrae. Probably the first thing you'll notice about NGC 2974 is the magnitude 9.4 star that sits less than 1′ southwest of the galaxy's core. It's a bit distracting. The galaxy has an oval shape and stretches 50% longer than it is wide in a northeast-to-southwest orientation. Through a 10-inch telescope at 250× or more, you can see the faint outer halo.

OBJECT #120	NGC 2976
Constellation	Ursa Major
Right ascension	9h47m
Declination	67°55′
Magnitude	10.2
Size	5.0′ by 2.8′
Type	Spiral galaxy

Our next target is a member of the M81 galaxy group, which lies approximately 12 million light-years away. NGC 2976 lies 1.4° south-southwest of M81, and 2.2° south-southeast of the magnitude 4.5 star 24 Ursae Majoris. Through an 8-inch telescope, the galaxy's oval shape stretches twice as long as it is wide in a northwest-to-southeast orientation. Larger instruments show a mottled appearance with many tiny dark regions within the galaxy's disk.

OBJECT #121	NGC 2985
Constellation	Ursa Major
Right ascension	9h50m
Declination	72°17′
Magnitude	10.4
Size	4.6′ by 3.4′
Type	Spiral galaxy

Look toward the northern part of the Great Bear for our next target, which lies 0.6° east of the magnitude 5.2 star 27 Ursae Majoris. The slightly oval shape is easy to see at magnifications above 150×. Through a 10-inch or larger telescope, you'll see the wide, faint outer halo. Look for the magnitude 11.5 spiral galaxy NGC 3027, which lies 0.4° east of NGC 2985.

OBJECT #122	NGC 2986
Constellation	Hydra
Right ascension	9h44m
Declination	–21°17′
Magnitude	10.7
Size	3.2′ by 2.6′
Type	Elliptical galaxy

This target lies 6.7° south-southwest of magnitude 4.1 Upsilon^1 (υ^1) Hydrae. No amateur telescope reveals vast detail in this object, but what you will see is an evenly illuminated central region that

spans more than three-quarters of the galaxy's total diameter. The thin outer halo is visible at high magnification through 10-inch and larger scopes. When you're through with NGC 2986, crank up the magnification and observe the magnitude 14.4 spiral PGC 27873, which lies 2′ west-southwest of NGC 2986.

OBJECT #123	NGC 2997
Constellation	Antlia
Right ascension	9h46m
Declination	–31°11′
Magnitude	9.3
Size	10.0′ by 6.3′
Type	Spiral galaxy

You'll find this target 3° east-northeast of magnitude 5.9 Zeta^2 (ζ^2) Antliae. A 10-inch telescope shows an oval haze elongated east-west with a bright core. Several broken, dark spaces that mark the regions between spiral arms surround the core. The faint halo looks like a slightly brighter ring around the central region.

OBJECT #124	Upsilon (υ) Carinae
Constellation	Carina
Right ascension	9h47m
Declination	–65°04′
Magnitudes	3.1/6.1
Separation	5″
Type	Double star

You'll have no trouble splitting this binary through even a 2.4-inch scope. Both components appear white.

Object #125 Bode's Galaxy (M81) Stefan Seip/Adam Block/NOAO/AURA/NSF

OBJECT #125	M81 (NGC 3031)
Constellation	Ursa Major
Right ascension	9h56m
Declination	69°04′
Magnitude	6.9
Size	24.0′ by 13.0′
Type	Spiral galaxy
Other name	Bode's Galaxy

In the northwest section of Ursa Major the Great Bear sits M81, one of the sky's brightest galaxies. You'll find it 2° east-southeast of the magnitude 4.5 star 24 Ursae Majoris.

German astronomer and celestial cartographer Johann Elert Bode (1747–1826) discovered this object, and nearby irregular galaxy M82, December 31, 1774. French astronomer Pierre Francois André Méchain (1744–1804) independently discovered both galaxies in August 1779 and reported them to Messier, who added them to his list.

Bode's Galaxy glows brightly enough to show up through binoculars, but the larger the telescope you can point at it, the better. Through an 8-inch scope, you'll see a large, bright central region surrounding the much brighter core. Through a 12-inch instrument, you'll detect how the spiral arms wind tightly around the core. The easternmost appears brighter. Unfortunately, you won't detect any dust lanes or star-forming regions through amateur scopes of any size.

M81 is the brightest member of the M81 Group, one of the closest galactic groups to our own Local Group (see Object #245). The M81 Group contains about a dozen galaxies and lies 12 million light-years away. Other members of this group include M82, NGC 2403, NGC 2366, and NGC 3077.

Object #126 The Cigar Galaxy (M82) Adam Block/NOAO/AURA/NSF

OBJECT #126	M82 (NGC 3034)
Constellation	Ursa Major
Right ascension	9h56m
Declination	69°41′
Magnitude	8.4

(continued)	
Size	12.0′ by 5.6′
Type	Starburst galaxy
Other name	The Cigar Galaxy

Point your telescope 37′ due south of Bode's Galaxy (M81), and you might think you're seeing a galaxy explode. Not exactly. What you've found is M82, the classic example of a starburst galaxy. Its core is a complex of star-forming regions that dwarfs our Milky Way's Orion Nebula.

M82's appearance is due to a close interaction with M81 between 500 million and 600 million years ago. Radio telescope maps show a great deal of gas surrounding both objects.

Amateur astronomers call M82 the Cigar Galaxy because of its appearance through a small telescope. It appears 4 times as long as wide, and its long axis orients east-southeast to west-northwest. The galaxy's brightest part lies east of center. Farther east, a dark lane cuts diagonally across M82's minor axis (the short dimension).

M82 has a greater surface brightness than most galaxies. To illustrate what this means, compare M82 to M81 in an eyepiece that just frames them both. Although M82 shines a magnitude and a half fainter than M81, it appears about as bright. Use high magnification to reveal its details, even on less-than-perfect nights. This technique doesn't work on low-surface-brightness galaxies like M101.

OBJECT #127	Sextans B
Constellation	Sextans
Right ascension	10h00m
Declination	5°20′
Magnitude	11.3
Size	5.5′ by 3.7′
Type	Irregular galaxy

Sextans B is a member of our Local Group. At 4.5 million light-years, it sits right at the outer edge of the small collection of galaxies that contains our Milky Way. Through a 12-inch telescope, you'll see a rectangular smudge of light dotted here and there by faint foreground stars. The central region, about one-third the galaxy's diameter, is ever-so-slightly brighter than the outer regions.

To find this galaxy, look 6° north-northwest of magnitude 4.5 Alpha (α) Sextantis.

By the way, the name "Sextans B" is an example of a radioastronomical name. Such a label combines a constellation's name and an uppercase letter. Letters start at A and descend in order of brightness in radio wavelengths for such galaxies within a constellation. Astronomers John G. Bolton and Gordon J. Stanley introduced this system around 1950.

OBJECT #128	NGC 3077
Constellation	Ursa Major
Right ascension	10h03m
Declination	68°44′
Magnitude	9.8
Size	5.5′ by 4.1′
Type	Irregular galaxy

This galaxy lies 0.8° east-southeast of Bode's Galaxy (M81) and 1.1° southeast of the Cigar Galaxy. If, therefore, your telescope/eyepiece combination gives a bit more than a 1° field of view, you'll see all three galaxies at once, albeit at low power.

This galaxy has a wide, bright nucleus. It's an oval with faint outer layers that I had no trouble seeing. I was expecting the often-described ray to be more of an extension to the northeast. What I have observed is short, thick, and quite faint.

NGC 3077 may be a satellite galaxy of M81. The two objects lie only 200,000 light-years away from each other.

Two 8th-magnitude stars lie near NGC 3077. One, less than 4′ away, lies in the direction of M82. The other, 10′ distant, lies just off a line that connects NGC 3077 with M81.

Object #129 NGC 3079 Jeff Hapeman/Adam Block/NOAO/AURA/NSF

OBJECT #129	NGC 3079
Constellation	Ursa Major
Right ascension	10h02m
Declination	55°41′
Magnitude	10.9
Size	8.0′ by 1.5′
Type	Barred spiral galaxy

You'll find this object 2.2° northeast of magnitude 4.6 Phi (ϕ) Ursae Majoris. Yet another of the sky's galactic "splinters," NGC 3079 appears five times as long as it is wide. Through a 12-inch telescope at 300×, you'll see that the bright central region stretches nearly two-thirds of the galaxy's total length. If your sky is ultra-steady, you may spot the thin extensions that mark the spiral arms.

A nice triangle of relatively bright stars lies near the galaxy's southern end. The brightest, magnitude 7.9 SAO 27476, lies 6′ south-southwest, magnitude 9.6 SAO 27482 sits less than 4′ southeast, and magnitude 9.5 SAO 27486 lies 7′ south-southeast. Finally, you'll find the magnitude 13.0 elliptical galaxy NGC 3073 only 10′ to the west-southwest of NGC 3079.

OBJECT #130	NGC 3109
Constellation	Hydra
Right ascension	10h03m
Declination	–26°09′
Magnitude	9.8
Size	16.0′ by 2.9′
Type	Barred spiral galaxy

This target lies 7.2° northwest of magnitude 4.3 Alpha (α) Antliae. This nearby barred spiral galaxy belongs to the Local Group. Through a 6-inch telescope, NGC 3109 appears as a faint mist measuring three to four times longer than it is wide, but you'll need to be under a really dark sky to see it through that aperture. A 16-inch scope, on the other hand, reveals a surface punctuated with knots of unresolved stars and clouds of ionized hydrogen.

OBJECT #131	NGC 3114
Constellation	Carina
Right ascension	10h03m
Declination	–60°07′
Magnitude	4.2
Size	35′
Type	Open cluster

Get ready for a glorious view. This terrific cluster lies within a spectacular star field. Specifically, you'll find it 5.8° east-southeast of magnitude 2.2 Aspidiske (Iota [ι] Carinae). Although NGC 3114 is visible without optical aid, scan the area with binoculars for the best view.

Through a 4-inch telescope, you'll first spot two bright stars in the cluster's area, magnitude 6.2 SAO 237640 and magnitude 7.3 SAO 237655. Surrounding this pair are dozens of similarly bright stars you'll form into a variety of patterns. Larger scopes add another layer of faint stars to the background.

While you're in the area, be sure to take a look at the magnitude 8.8 open cluster Trumpler 12. It lies 0.5° east-southeast of NGC 3114.

OBJECT #132	NGC 3115
Constellation	Sextans
Right ascension	10h05m
Declination	–7°43′

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Magnitude	8.9
Size	8.1′ by 2.8′
Type	Lenticular galaxy
Common names	The Spindle Galaxy, Caldwell 53

Not only is the Spindle Galaxy the showpiece of Sextans, it's one of the sky's brightest galaxies. In fact, observers can hardly believe Charles Messier failed to include it in his catalog. It is the prototype S0 galaxy, a class that American astronomer Edwin Hubble used to bridge the gap between the flattest ellipticals and spirals. Such objects have a large central bulge and long extensions (like the type of spindle that holds thread or yarn) but no spiral arms.

NGC 3115 is so bright that you can spot it through binoculars or a finder scope. Through a 4-inch telescope, you'll see an object four times as long as it is wide with a bright center. Through a 12-inch scope at 300×, the central bulge appears more distinct, an oval bulge surrounds the center, and a faint oval glow surrounds the entire object.

You'll find the Spindle Galaxy 3.2° east of magnitude 5.1 Gamma (γ) Sextantis.

OBJECT #133	Alpha (α) Leonis
Constellation	Leo
Right ascension	10h08m
Declination	11°58′
Magnitudes	1.3/8.1/13.5
Separation	177″ and 4.2″
Type	Double star
Other name	Regulus

This triple star features magnitude 1.3 Regulus A and the much fainter pair B–C. B shines at magnitude 8.1, and C glows faintly at magnitude 13.5. Stars B and C lie 4.2″ apart, and the A component lies 177″ away from them. I've seen all three components through a 10-inch telescope from a dark site.

OBJECT #134	NGC 3132
Constellation	Vela
Right ascension	10h08m
Declination	–40°26′
Magnitude	9.7
Size	30″
Type	Planetary nebula
Other names	The Eight Burst Nebula, the Southern Ring Nebula, Caldwell 74

Ten thousand years ago, a Sun-like star in the southern constellation Vela the Sails reached the end of its life and expelled its outer layers into space. What remained of the star's core shrank to the size of Earth, its surface heated up to 180,000°F (100,000°C), and it began emitting ultraviolet radiation. Scientists call such stellar corpses white dwarfs. The expanding shell of gas illuminated by the white dwarf's radiation formed a planetary nebula.

When you observe NGC 3132, you'll find an object about the same size and dimensions as the Ring Nebula (Object #567), and from this likeness comes one of the object's common names. NGC 3132's structure, however, is more complex. Several ovals appear superimposed and tilted at different angles. The nebula's outer boundary also looks more irregular, and the region around the central star contains more material than in the Ring Nebula's case.

NGC 3132 has a high surface brightness, so it responds well to high magnifications (in excess of 250×). A diffuse, irregularly bright inner shell surrounds the imposter central star. The brightest gaseous region forms the nebula's border.

Finally, the other common name for NGC 3132, the Eight-Burst Nebula (or Eight-Burst Planetary), comes from its complex structure as seen on photographs. That assessment comes from American astronomer Robert Burnham, Jr. (1931–1993) in *Burnham's Celestial Handbook: Volume Three, Pavo through Vulpecula* (Dover, 1978).

Object #135 NGC 3147 Alex and Mike Beck/Adam Block/NOAO/AURA/NSF

OBJECT #135	NGC 3147
Constellation	Draco
Right ascension	10h17m
Declination	73°24′
Magnitude	10.6
Size	4.3′ by 3.7′
Type	Spiral galaxy

Our next target is an attractive face-on spiral galaxy. NGC 3147 has a bright, small core surrounded by a circular haze. Although you won't see spiral structure directly, the aspect of the core and halo are telltale signs that this is a spiral galaxy. You'll find NGC 3147 slightly more than 7° northwest of magnitude 3.8 Lambda (λ) Draconis.

OBJECT #136	Leo I
Constellation	Leo
Right ascension	10h09m
Declination	12°18′
Magnitude	10.2
Size	12.0′ by 9.3′
Type	Dwarf spheroidal galaxy

Our next target is a personal favorite of mine. It demonstrates that a celestial object can be easy to find, but really difficult to observe details in. What makes it easy to find is its location: It lies only 20′ due north of magnitude 1.3 Regulus (Alpha [α] Leonis). But that brilliant star's glare through the eyepiece also makes Leo I difficult to see.

At a dark site, an 8-inch telescope at 150× reveals a faint mist that appears uniformly bright. Whatever you do, keep Regulus out of the field of view.

American astronomers Robert G. Harrington and Albert George Wilson discovered Leo I in 1950. They were searching photographic plates taken during the National Geographic Society Palomar Sky Survey using the 48-inch Samuel Oschin Schmidt Telescope.

Object #137 NGC 3169 (upper right) and NGC 3166 Adam Block/NOAO/AURA/NSF

OBJECT #137	NGC 3169
Constellation	Sextans
Right ascension	10h14m
Declination	3°28′
Magnitude	10.2
Size	5.0′ by 2.8′
Type	Spiral galaxy

Our next target is a two-in-one. It combines NGC 3169 with the magnitude 10.5 spiral NGC 3166, which lies only 8′ to the west-southwest. The pair forms a non-interacting quartet with two more spirals, magnitude 13.9 NGC 3165 and magnitude 12.1 NGC 3156.

Through an 8-inch telescope, NGC 3169 appears about twice as long as it is wide oriented northeast to southwest. The central region, also elongated, is much brighter than the halo.

Magnitude 10.5 NGC 3166 appears ever-so-slightly oval (4.8′ by 2.3′), stretched in an east-west direction. Its central region is wide, and its halo is thin.

OBJECT #138	NGC 3172
Constellation	Ursa Minor
Right ascension	11h47m
Declination	89°06′
Magnitude	13.8
Size	1.1′ by 0.8′
Type	Barred spiral galaxy
Other name	Polarissima Borealis

This next deep-sky object is a tough one: spiral galaxy NGC 3172 in Ursa Minor. Because it glows dimly at magnitude 13.6 (and some estimates put it fainter than magnitude 14) you'll need at least a 10-inch scope and a really dark sky to spot it.

But if you live north of the equator, you do have an advantage. You can search for NGC 3172 any night of the year. That's because it lies only 1.5° from Polaris (Alpha [α] Ursae Minoris) — the North Star. In fact, it's the closest NGC object to the North Celestial Pole — only 0.9° from that heavenly marker. Because of its extreme northern position that keeps it above the horizon for just about the whole Northern Hemisphere, astronomers have dubbed NGC 3172 Polarissima Borealis.

Visually, this isn't the Whirlpool Galaxy (M51). In fact, it's pretty uninteresting apart from its location. If you spot it, you'll see a faint oval haze about 0.5′ across with a slightly brighter center.

OBJECT #139	NGC 3175
Constellation	Antlia
Right ascension	10h15m
Declination	–28°52′
Magnitude	11.3
Size	5.0′ by 1.3′
Type	Spiral galaxy

This object lies 3.5° northwest of magnitude 4.3 Alpha (α) Antliae. The disk-shaped object appears three times as long as it is wide. Through telescopes smaller than those with a 14-inch aperture, all you'll see is a uniformly bright splinter. Above that size, look for an irregularly bright halo, especially at the galaxy's ends.

OBJECT #140	NGC 3183
Constellation	Draco
Right ascension	10h22m
Declination	74°11′
Magnitude	11.8
Size	2.3′ by 1.4′
Type	Spiral galaxy

You'll find our next target 7.2° northwest of magnitude 3.8 Lambda (λ) Draconis. Through a 10-inch telescope, it appears roughly twice as long as it is wide with an even illumination. Bigger scopes and higher powers don't reveal all that much more. Interestingly, a tight group of four 14th-magnitude stars lie within about 1′ of the northern edge.

OBJECT #141	NGC 3184
Constellation	Ursa Major
Right ascension	10h18m

(continued)	
Declination	41°25′
Magnitude	9.8
Size	7.8′ by 7.2′
Type	Spiral galaxy
Other name	The Little Pinwheel Galaxy

Oh my! What a gorgeous galaxy through a large telescope. This face-on spiral reminds me of another, similar object in Ursa Major — M101 (Object #351). And, as its common name implies, many observers see similarities between it and the Pinwheel Galaxy (Object #799). NGC 3184's spiral arms are wide, so you'll have to use high power — past 400× — to spot the dark regions that divide them from the galaxy's nucleus. The magnitude 11.6 foreground star (GSC 3004:998) looks like a supernova blowing its top at the north end of NGC 3184.

NGC 3184 sits at the Great Bear's border with Leo Minor. If you're star-hopping, start at magnitude 3.0 Mu (μ) Ursae Majoris, and move 0.8° west. Through a more modest scope, say one with a 6-inch aperture, you'll see a circular haze with a slightly brighter center.

OBJECT #142	NGC 3190
Constellation	Leo
Right ascension	10h18m
Declination	21°50′
Magnitude	11.2
Size	4.1′ by 1.6′
Type	Spiral galaxy
Other name	The Gamma Leonis Group

You'll find this nice galaxy, and three others, 2° north-northwest of magnitude 2.0 Algieba (Gamma [γ] Leonis). Known as Hickson 44, the group is the brightest in Canadian astronomer Paul Hickson's catalog of 100 compact galaxy groups. The most famous entry in his catalog is number 92, Stephan's Quintet (Object #710).

NGC 3190, the largest galaxy in Hickson 44, appears oval, three times as long as it is wide. Its central region is long and bright. Through a 12-inch telescope at 250×, you'll see the dust lane south of the nucleus. The lane is least apparent near the nucleus. It broadens in both directions as you look away from the center.

The brightest galaxy in Hickson 44 is our next object, NGC 3193. The magnitude 12.0 barred spiral NGC 3185 resides 11′ southwest of NGC 3190. Finally, the magnitude 12.9 spiral NGC 3187 sits 5′ to the west-northwest of NGC 3190. Even through a large telescope, you won't pull much detail out of either of these two objects.

OBJECT #143	NGC 3193
Constellation	Leo
Right ascension	10h18m
Declination	21°54′
Magnitude	10.8
Size	2′ by 2′
Type	Elliptical galaxy

The compact galaxy group Hickson 44, which I talked about with NGC 3190 (Object #142), also contains NGC 3193, which lies 6′ to the northeast of NGC 3190. Through an 8-inch telescope, you'll see that NGC 3193 contains a broad, evenly illuminated central region and a thin halo.

OBJECT #144	NGC 3195
Constellation	Chamaeleon
Right ascension	10h09m
Declination	–80°52′
Magnitude	11.6
Size	38″
Type	Planetary nebula
Other name	Caldwell 109

This high surface-brightness object lies 1.5° west-southwest of magnitude 4.5 Delta^2 (δ^2) Chamaeleontis. A 4-inch telescope at 100× will reveal this object as a slightly fat "star." Through a 10-inch scope, crank the power beyond 200×, and you'll have no problem seeing the planetary nature of NGC 3195. At this magnification, the planetary appears slightly stretched in a north-northeast to south-southwest orientation.

OBJECT #145	Sextans A
Constellation	Sextans
Right ascension	10h11m
Declination	–4°42′
Magnitude	11.5
Size	5.9′ by 4.9′
Type	Irregular galaxy

Our next target is a member of our Local Group of galaxies. At 4.3 million light-years away, it sits on the outskirts of this assembly. You'll find it 5° west-southwest of magnitude 5.2 Delta (δ) Sextantis.

Through an 8-inch or larger telescope this odd-looking galaxy appears square. If you use a 14-inch telescope to observe this object, use a magnification of 300× and a nebula filter, and try to spot the brightest feature, an HII region at the southeastern edge.

For a discussion of the name "Sextans A," see Sextans B (Object #127).

OBJECT #146	Sextans Dwarf
Constellation	Sextans
Right ascension	10h13m
Declination	–1°36′
Magnitude	12.0
Size	26.9′ by 5.9′
Type	Galaxy

You'll find this faint target 1.8° southeast of magnitude 4.5 Alpha (α) Sextantis. Astronomers discovered it in 1990 during a photographic survey. It lies only 320,000 light-years away, but it's so large that is has a surface brightness barely above that of the night sky. Through at least a 16-inch telescope, use your lowest-power eyepiece and slowly scan the area looking for a tiny increase in the background glow.

Object #147 NGC 3198 John Vickery and Jim Matthes/Adam Block/NOAO/AURA/NSF

OBJECT #147	NGC 3198
Constellation	Ursa Major
Right ascension	10h20m
Declination	45°33′
Magnitude	10.2
Size	8.5′ by 3.3′
Type	Spiral galaxy

Our next object lies 2.7° north of magnitude 3.5 Tania Borealis (Lambda [λ] Ursae Majoris). Through a 6-inch telescope, you'll see an irregularly illuminated oval that appears more than twice as long as it is wide oriented northeast to southwest. A 14-inch scope at 300× shows lots of detail. A small, bright central region lies within an irregular halo that looks like truncated spiral arms. Only 2′ north of the northeastern tip lies the magnitude 11.2 star GSC 3435:470.

OBJECT #148	NGC 3199
Constellation	Carina
Right ascension	10h17m
Declination	–57°55′
Size	20′ by 15′
Type	Emission nebula

Look for our next target 4.4° southeast of magnitude 3.5 Phi (ϕ) Velorum. Through most telescopes, this nebula looks like a large, thick crescent that opens toward the east. Use a nebula filter for the best view. Only the largest amateur instruments show some of the additional nebulosity that fills in a roughly circular shape. Near the crescent's center lies a Wolf-Rayet star (HD 89358), a massive, hot star that generates lots of ultraviolet radiation and an intense stellar wind. In this case, the Wolf-Rayet star is sculpting out the gas surrounding it.

OBJECT #149	NGC 3201
Constellation	Vela
Right ascension	10h18m
Declination	–46°25′
Magnitude	6.8
Size	18.2′
Type	Globular cluster
Other name	Caldwell 79

Our next target is one of the southern sky's great globular clusters. It lies 5.7° west-northwest of magnitude 2.7 Mu (μ) Velorum. From a true-dark site, a sharp-eyed observer has an even chance to spot this object without optical aid. And although you'll see it through binoculars or a finder scope, set up your telescope to marvel at this swarm of suns. You won't be disappointed.

Through a 4-inch telescope at 100×, many unresolvable stars fill the brilliant core. Crank up the power to view a few outlier stars. Through an 11-inch scope, you'll count more than 100 stars — a lot more. Also note a moderately dark but shallow V-shaped indentation that encroaches on the southern side.

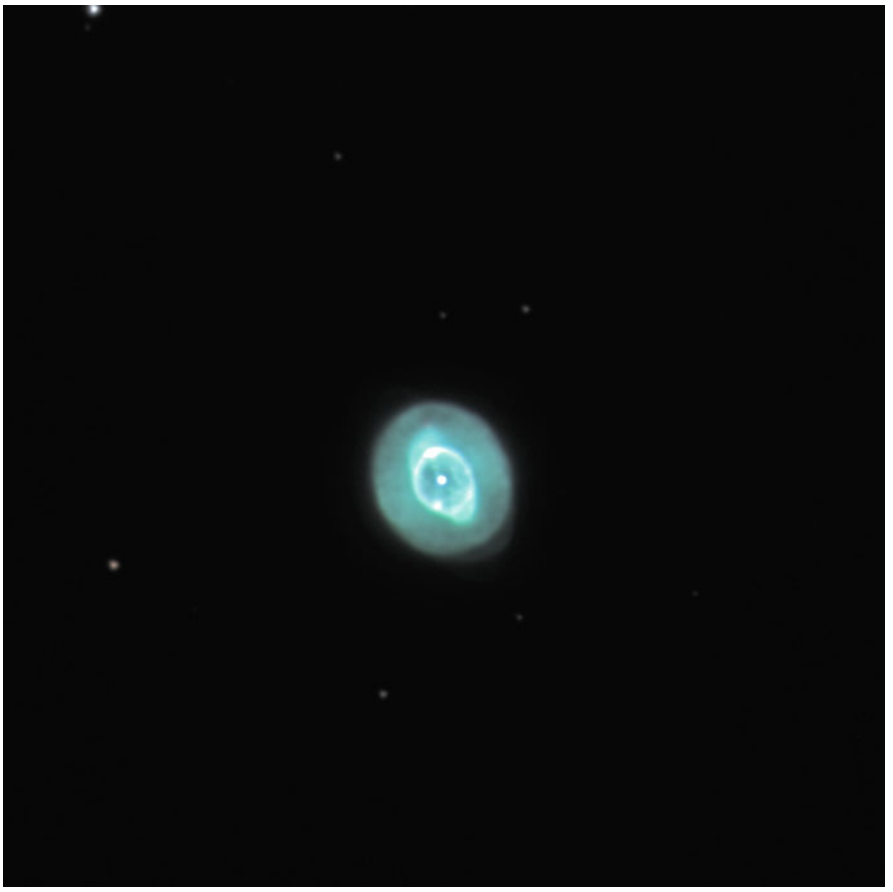
OBJECT #150	Gamma (γ) Leonis
Constellation	Leo
Right ascension	10h20m
Declination	19°50′
Magnitudes	2.3/3.5
Separation	4.4″
Type	Double star
Other name	Algieba

Algieba makes a nice sight through small telescopes. Both stars are yellow giants, so the difference between the two only depends on their brightnesses. The primary outshines the secondary by a factor of 3.

This star's name may come from the Arabic *al Jabbah*, meaning "the forehead." Al Jabbah was the 8th lunar mansion in ancient Arabia. Another possibility is that it originally comes from the Latin word *juba*, which means "lion's mane." "Algieba," therefore, would be an Arabicized version.

OBJECT #151	NGC 3227
Constellation	Leo
Right ascension	10h24m
Declination	19°52′
Magnitude	10.3
Size	6.9′ by 5.4′
Type	Spiral galaxy

You'll find this object, and its companion, the magnitude 11.4 elliptical galaxy NGC 3226, 50′ east of magnitude 2.0 Gamma (γ) Leonis. The elliptical appears to be attached to the northern end of the brighter galaxy. Through 6-inch and larger telescopes, NGC 3227 appears oval shaped with a long, concentrated central region. Its outer halo has an abrupt edge. NGC 3226 appears circular with a broad central region punctuated by a tiny, dim core.



Object #152 The Ghost of Jupiter (NGC 3242) Adam Block/NOAO/AURA/NSF

OBJECT #152	NGC 3242
Constellation	Hydra
Right ascension	10h25m
Declination	–18°38′
Magnitude	7.8
Size	16″
Type	Planetary nebula
Other names	The Ghost of Jupiter, the CBS Eye, Caldwell 59

In Hydra's east-central section, you'll find NGC 3242, the spring sky's showpiece planetary nebula. This object received its common name, "Ghost of Jupiter," from its planet-like appearance through small telescopes, although based on its color and brightness, it mostly resembles Uranus or Neptune. Sir William Herschel discovered NGC 3242 February 7, 1785.

At low magnification through a 6-inch telescope, you'll see the Ghost's softly glowing, pale, blue-green disk. Through larger scopes, and at powers in excess of 200×, the interior appears oval, like an eye or a football. The inner 10″ appears hollow, except for the dim central star. A faint spherical shell 40″ across encloses the "eye." Your best bet for observing the outer shell is to use a 12-inch or larger scope, an eyepiece that provides about 100×, and a nebula filter.

Much of the Ghost's blue-green color comes from oxygen atoms absorbing ultraviolet radiation from the central star and reradiating it as visible light. Because this emission is strong, an OIII filter works best for observing NGC 3242. "OIII" stands for "doubly ionized oxygen." Chemists use "III" to represent double ionization because they label neutral oxygen OI. Nebula filters such as OIII screw directly into the threaded barrels of 1 1/4″ or 2″ eyepieces.

OBJECT #153	IC 2574
Constellation	Ursa Major
Right ascension	10h28m
Declination	68°25′
Magnitude	10.4
Size	13.5′ by 8.3′
Type	Spiral galaxy
Other name	Coddington's Nebula

Although this object's popular name includes the word "nebula," it is, indeed, a galaxy. American astronomer Edwin Foster Coddington (1870–1950) discovered it April 17, 1898 while at Lick Observatory.

IC 2574 lies 5.7° west of magnitude 3.8 Lambda (λ) Draconis. Through an 8-inch telescope at 75×, it appears twice as long as it is wide oriented northeast to southwest. Because it's so huge, most of this galaxy has a low surface brightness. The central region glows a bit brighter, but seems offset to the southwest. In fact, most of the galaxy lies northeast of the wide core. Through a 12-inch or larger telescope, insert an eyepiece that magnifies 250× and a nebula filter, and view the star-forming region at the galaxy's northeastern tip.

OBJECT #154	NGC 3245
Constellation	Leo Minor
Right ascension	10h27m
Declination	28°31′
Magnitude	10.7
Size	3.2′ by 1.8′
Type	Spiral galaxy

Our next target lies 5.6° north-northeast of magnitude 3.4 Zeta (ζ) Leonis. Through an 8-inch telescope, this lens-shaped galaxy appears nearly twice as long as it is wide, with a north-south orientation. The broad, bright central region takes up most of the galaxy's area. At high powers, and through larger apertures, you might just spot the thin halo.

OBJECT #155	NGC 3310
Constellation	Ursa Major
Right ascension	10h39m
Declination	53°30′
Magnitude	10.6
Size	3.1′ by 2.4′
Type	Spiral galaxy

This object sits 4.4° southwest of magnitude 2.3 Merak (Beta [β] Ursae Majoris). Through an 8-inch telescope at 200×, this object appears slightly elongated in a north-northwest to south-southeast orientation. The galaxy's face has even illumination, except at the northern and southern ends, where you can detect the beginnings of wide spiral arms. Orange magnitude 5.6 SAO 27724 sits 10′ to the north-northeast. You'll want to keep it out of the field of view when you observe NGC 3310.

OBJECT #156	NGC 3311
Constellation	Hydra
Right ascension	10h37m
Declination	–27°32′
Magnitude	10.9
Size	4.0′ by 3.6′
Type	Spiral galaxy

Our next object, NGC 3311, is part of the Hydra I Galaxy Cluster. Look for it 4.1° north-northeast of magnitude 4.3 Alpha (α) Antliae. The Hydra I Galaxy Cluster lies three times as far away as the Virgo Cluster, which it resembles.

Through at least a 12-inch telescope, this small region of sky teems with faint galaxies. But before you notice those, you'll spot two stars, magnitude 4.9 SAO 179041 and magnitude 7.3 GSC 6641:1410. Around these stars, you'll spot NGC 3307, NGC 3308, NGC 3309, NGC 3311, NGC 3312, NGC 3314, and NGC 3316. NGC 3311 is the brightest, but it appears as just a circular haze with a bright center.

Magnitude 12.8 NGC 3312 lies 5′ east-southeast of NGC 3311 and is the most visually interesting, but you'll need at least a 16-inch telescope to resolve its spiral arms, arching to the north and south.

NGC 3309 is another large elliptical that appears to be in contact with the western edge of NGC 3311. It looks similar but a bit smaller than its neighbor.

OBJECT #157	x Velorum
Constellation	Vela
Right ascension	10h39m
Declination	–55°36′
Magnitudes	4.4/6.6
Separation	52″
Type	Double star

If you want to view a southern counterpart to Albireo (Beta [β] Cygni), this star is it. Either binoculars or a finder scope can split this binary, but a telescope/eyepiece combination that yields 50× seems ideal. The primary shines with a golden hue, and the secondary is blue.