MONTHLY OBSERVER'S CHALLENGE

Las Vegas Astronomical Society

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&

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Introduction

The purpose of the observer's challenge is to encourage the pursuit of visual observing. It is open to everyone that is interested, and if you are able to contribute notes, drawings, or photographs, we will be happy to include them in our monthly summary. Observing is not only a pleasure, but an art. With the main focus of amateur astronomy on astrophotography, many times people tend to forget how it was in the days before cameras, clock drives, and GOTO. Astronomy depended on what was seen through the eyepiece. Not only did it satisfy an innate curiosity, but it allowed the first astronomers to discover the beauty and the wonderment of the night sky.

Before photography, all observations depended on what the astronomer saw in the eyepiece, and how they recorded their observations. This was done through notes and drawings and that is the tradition we are stressing in the observers challenge. By combining our visual observations with our drawings, and sometimes, astrophotography (from those with the equipment and talent to do so), we get a unique understanding of what it is like to look through an eyepiece, and to see what is really there. The hope is that you will read through these notes and become inspired to take more time at the eyepiece studying each object, and looking for those subtle details that you might never have noticed before. Each new discovery increases one's appreciation of the skies above us. It is our firm belief that careful observing can improve your visual acuity to a much higher level that just might allow you to add inches to your telescope. Please consider this at your next observing session, as you can learn to make details jump out. It is also a thrill to point out details a new observer wouldn't even know to look for in that very faint galaxy, star cluster, nebula, or planet.

MESSIER 40 (M40)/NGC 4284/4290 – Galaxy Pair In Ursa Major

This very interesting and contrasting pair of galaxies lies very close to what some consider a mistake in the Messier catalog. The double star known as M40 is easily within the same field of view. In fact, all three objects form an almost straight line with the double star first on the east side, then the brighter galaxy, NGC 4290 which shines at mag. 12.7 followed by NGC 4284 which glows at a much dimmer mag. 14.3.

Both galaxies were catalogued if not discovered by William Herschel and bear his catalog numbers. NGC 4284 has the Herschel number H-798-3 while NGC 4290 carries H-805-2.

NGC 4284 is a highly inclined (tilted) spiral with a bright core and two spiral arms. It's approximately 190 million light-years away. Whereas NGC 4290 is a barred spiral, a bit less tilted than its partner and carries much more detail. It's approximately 140 million light-years away.

This pair makes a great challenge for any size scope though it will take the larger ones to see NGC 4284 unless the skies are superb.

Observations/Drawings/Photos (Contributors listed in alphabetical order)

Gary Bruno: LVAS Member from Las Vegas

On June 20,2014 at 23:00, I viewed NGC 4290 and M40 using various eyepieces in both a 10-inch reverse binocular and a 4-inch refractor. The best view came with a 16mm EP in the 4-inch refractor. I love to watch the galaxies do their little dance.

Sue French: LVAS Friend from New York

M40 is a double star near Megrez (Delta Ursae Majoris). Oddly, M40 was once considered a non-existent Messier object. In his 1784 catalogue, Charles Messier described his 40th object as: "Two stars very close to one another and very small, placed at the root of the great Bear's tail." Precessing Messier's coordinates to equinox 2000 takes us right to such a star pair. Messier noted this double while searching for a "nebulous star" reported by Johannes Hevelius. Messier assumed that Hevelius mistook these two stars for a nebula, but the latter was actually referring to a different pair of stars – also without nebulosity.

To locate M40, start at Megrez and hop 1.1º northeast to mag. 5.5 70 Ursae Majoris. Continue that line for 1/4º to arrive at M40. My 4.1-inch scope at 28X reveals an east-west pair of mag. 10 stars, with the western one slightly brighter. Through my 10-inch scope, I see the primary as yellow-orange and its companion as yellow-white. Two galaxies share the field at 118X. NGC 4290 is a small northeast-southwest oval, and NGC 4284 is a tiny faint spot forming a 1½' triangle with two mag. 13 stars. The galaxies are about 140 and 190 million light-years away. Although the distances to its stars are poorly known, M40 is probably an optical (unrelated) pair.

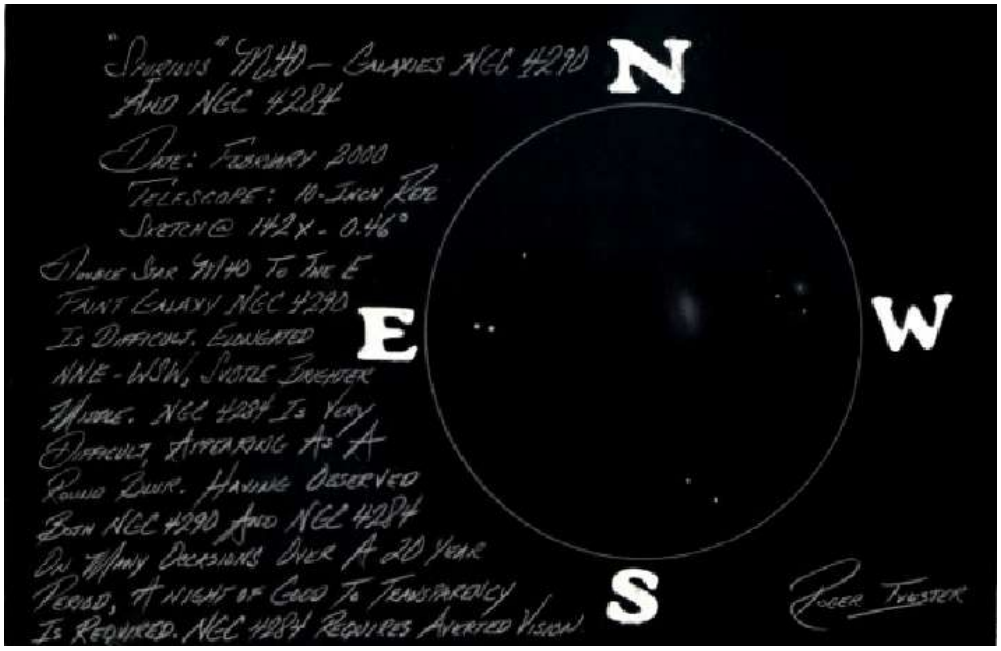
Independently discovered in 1863 by the German astronomer Friedrich August Theodor Winnecke, M40 carries the double-star designation Winnecke 4. Winnecke is also the original discoverer of eight NGC objects, and ten comets that bear his name.

Roger Ivester: LVAS Member from North Carolina

Due to our recent bad skies, I was unable to make a new observation of M40, and galaxies NGC 4284 and NGC 4290. I was forced to use a sketch and notes from an early morning observation on February 25, 2000. On that night, I was using a 10-inch reflector from my moderately light-polluted backyard with a 5.8 NELM. It was an especially good night with excellent transparency.

M40, a pair of mag. 10 stars, also known as Winnecke 4, was very easy with a wide separation of about 50 seconds of arc. The pair was oriented mostly east-west and both appeared as whitish-yellow in color.

Two faint galaxies were located very close to M40. All three objects were located within a 1/2º field-of-view.



Just to the west of M40, lay faint galaxy NGC 4290 at mag. 12.0, elongated NNE-WSW. I saw a very subtle brightness in the central region. Very close and to the west of it was a very faint mag. 14 galaxy, NGC 4284, which was extremely difficult, appearing as a faint, mostly round blur. During a previous observation from the same location and in a side-by-side comparison with the 10-inch reflector, we couldn't see NGC 4284 with an 8-inch Schmidt-Cassegrain telescope.

The pencil sketch was made using various graphite pencils and a blank 5 X 8 notecard with the colors inverted using a scanner.

Gus Johnson: Observer from Maryland

June 1979: Using an 8-inch reflector @ 94X, NGC 4290 was very dim, elongated NNW-WSW. In May of 1993, using 12 X 50 binoculars, I could see double star M40, but without a visible separation, however, I could determine that it was not a single star. It was easy to see using a small reflector with an effective aperture of 77mm.

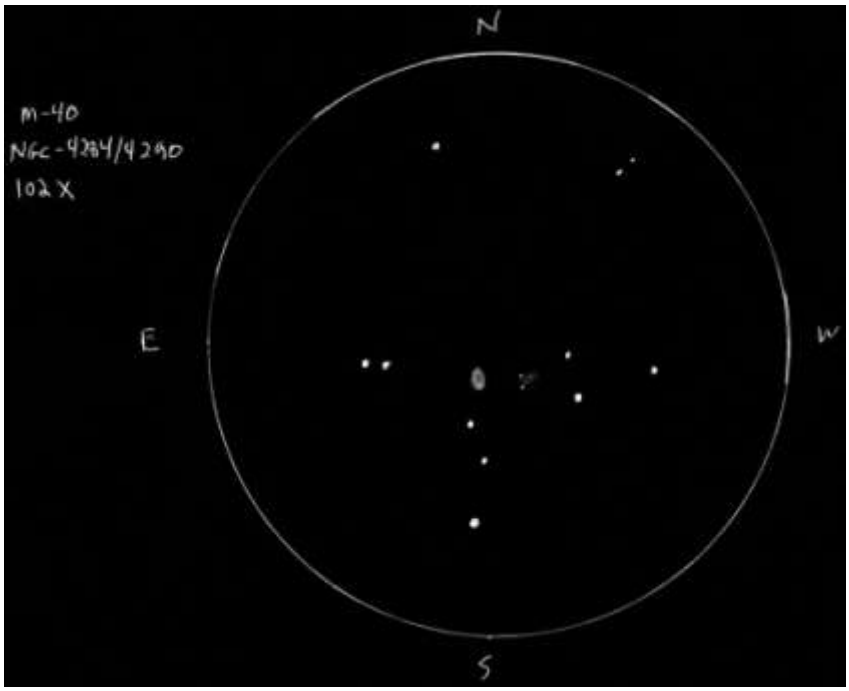
NOTE: Gus Johnson has been observing the night sky since the mid-50s, starting with a 3.5-inch reflector. In 1979, he was only the third amateur to visually discover a supernova in M100, identified as 1979C.

Fred Rayworth: LVAS Vice President and AL Coordinator from Las Vegas

I've observed NGC 4290 several times without noticing the fainter companion NGC 4284. It wasn't until May 15,2010, that I observed them together (not quite, read on…). On that date, I was at my favorite site at Redstone Picnic Area on the North Shore Road in the Lake Mead Recreational Park. At an altitude of 2,100 feet, it was calm and warm. I never had to put on a long-sleeved shirt all night. I was worried about the high, thin clouds going over, but they seemed to dissipate after dark and it was one of the best nights we've had all year (2010). There was no wind to speak of.

NGC 4284 was a faint, small oval. At the time I was trying out an extremely expensive high-end eyepiece of a brand I refuse to name, and even with it, the view was not impressive. It's funny that on that date, I never recorded the observation for NGC 4290, so there's a likely possibility that observation was actually NGC 4290 and not 4284. My subsequent observations show they match the brighter galaxy. Oh well…

I finally nailed it Saturday, June 28th, 2014 from our Las Vegas Astronomical Society observatory site at Mt. Potosi. With an elevation of 5,890 feet, it sits southwest of the Las Vegas Valley and presents fairly dark skies to the northwest, west and southwest. However, that night, though clear and only with a mild to no breeze, the transparency was not good and the sky was quite bright. There seemed to be dark holes where certain faint objects popped through, but overall, I couldn't pull out galaxies in the mag. 12.5 range without difficulty.

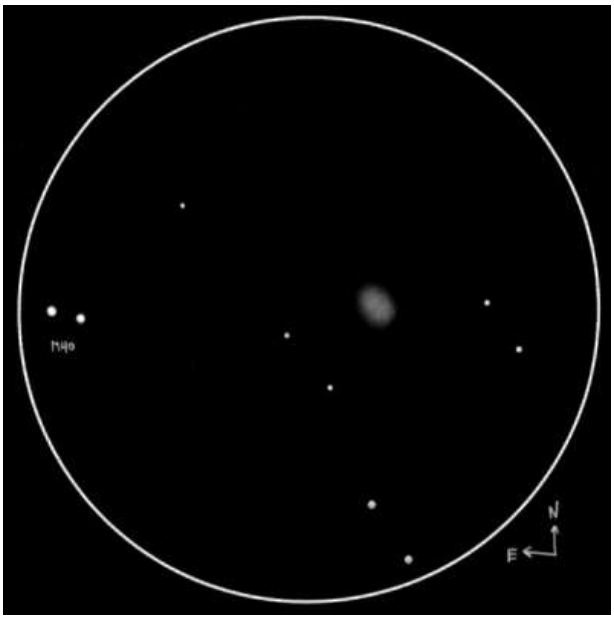


However… since I knew exactly where to look and used a lot of patience, I nailed this Challenge object and verified the *pair* for the first time.

I had to go back to the objects several times because the first time, I couldn't even see the brighter NGC 4290. I found the star pattern with M40, followed the line and couldn't see a thing. I came back a half hour later and there it was, a soft round glow. I then followed the line a little further to the two very faint stars that represent where NGC 4284 is, sandwiched between, and the first time, no luck. I came back another half hour later, and with averted vision and much patient sweeping, I finally detected just the hint of a smudge. Wow! What an effort. I had to pull my eye away, go back and pull away several times to make sure it wasn't "averted imagination." With the sky background being so bright, that little smudge blended right in and it took quite an effort to tell the very subtle difference. I did, finally, and detected just a slight oval shape nestled between those two faint stars and leading to the west (right in the eyepiece). I tried 131X and 229X, but neither magnification helped much. In the drawing you can barely see it, but that's probably a bit brighter than what I actually saw. Yeah, it was *that* faint. I'd like to see this on a truly dark night and check the difference.

Jaakko Saloranta: LVAS Friend from Finland

Here's all I've got: With a 4.5-inch reflector @ 152X (20'), the galaxy appeared as a fairly faint, NE-SW elongated galaxy, without detail, close to double star M40. NGC 4284 was invisible. Altitude of the object was 74°.



Jay Thompson: LVAS Member from Nevada

I observed NGC 4290 with the 17.5-inch from Meadview, AZ on January 3, 2014. At 125X and using an observing hood, the galaxy appeared as an oval soft glow, preceded by the fainter NGC 4284. Two stars are between NGC 4290 and NGC 4284. This was not an ideal night with thin clouds possibly dimming the galaxies and reducing contrast. I couldn't see the dim galaxy following NGC 4290. I didn't really expect to, since it appears very much fainter on photographs, and isn't labeled on the TriAtlas Chart C71 (Editor's note: the galaxy is on Megastar, is labeled MCG +10-18-32 and is a very dim mag. 17.0).

On June 6, 2014 I attempted to image NGC 4290 from Henderson, NV with a 14-inch SCT. There was considerable glare from the first quarter moon, but in a 130-second exposure, I was able to capture a dim streak for NGC 4290 as well as the faint stellar core for NGC 4284. North is up in the image. A longer exposure time, cooler ambient temperature, and moonless skies are needed to properly image the pair.