Aquarius

Aqr
Aquarii

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Lying between the Great Square of Pegasus and the barren starfields of Capricornus and Piscis Austrinus, **Aquarius** the Water Bearer is sufficiently far away from the plane of the Milky Way that it contains relatively few galactic objects. The only notable members of the galaxy in the constellation are two bright planetary nebulae and several unusual stars and clusters. Aquarius is loaded, however, with faint galaxies, a few of which are impressive when viewed with backyard telescopes.

The most atypical deep-sky object in Aquarius is the sprawling **Helical Nebula** (NGC-7293). Also nicknamed the Helix, NGC-7293 is the largest and brightest planetary nebula in the sky, measuring some 769″ (nearly 13′) across and shining at photographic magnitude 6.5. The Helical Nebula is large and bright because it is relatively close, only about 150 parsecs away. (This is an average distance based on many widely discrepant figures.)

You might assume that the Helix, so named because its ring shape resembles a helical coil, would be an easy target even under slightly imperfect skies. This isn't the case, however. Its light is so spread out that individual parts of it appear dim and have a low contrast against the sky background.

To best observe the Helical Nebula, choose a night and time when the Moon is absent from the sky, the transparency is very good, and Aquarius is near its highest nightly elevation. Acquaint yourself with Aquarius and find the south-central part of the constellation; you'll see two 5th-magnitude stars catalogued as Upsilon (υ) and 57 Aquarii. The Helix lies between these stars, about a third of the way from Upsilon toward 57 Aqr.

When searching for the Helix use a low-power, wide-field eyepiece. A good nebular filter may help if your observing site is light polluted. If you have a 6-inch or larger scope you may see the nebula as a roundish patch of greenish gray light some 10′ across without any distinct features. If you can see it without difficulty, increase the magnification to something like 15x per inch of telescope aperture. A 10-incher at 150x shows the dark "hole" inside the nebula and subtle brightness variations along its edges, as well as several faint stars involved in the nebulosity. One of these stars, a 13th-magnitude bluish star at the dark hole's center, is the central star and is visible in 8-inch and larger scopes.

Another Aquarian planetary lies far to the north and is much smaller. With a photographic magnitude of 8.3 and a diameter of only 25″, the **Saturn Nebula** (NGC-7009) — so nicknamed because of ansae (projecting arms of nebulosity extending out on either side of the disk) — is small enough that its surface brightness is very high. It is relatively easy to find and observe with virtually any telescope.

The Saturn Nebula lies in the western end of Aquarius, about 2° west of the 4th-magnitude star Nu (ν) Aquarii. Sweep for this object using a magnification of about 10x per inch of aperture; the nebula's small angular size makes it inconspicuous at very low powers. When you find the Saturn Nebula you'll see a bright, bluish green oval of light surrounding a 12th-magnitude bluish central star. On a night of exceptional seeing, a good 10- or 12-inch telescope may show the ansae as faint projections of nebulosity spanning 44″ and ending in a bright condensation. If you see these delicate features, you'll be in a relatively select group of backyard observers who have seen such detail in a planetary nebula.

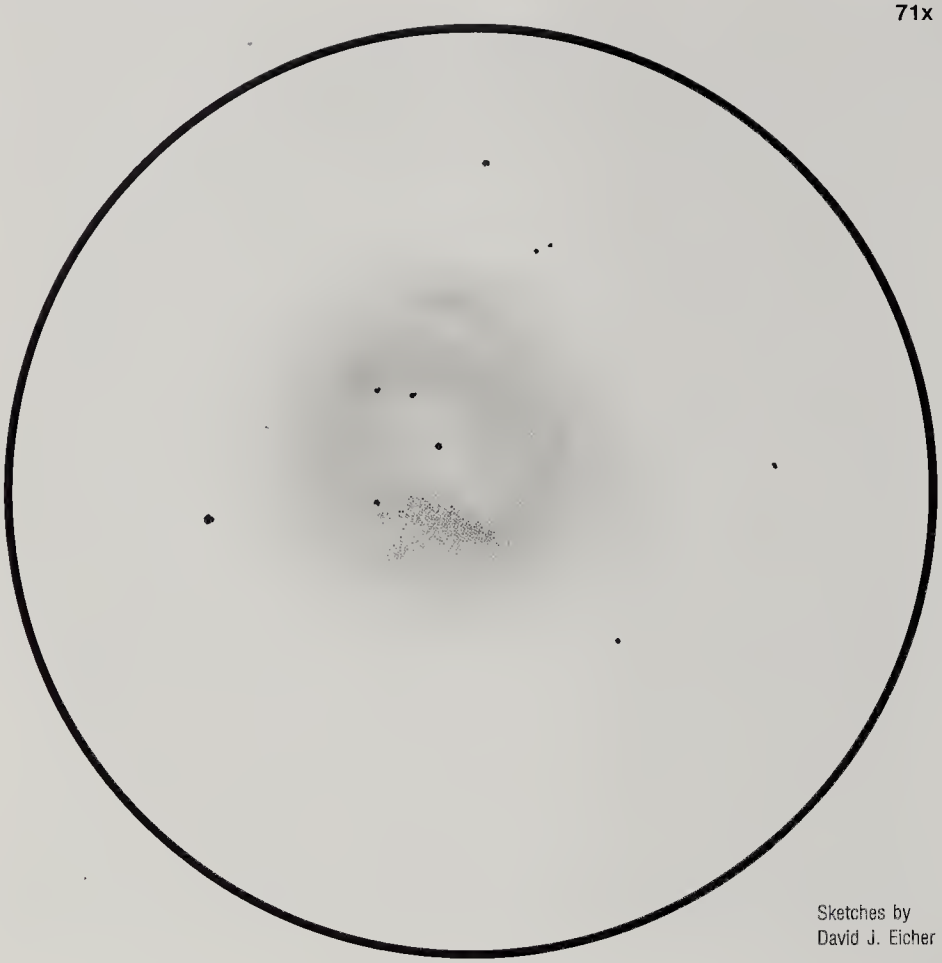
Some 2° southwest of the Saturn Nebula is a curious group of four stars that appear as a fuzzy smear of light in small finder scopes. This little asterism is Messier object **M-73** (NGC-6994). Charles Messier described it as "three or four small stars which look like a nebula at first sight; it contains a little nebulosity." Measuring 2.8′ across and glowing at photographic magnitude 8.9, it appeared to Messier to contain nebulosity when he observed the group in October 1780. Modern photographs show no nebulosity in the area, suggesting that Messier was simply mistaken. In fact the group is probably not a cluster but a chance alignment of stars lying at different distances. Although unspectacular in the eyepiece, M-73 is a curiosity of deep-sky cataloguing worth viewing at least once.

Only 1.5° west and slightly north of M-73 is the fine globular cluster **M-72** (NGC-6981). Shining at magnitude 9.4 and measuring nearly 6′ across, finder scopes show this object as a fuzzy, enlarged "star"; small telescopes at low power reveal a 4′-diameter disk without any resolution. But a 6- or 8-inch scope

BEST VISIBLE DURING
AUTUMN

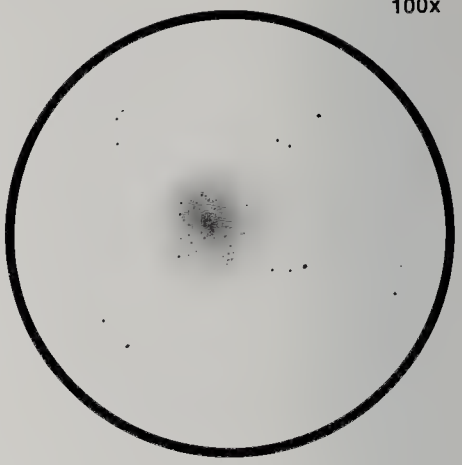
NGC-7293

17.5-inch
f/4.5 reflector
71x



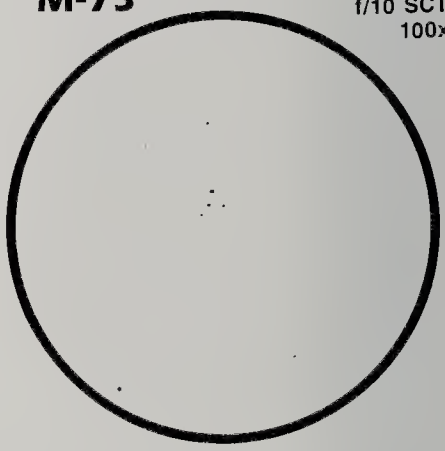
M-2

8-inch
f/10 SCT
100x



M-73

8-inch
f/10 SCT
100x



Sketches by
David J. Eicher

at high power in steady seeing will resolve stars along M-72's edges. Telescopes of 16-inches or more aperture show M-72 looking rather like M-13 as seen with a small scope.

Far more impressive is **M-2** (NGC-7089), a globular located 5° north of the bright double star Beta (β) Aquarii. This cluster is twice as large as M-72 and far brighter (magnitude 6.5), offering a satisfying view even in small scopes at low powers. M-2 is an obvious nonstellar blob of light in finder scopes and appears as an 8′-diameter disk in a 6-inch reflector at high power. On a dark night a 17.5-inch scope at 71x nicely resolves the cluster into myriad stars.

A third globular in Aquarius is **NGC-7492**, a large (6.2′ diameter) cluster composed of faint stars summing up to an integrated magnitude of 11.5. NGC-7492 lies 3.5° due east of the bright star Delta (δ) Aquarii and appears as a 4′-diameter pale gray disk in small scopes. Resolution of this cluster is difficult since the brightest giants in the cluster are quite faint. The largest backyard telescopes may resolve a few stars along the edges of this faint cluster on the very best of nights.

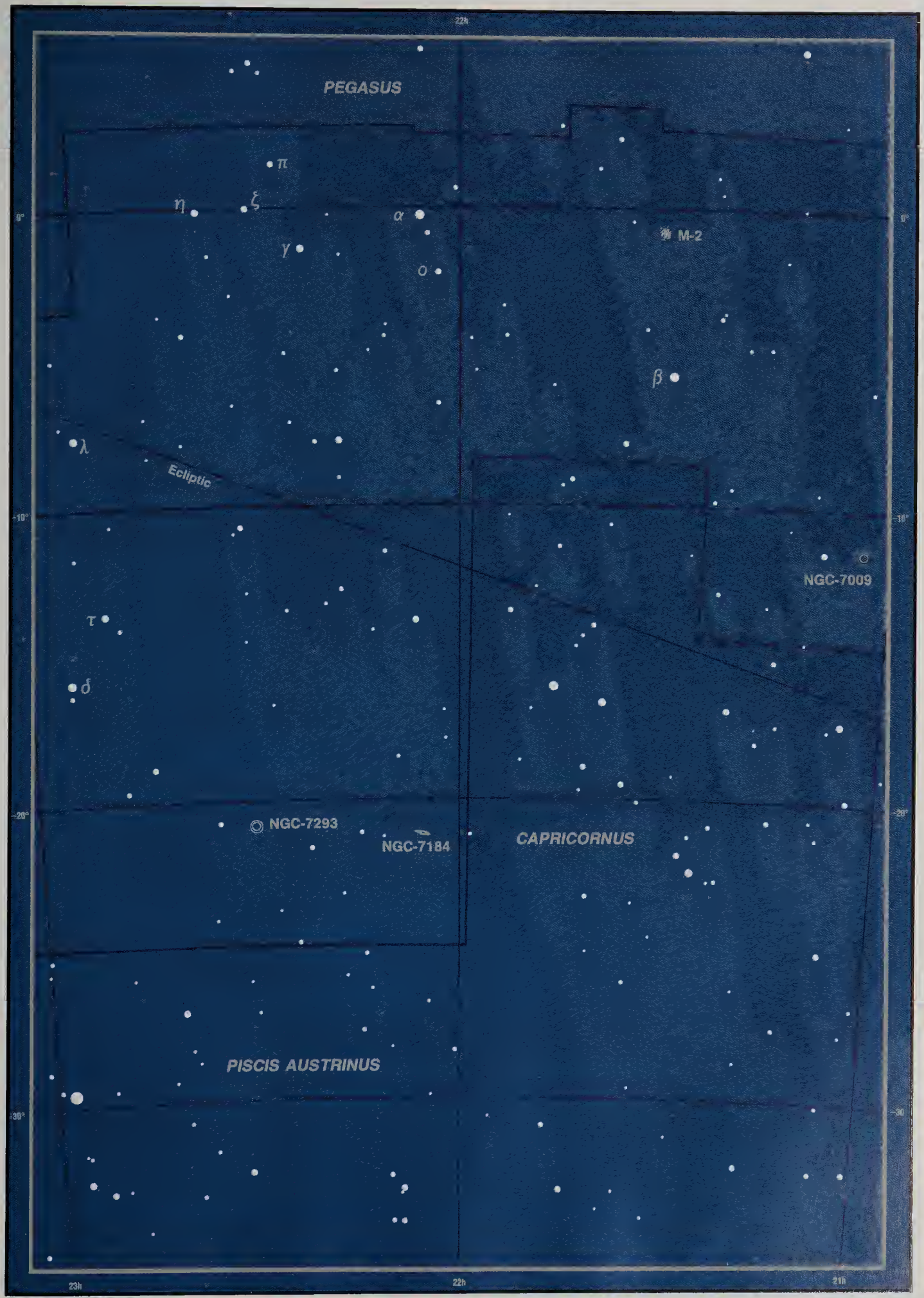
Aquarius contains a slew of galaxies but only a few of them are bright enough to show detail in backyard scopes. Lying a degree apart in the northeastern part of the constellation are **NGC-7723** and **NGC-7727**, two 11th-magnitude spirals. NGC-7723 is an Sb-type spiral measuring 3.6′ by 2.6′ across, and NGC-7727 is a barred spiral spanning 4.2′ by 3.4′. **NGC-7606** is another 11th-magnitude spiral; its spiral arms measure 5.8′ by 2.6′, and it contains a bright nucleus. **NGC-7184** is a large Sb-type spiral glowing at blue magnitude 12; with dimensions of 5.8′ by 1.8′ it appears as a silvery needle of light in small telescopes.

Object	M#	Type	R.A. (2000)	Dec.	Mag.	Size/Sep./Per.	H
NGC-6981	M-72	●	20h 53.5m	−12°32′	9.4	5.9′	
NGC-6994	M-73	::	20h 59.0m	−12°38′	8.9_P	2.8′	
NGC-7009		■	21h 04.2m	−11°22′	8.3_P	25″	
NGC-7089	M-2	●	21h 33.5m	− 0°49′	6.5	12.9′	
NGC-7184		§	22h 02.7m	−20°49′	12.0_B	5.8′x1.8′	Sb+
Zeta (ζ)		★²	22h 28.8m	− 0°07′	4.3, 4.5	1.5″	
NGC-7293		■	22h 29.6m	−20°49′	6.5_P	769″	
NGC-7492		●	23h 08.4m	−15°37′	11.5	6.2′	
NGC-7606		§	23h 19.1m	− 8°29′	10.8	5.8′ x 2.6′	Sb+
NGC-7723		§	23h 38.9m	−12°58′	11.1	3.6′ x 2.6′	Sb
NGC-7727		§	23h 39.9m	−12°18′	10.7	4.2′ x 3.4′	S(B)a pec
R		LPV	23h 43.8m	−15°17′	5.8↔12.4	387d	

H = Hubble type for galaxies

Subscript "P" denotes photographic magnitude; subscript "B" denotes blue magnitude.

★²	*Double Star*
LPV	*Long Period Variable*
::	*Asterism*
●	*Globular Star Cluster*
■	*Planetary Nebula*
§	*Spiral Galaxy*


22h
PEGASUS
π
η
ξ
α
γ
ο
M-2
β
λ
Ecliptic
0°
-10°
-20°
-30°
NGC-7009
τ
δ
NGC-7293
NGC-7184
CAPRICORNUS
PISCIS AUSTRINUS
23h
22h
21h