Aquarius, the Watering Can Man

by Magda Streicher

magda@pixie.co.za

Image source: Stellarium

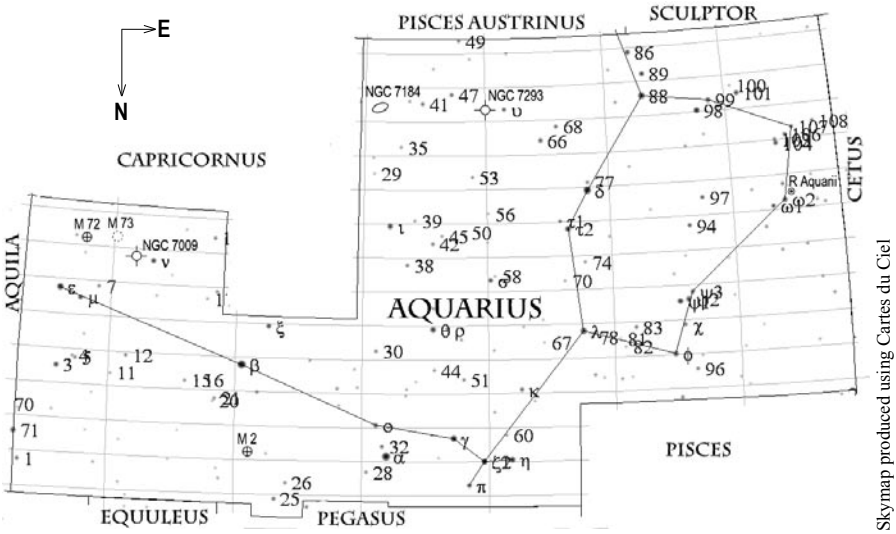
Aquarius is by no means just another constellation – it's quite simply something exceptional in its own right. Aquarius the water-bearer spreads out its lanky image just north of Capricornus the sea-goat. Other well-known water constellations are Piscis Austrinus the southern fish, Cetus the whale, Delphinus the dolphin and Hydra the water snake. The water-bearer was so named due to the Sun's entry into the constellation during the Babylonian monsoon season. The image portrays a man pouring water from a pitcher he's holding in his right hand. Little sprays of brighter stars look like numerous drops of water and stand out well against the fainter background star-field. When Aquarius is about appear in the east, Albali, or Epsilon Aquarii, at magnitude 3.7, pops up as the western-most star in the constellation, as if to say "Here I am!"

The first three objects, approximately three degrees south of Epsilon Aquarii, can be seen snugly tucked in behind Aquarius's ears, so to speak.

NGC 6981 (M 72) is the faintest Messier globular cluster and may be as far as 53 000 light years away. It was discovered on the night of 29/30 August 1780 by Pierre Mechain, the young rival of Charles Messier, the French astronomer. Averted vision yields the best view, which sees the object brightening relatively quickly to a core that appears slightly more square than round and less concentrated than most globulars. Not at all easy to resolve, although I can pick up a grainy tangerine skin impression, which makes me suspect partial resolution.

Just 1.2 degrees to the east, arguably one of the most interesting documented clusters or star asterisms can be seen. **NGC 6994**, better known as Messier 73, consists of a cluster of only four stars, which the University of Padua in Italy places at different distances as field stars. The 10.3 magnitude star (GSC 5778802) is the southernmost and brightest member of the four, which form a clear Y-shape. These four stars never cease to amaze me because of their sheer beauty.

The planetary nebula **NGC 7009** (Bennett 126), 1.8 degrees northeast of M73, was discovered by William Herschel in September 1782. Also known as the Saturn Nebula, it reminds me of an alien ship approaching us like a whisper in the dark of night. My notes



on several occasions indicate the Saturn Nebula as one of the most breathtaking planetary nebulae, a soft turquoise in colour. It is easily seen, relatively large and increasing in brightness towards its centre with the 12.7 magnitude central star visible only with high power. The spreading out of the two thin prominent extended rays on the west, southwest and east, northeastern sides is probably a ring being viewed edge on. It was named the Saturn Nebula by Lord Rosse in 1850 when the extensions projecting from its centre reminded him of the planet Saturn.

Globular clusters are unique. One outstanding example is **NGC 7089**, also known as Messier 2 (Bennett 127). NGC 7089 forms a triangle towards the southwest with 2.8 magnitude beta Aquarii (Sadalsuud) and 2.9 magnitude alpha Aquarii, (Sadalmelil). It is just visible with the naked eye under truly dark skies. Through the 12-inch telescope NGC 7089 displays a large round swarm of flickering lights in their thousands, working up to a broad, soft, dense core in a subtle envelope. With higher power the globular appears to explode into faint splinter stars. With care, even dark lanes became real. My attention was held by a small, roundish, dark patch between the outer halo at the SE edge that slightly extends to the NW where it nestles between faint stars. This heavenly jewel is almost 13 billion years old.

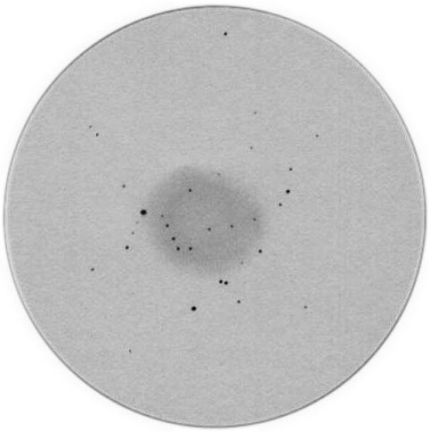
Zeta Aquarii is the lovely double-star, with manitude 4.3 and 4.5 components, separated only 2.1″ at position angle 192 and having a rotation period of nearly 856 years. The star is situated in the centre of the water jar, towards the northern part of the constellation. One can follow the sprinkled water droplet stars (my ever fertile imagination) that flow down from Eta Aquarii just 2′ east of the star Zeta Aquarii.

At first sight, the constellations appear to be static and unchanging. Year after year there is no apparent change in this constellation's appearance; indeed the Water Man looks the same now as he did to our grandparents. Yet at least twice a year the constellation of Aquarius literally comes alive with activity as meteors burst from its borders. It's almost as though the water literally spills and splashes. Aquarius is home to two major meteor showers, emanating from different comets, mirrored in the differing characters of the resulting meteors.

The Eta Aquarids peak in early May every year and are fast meteors (entering Earth's atmosphere at 66 km/s), rich in bright yellow meteors, the brighter members often leaving persistent trains. Alas, the sometimes spectacular Eta Aquarids can be observed only in the two hours before dawn after the radiant rises in the east. Imagine the added activity to the splashing water. The Eta Aquarids are the remnants of comet 1P Halley. At the age of 20 the young astronomer Edmond Halley sailed to the island of St Helena off the west coast of Africa to observe the southern stars.

The Aquarid complex of late July and early August comprises the Delta and Iota Aquarids, both of which are split into northern and southern branches and are probably remnants of comet 96P Machholz. Iota Aquarids are the less active of the July/ August streams. The Delta Aquarids (entering Earth's atmosphere at 40km/s) show a higher proportion of fainter, white meteors. Dedicated meteor watchers can observe the Delta and Iota Aquarids from about 22h00. If you do, you'll see that Aquarius is not the quiet spot in the sky that it first appears to be, according to Tim Cooper, our Comet and Meteor Director, whom I gratefully acknowledge for this info.

Aquarius is home to a number of galaxies, most of which are fairly faint. I thought one of the easiest to observe would be **NGC 7184**, situated 7.5 degrees south of Iota Aquarii, 13 degrees SW of Delta Aquarii. The galaxy is easy to see at 95x magnification. With higher power it will show off its spindle-shape with a suggestion of a concentrated brightness towards the small nucleus. It's a lovely edge-on galaxy with the NW edge thinner than the slightly rounder SE end. What first got my attention was a string of four faint stars swinging out to the NW, extended from a perfect golf putter impression caused by the galaxy. A good example of where the stars in the field add to a unique impression. Three



Planetary nebula NGC 7293, the well known Helix Nebula, sketched by Magda. North is up an west to the left.

more galaxies (NGC 7180, NGC 7185 and NGC 7188) can be seen strung away 20′ to the south of NGC 7184.

Just 2.2 degrees west of Delta Aquarii the constellation is home to a Mira type star. **R Aquarii** varies with a 386-day period between magnitude 5.8 and 12.4 and shines with a dull orange colour. This binary system contains a white dwarf star, receiving material from a red giant M5-8 star. Cederblad 211, an extremely faint nebula, surrounds the star but cannot usually be seen in amateur telescopes.

Our grand finale could be nothing else but **NGC 7293** (Bennett 129), the great Helix planetary nebula in the southwestern corner of the Aquarius constellation. At a distance of 450 light years it is one of our closest planetary nebulae. This double-ring nebula is nicely explained by an astronomy friend, Sue French, who sees it as looking down at two spring coils. I can only try to bring this wonderful object to your mind's eye – extremely large, this planetary nebula appears as a very faint, ghostly glow in a roundish annular ring shape, best seen using low power. With careful observation one can see the expanding light fading and becoming slightly darker towards the middle section. With higher power the very hot, white central 13-magnitude dwarf star and a few other faint stars became evident on a dusty surface. The NNE and SSW peripheries of the Helix are relatively well defined and brighter, with an outstanding close visual double star rounding off the SE edge. A nebula filter and dark skies will bring this elusive object to your gazing eyes.

Aquarius also holds a piece of history. The planet Neptune was predicted to exist by John C Adams, a young mathematican, and Jean J Le Verrier, a junior astronomer of the Paris Observatory. JG Galle of Berlin Observatory actually found and confirmed such a planet on 23 September 1846. Neptune was in Aquarius at the time. Incidentally, Neptune has almost completed one full orbit since its discovery. On 11 January 2012 it will revisit the spot where it was discovered 165 years earlier. Neptune's motion had been detected by Galileo as early as January 1613, but he did not realise that he was seeing a new planet.

As the Watering Can Man gladly shares his watery secrets, how about you sharing your observations with us? ☆

Object	Type	RA (J2000.0)	Dec	Mag	Size
NGC 6981 (M 72)	Globular	$20^h53.5^m$	-12º32′	9.3	5.9′
NGC 6994 (M 73)	Open Cluster	20 59.0	-12 38	8.9	2.8′
NGC 7009 (Saturn Neb)	P/Nebula	21 04.2	-11 22	8.3	25"
NGC 7089 (M 2)	Globular	21 33.5	-00 49	6.4	12.9′
NGC 7184	Galaxy	22 02.7	-20 49	11.2	6.5′ x 1.4′
Zeta Aquarii	Double Star	22 28.0	-00 01	4.3 & 4.5	Sep. 2.1"
NGC 7293 (Helix Neb)	P/Nebula	22 29.6	-20 48	7.3	12.8′
R Aquarii	Mira Var.	23 43.8	-15 17	5.8-12.4	Per 386.9d