MONTHLY OBSERVER'S CHALLENGE

Compiled by:

Roger Ivester, North Carolina

&

Sue French, New York

July 2020

Report #137

Galaxy NGC 5689 (and optional galaxy NGC 5676) in Boötes

Sharing Observations and Bringing Amateur Astronomers Together

Introduction

The purpose of the Observer's Challenge is to encourage the pursuit of visual observing. It's open to everyone who's interested, and if you're able to contribute notes, and/or drawings, we'll be happy to include them in our monthly summary. Visual astronomy depends on what's seen through the eyepiece. Not only does it satisfy an innate curiosity, but it allows the visual observer to discover the beauty and the wonderment of the night sky. Before photography, all observations depended on what astronomers saw in the eyepiece, and how they recorded their observations. This was done through notes and drawings, and that's the tradition we're stressing in the Observer's Challenge. And for folks with an interest in astrophotography, your digital images and notes are just as welcome. The hope is that you'll read through these reports and become inspired to take more time at the eyepiece, study each object, and look for those subtle details that you might never have noticed before.

This month's target

The barred spiral galaxy NGC 5689 dwells in the northern reaches of Boötes, the Herdsman. In a 2015 journal paper, Korean astronomer Hong Bae Ann and colleagues derived the galaxy's distance from its radial velocity relative to the Local Group, using a Hubble constant of 75 km/sec/Mpc. Correcting their distance using the Hubble constant now favored by the NASA/IPAC Extragalactic Database (67.8 km/sec/Mpc) converts it to 99 million light-years.

William Herschel discovered NGC 5689 in 1787. His hand-written journal reads, "Pretty bright or considerably bright. A little elongated in the direction of the parallel, about 1½′ long. Much brighter in the middle." Three nights later, he described it as having faint branches.

Uwe Glahn: Observer from Germany

Object: NGC 5689
Telescope: 27″ f/4.2 Newton. Magnification: 293× – 488×
NELM: 6m5+, Seeing: III
Location: Sudelfeld

Object: NGC 5676
Telescope: 27″ f/4.2 Newton. Magnification: 419×
NELM: 6.5+, Seeing: III
Location: Sudelfeld

Rony De Laet: Observer from Belgium

Telescope: 16 inch f/4.5 truss Dobson

These are the first objects that I studied with my 16-inch truss Dobson. I had never observed them before.

Due to my Bortle 5 sky I don't get satisfying low power views of deep-sky objects. My best views are at powers of 150× and above. I was not even trying to fit both galaxies in the same high power eyepiece.

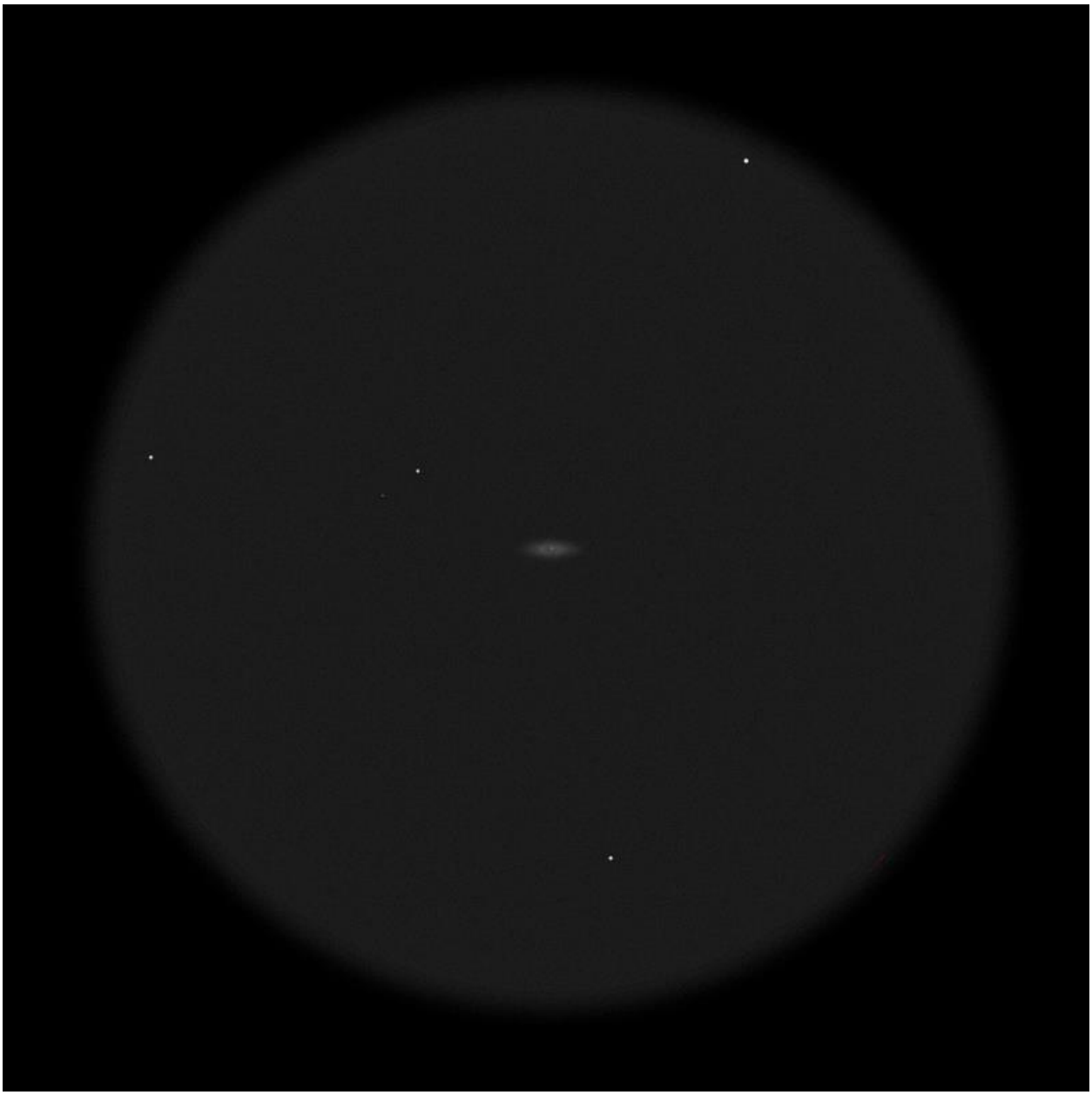
NGC 5676 is the more detailed of the two. A starlike nucleus is embedded in a bar-shaped core. The NE part of the core seems to extend into a short spiral arm. The halo of this galaxy extends more to the SW. Within the SE edge of the halo, I could detect a small trace of another spiral arm.

NGC 5689 appears much smaller. A stellar nucleus is centered in an oval, donut-shaped core. This could be an illusion due to the difference in brightness between the nucleus an the core. The E side of the oval donut seems a little brighter than the W side. The halo is elongated.

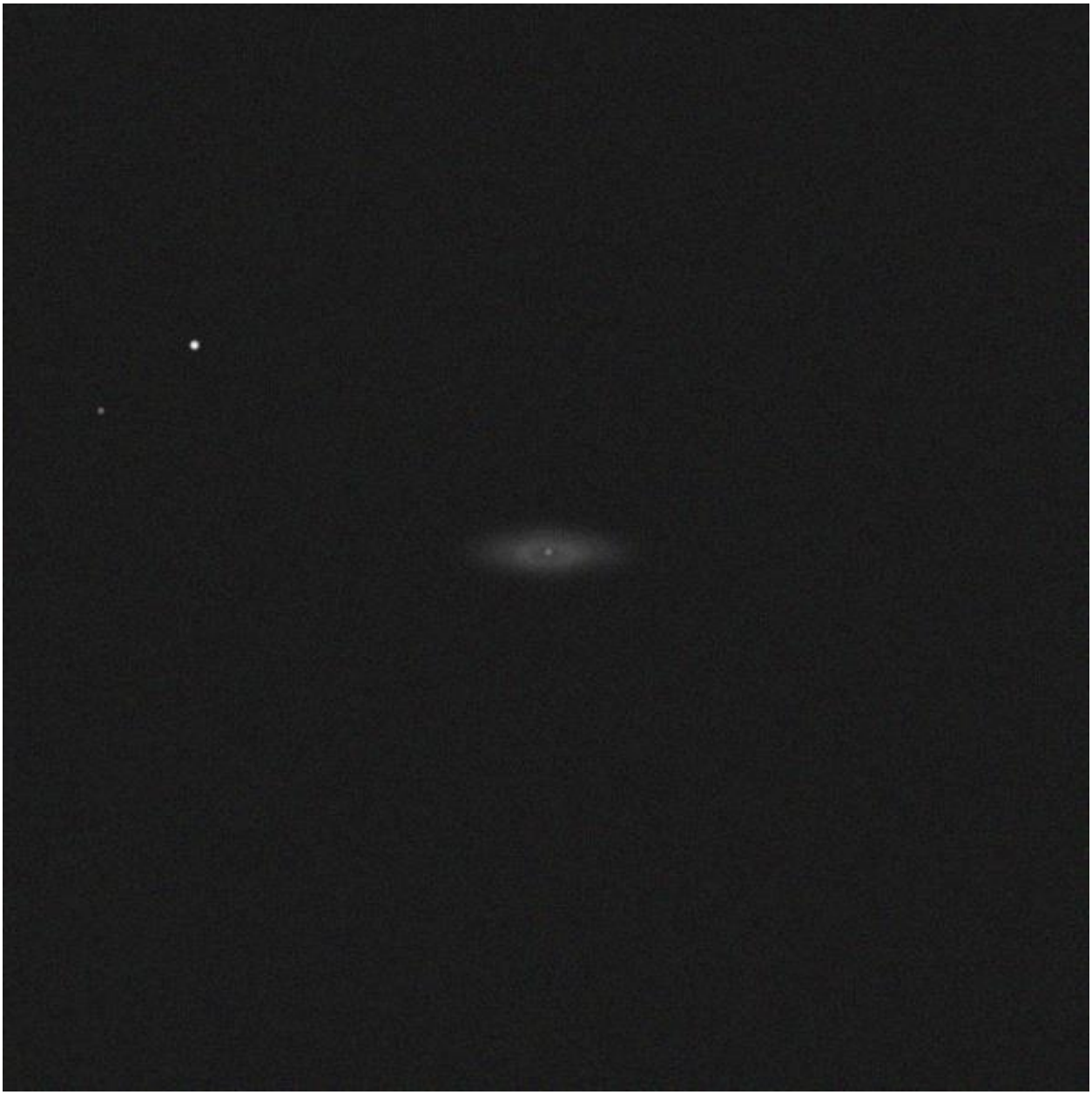
The sketches are digital reproductions of raw pencil sketches behind the eyepiece at powers of 200× and 278×.

The fov is 22′. North is up. West to the right.

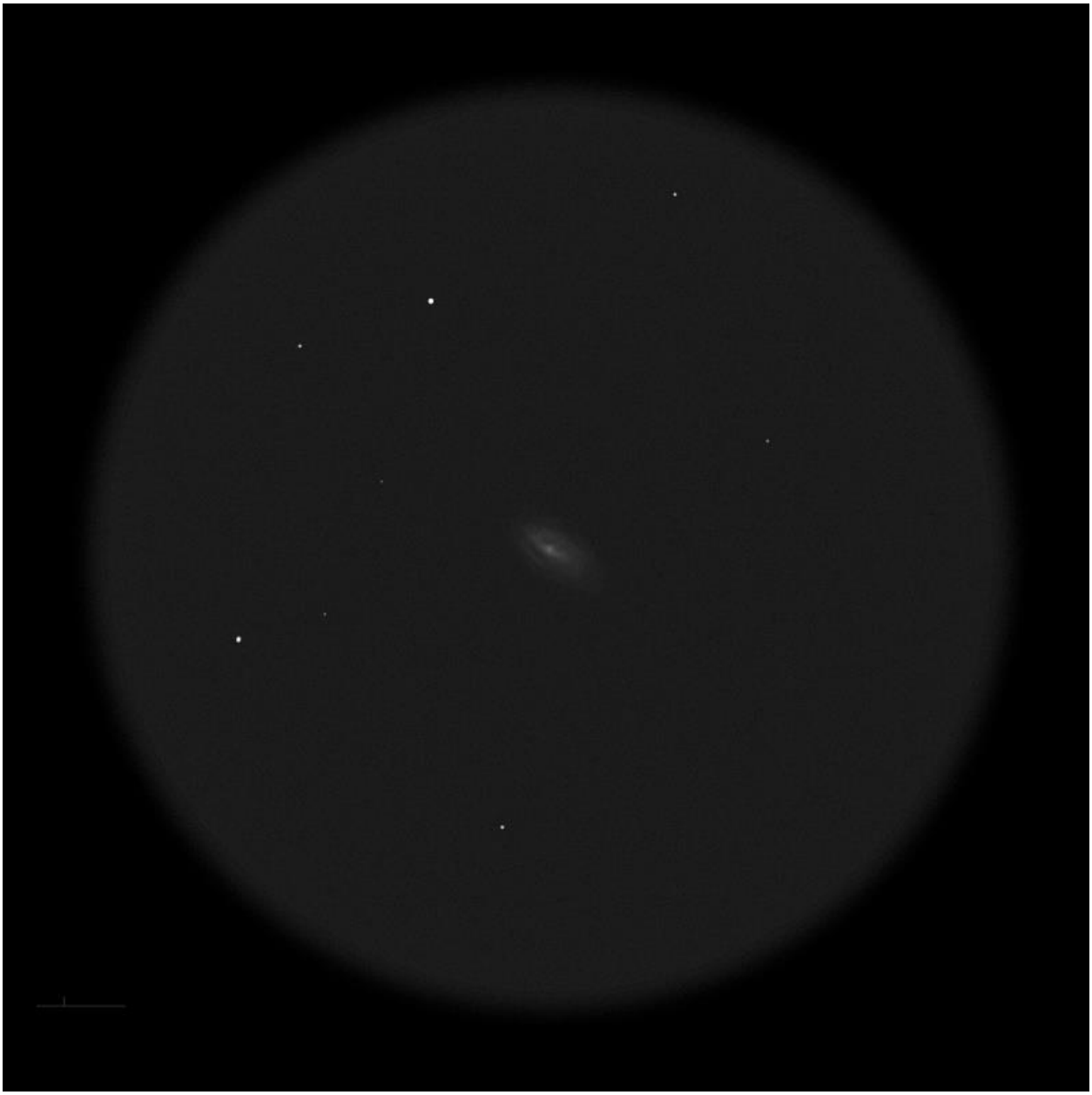
NGC 5689



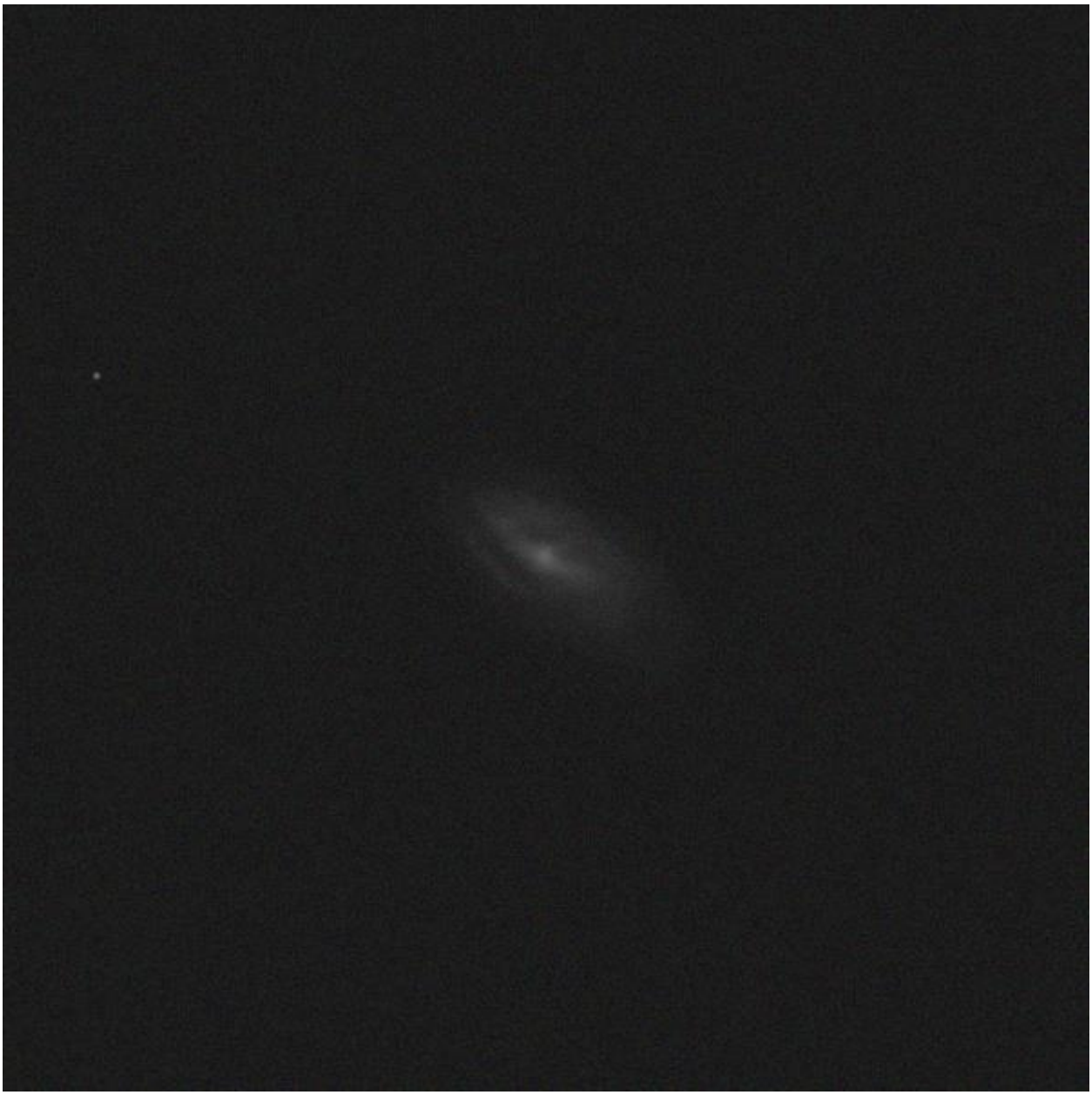
NGC 5689 cropped



NGC 5676

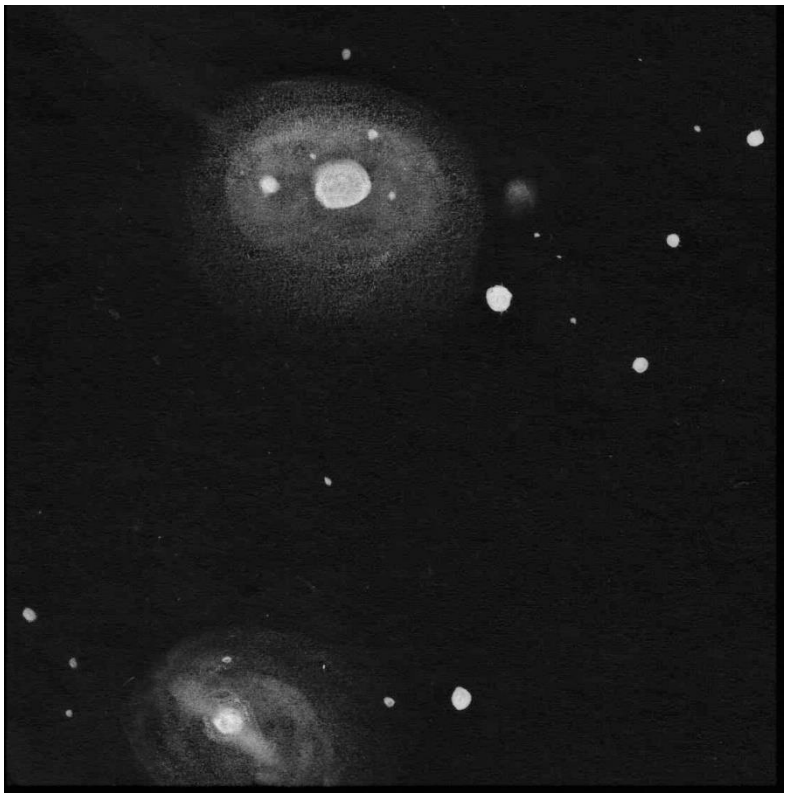


NGC 5676 cropped



Dale Holt: Observer from England, 30 miles north of London

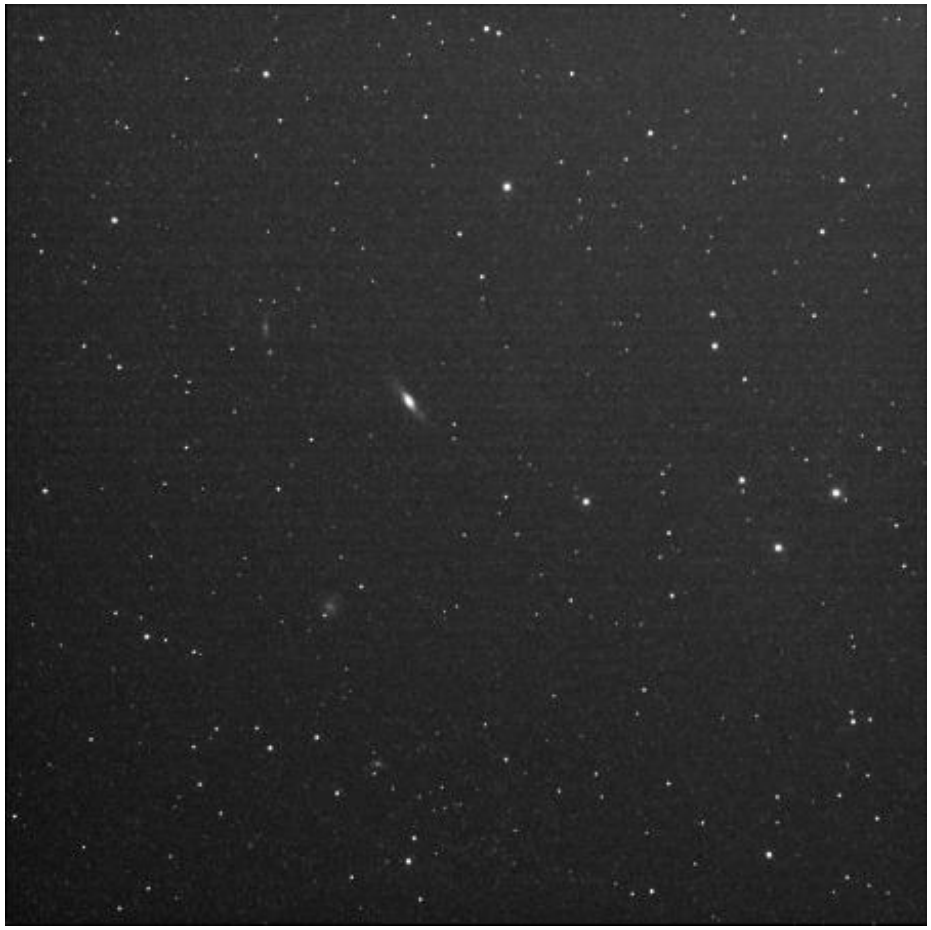
I use a 505mm f/3.74 Newtonian on a fork mount and an old analogue Watec 120N+ deep sky video camera with custom cooling. The camera is B&W and delivers its image in near real time, typically 15 sec exposure to a CRT monitor in my observatory office where I sketch from the screen. Most commonly I used graphite pencil on sketch paper although sometimes I use white on black hard pastels where the object is nebulous. Post drawing I scan the image and invert using paint. Limiting magnitude of my set up is around 19-20th mag.

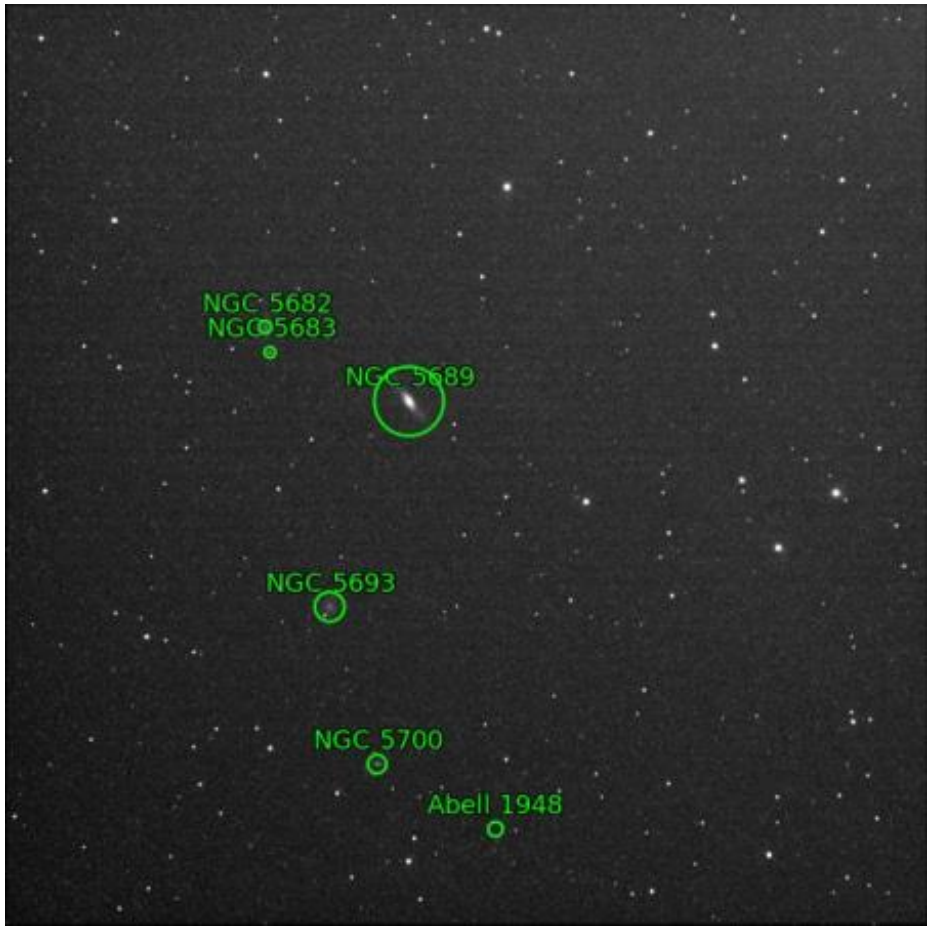


Venu Venugopal: Observer from Massachusetts

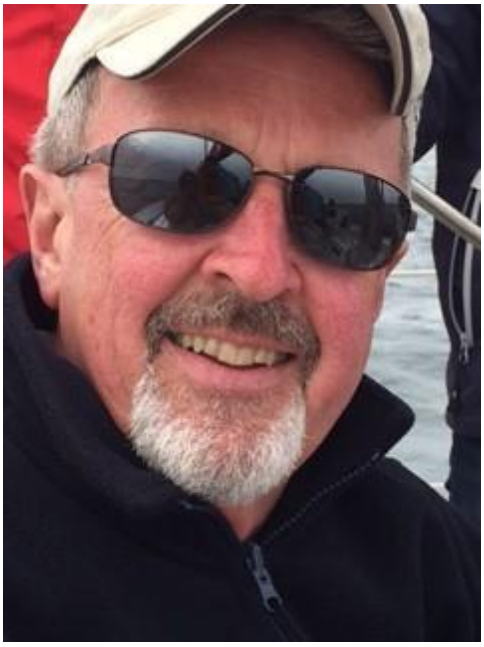
72mm Apo Refractor

Images as follow:




NGC 5682
NGC 5683
NGC 5689
NGC 5693
NGC 5700
Abell 1948

John Bishop: Observer from Massachusetts



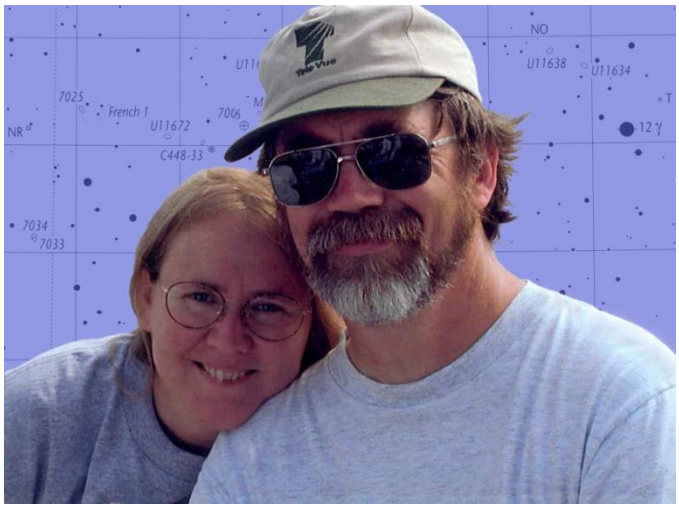
I only got a quick peek at this month's object, NGC 5689 in Boötes, at the end of an observing session on 5/13/20. I was sure I would have another session in June. I was wrong. As a result, my observation was pretty barebones; I didn't spend much time viewing the object, and I didn't see or look for NGC 5676.

I observed NGC 5689 from a remote forest setting in Plymouth, MA, about 50 miles from Boston. Conditions were very favorable. The sky was clear; transparency and seeing were good. I observed with an 8.25 inch Dall-Kirkham reflector at 48x, 100x, and 130x, using an equatorial mount with motor drive, without goto.

I found NGC 5689 fairly quickly by triangulating off Theta Boötis and Lambda Boötis, using my Telrad and 2-inch, 50-mm eyepiece. It was visible (without averted vision) as a small hazy patch with no structure or detail. With increased magnification, the galaxy was elongated, with a slight brightening at center.

The observing was particularly fine this night, benefiting from the favorable conditions at a dark sky site. Those of us observing wondered how much the COVID shutdown might have contributed to the cleaner air and lower light pollution we perceived this night.

Sue French: Observer from New York

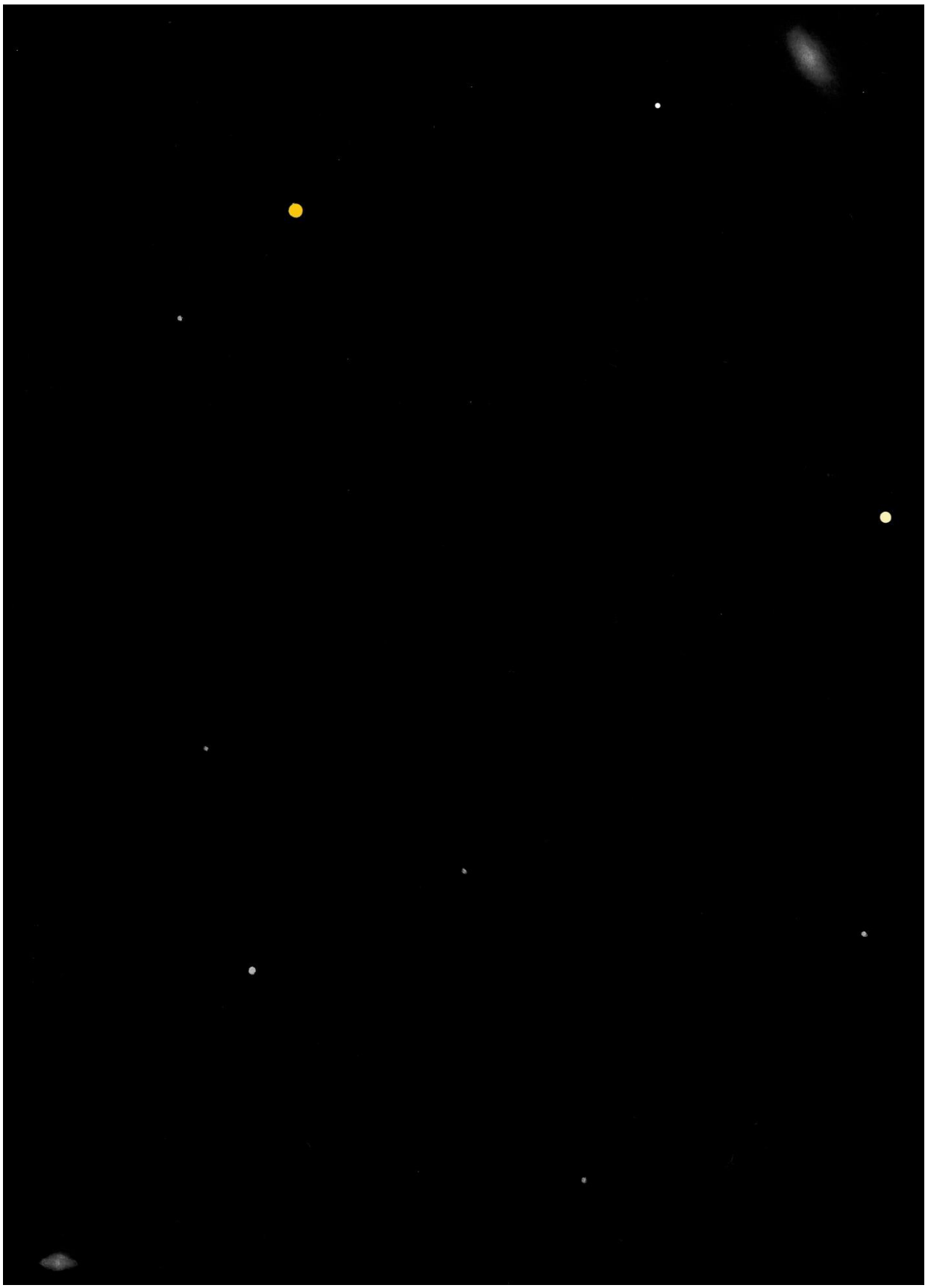


May 21, 2020

10-inch f/5.9 Newtonian reflector

Seeing: fair. Transparency: good

I can just barely squash NGC 5689 and NGC 5676 into the field of view at 88×, which has a true field of 56 arcminutes. The sketch shows this along with the brightest field stars. There wasn't much detail to be seen at this magnification, so I improved the looks of the two galaxies according to their appearance at 187×. At that power, NGC 5689 is an adorable little guy that looks very much like the archetypical UFO. The core's bulge sticks out more toward the north than the south, and it holds a brighter center. Also at 187×, NGC 5676 hosts an ovalish core, and the galaxy appears brighter NE×E of the core than it does on the opposite side.



Glenn Chaple: Observer from Massachusetts

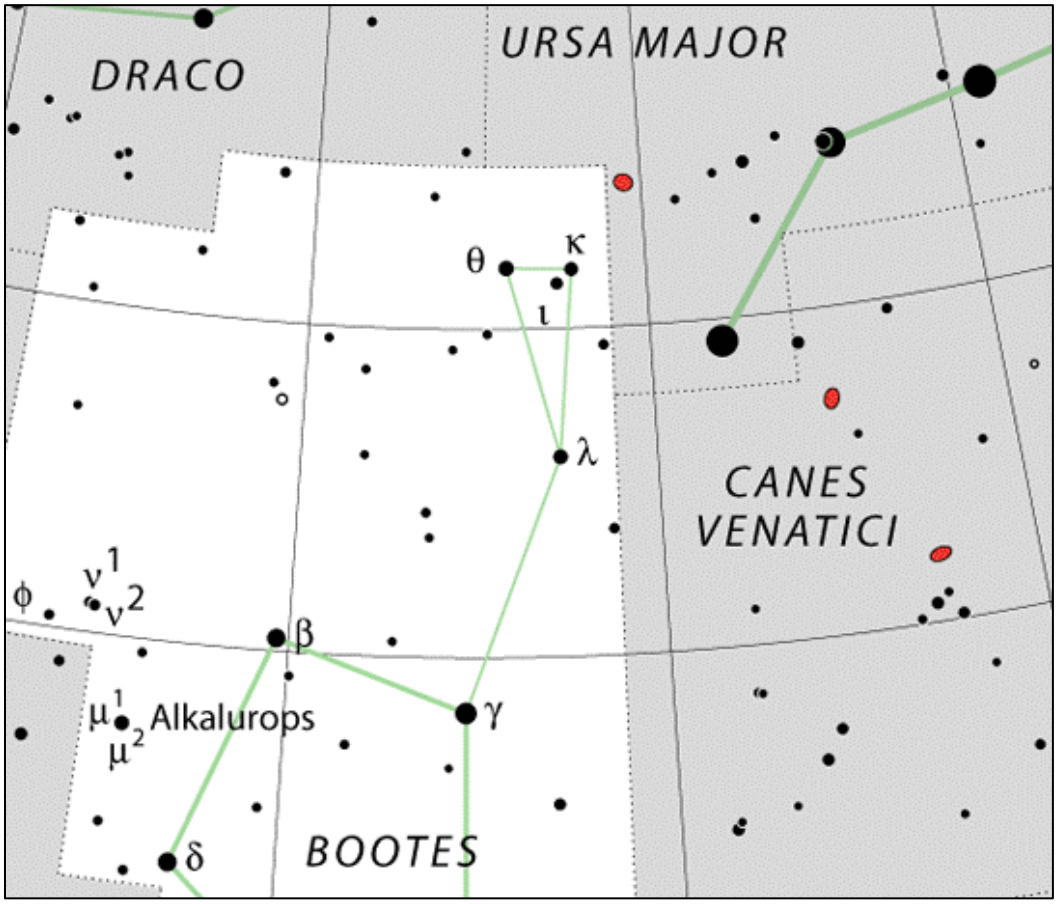
June is a difficult month for backyard astronomers here in the northern hemisphere. We battle fatigue (June sunsets are the latest of the year), haze and humidity, and – mosquitos. While yawning, sweating, and swatting, you'll be struggling to glimpse this month's Observer's Challenge, the 12th magnitude lenticular galaxy NGC 5689.

I went after NGC 5689 with a 10-inch f/5 reflector on a clear, moonless evening under typical suburban skies (limiting magnitude 5). To find the galaxy, I star-hopped, beginning from a triangle made up of the stars kappa (κ), iota (ι), and theta (θ), Boötis, located in the upper northwest corner of Boötes and east of the handle of the Big Dipper. From there, I traced a path to the 6th-magnitude stars 24 Boötis and SAO 45121. At 139× and using averted vision, I could barely make out a ghostly glow less than a degree south and slightly east of the latter star. The glimpses were so fleeting that I was unable to capture any detail. If I were to tackle NGC 5689 again, I would observe from a much darker site.

If you're limited to a small-aperture scope and/or skies compromised by artificial lighting, I encourage you to check out a trio of nearby double stars shown in the second Finder Chart. Kappa (κ) Boötis is a charming magnitude 4.5 and 6.6 pair separated by 13.7 arc-seconds. Less than a degree southeast is iota (ι) Boötis whose magnitude 4.8 and 7.4 components are a roomy 38.9″ apart. Both pairs are easily split at 30×. You'll need a boost in magnification (100× or more) to split 39 Boötis. In 2019, this magnitude 6.3 and 6.7 duo was separated by a mere 2.5″. Both are mid F-class main-sequence stars. Are you able to detect a subtle off-yellow hue?

NGC 5689 was discovered by William Herschel in 1787. Sources place its distance as somewhere between 100 and 120 million light-years. In either case, the photons striking your retina left when dinosaurs ruled the earth.

Finder Charts for NGC 5689



constellation-guide.com (*from IAU and Sky and Telescope*)

theskylive.com

Vladislav Mlch: Observer from Massachusetts

Date: May 13, 2020

Location: White Mountains National Forest, New Hampshire

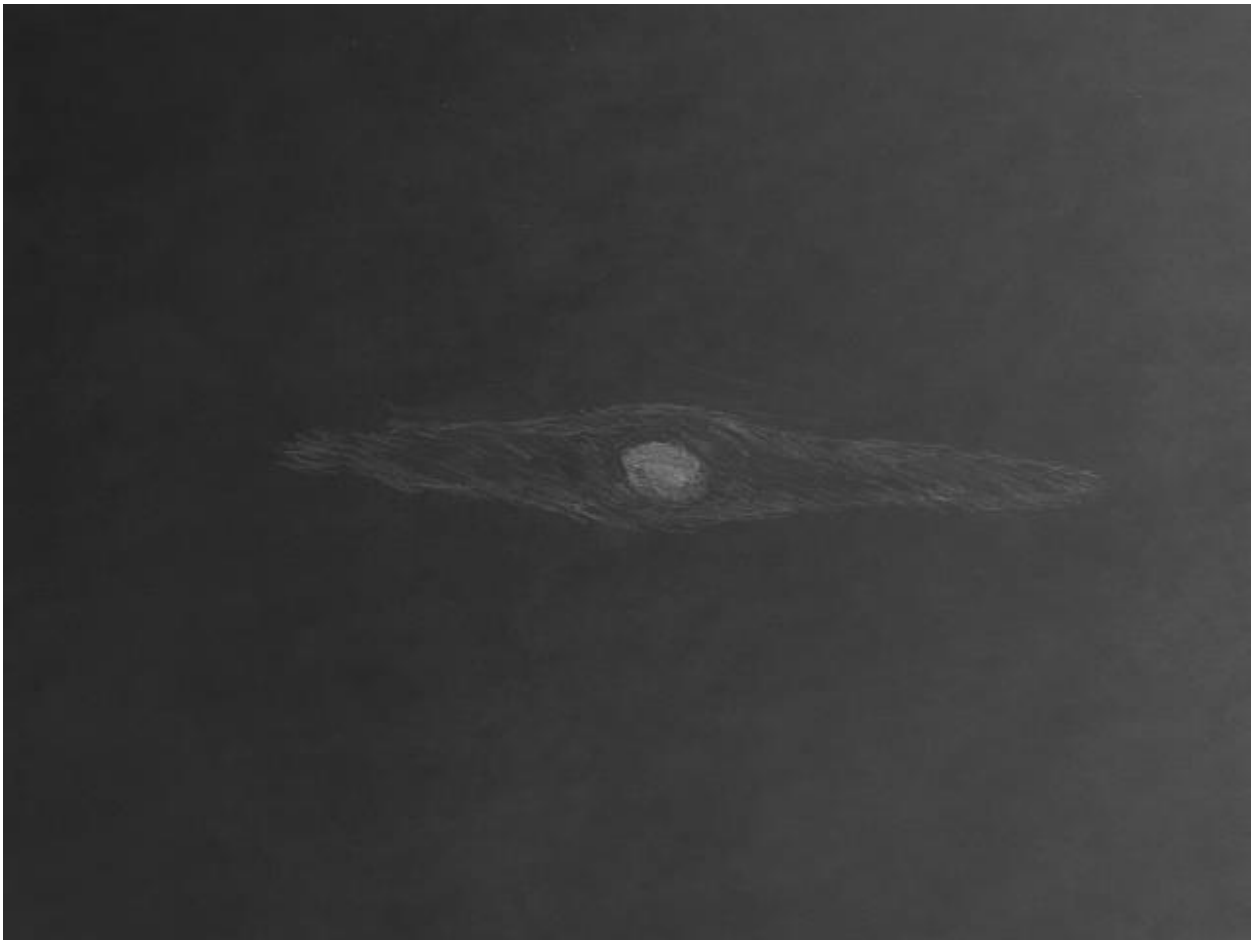
Conditions: Bortle 2, average seeing

Using: 22″ f/3.3 DOB with 10mm Ethos (185×, FOV=33′) and 6mm Ethos (300×, FOV=20′)

Filter: no filter used

Notes: NGC 5689 is a 12th- magnitude galaxy some 120 million light-years away, so I was surprised I could actually see the bright galaxy core and its shape, the “elongated smudge.”

Pencil sketch as following:



Mike McCabe: Observer from Massachusetts

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June was a tough month for me as far as observing goes. I don't like the late onset of darkness, and on top of that the weather wasn't very cooperative. Also, the past several years have had the planets in the evening sky to occupy me while it gets dark. Now with nothing to fill the two hour twilight zone I often find myself falling asleep before astronomical dark sets in, and once that happens it's over.

I did get out a few times though, and during those times the sky was pretty good for this time of year. On the evening that I tackled the observer's challenge the sky was variable, with large banks of clouds coming through and causing me to temporarily abandon my efforts until they passed by. During the times that the Boötes area of the sky was clear, the transparency was about 2/5 and the seeing was also 2/5. That's about average for my area. One thing that wasn't average though was the temperature – at 23:00 it was still 75ºF and the humidity was 84%! It was definitely a sticky night.

I used a 10-inch f/5 Newtonian reflector on a dob base, and my sketch was made at a magnification of 104×. The star hop was an easy one from Alkaid, the star that marks the end of the handle in the Big Dipper. That was good, because I had to do it several times due to the cloud situation. I found the galaxy to be readily visible in the eyepiece and the orientation was clearly discernible. Interestingly the field of view was quite sparse, save for a couple of 10^{th}- to12^{th}-magnitude stars here and there. I wasn't able to glean any more detail about the galaxy during this observation, but then under the sky I was working with, I was pretty pleased just to be able to see it at all.

I did not get the chance to view the optional galaxy NGC 5676 due to the sky going away too badly after finally getting 5689 on paper. I'm now looking forward to viewing the summer objects and trying to wring out all that extended nebulosity that they all offer. Pencil Sketch:

OBSERVATION LOG - OBJECT: NGC 5689

DATE 6-24-20 /z TIME 23:00 /z EDT LOCAL OBSERVING LOCATION 42°N 71°

SCOPE/APERTURE 10" F/5 NEWTONIAN

EYEPIECE 12mm MAGNIFICATION 104x

FILTER — SEEING 2/5 TRANSPARENCY 0/5 TO 2/5

TEMP 75° BARO PRES. — WIND CALM

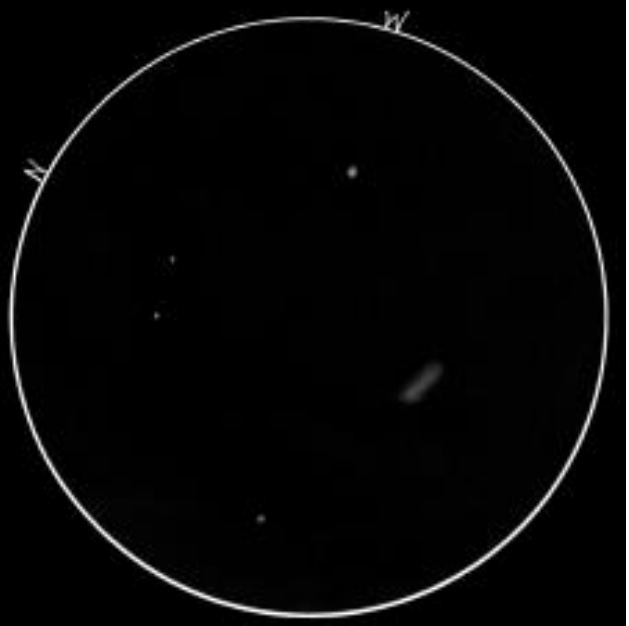
COMMENTS:

EASY STAR HOP FROM ALKAID - GOOD THING - HAD TO START OVER SEVERAL TIMES DUE TO CLOUDS.

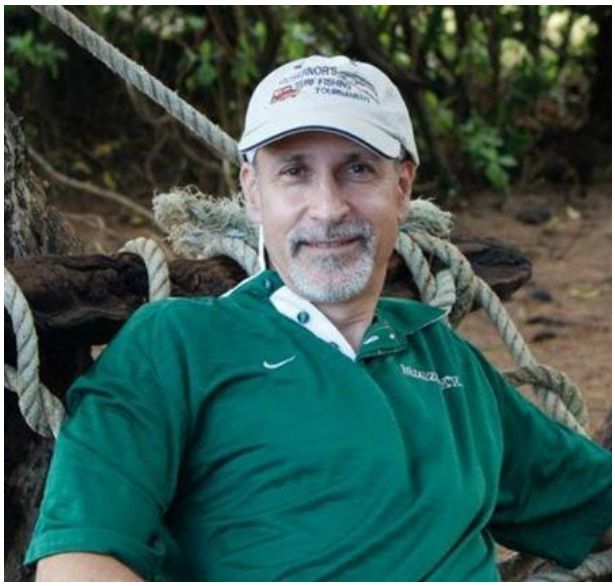
SKY QUALITY BORTLE 6.

GALAXY NEARLY VISIBLE. ORIENTATION CLEARLY DISCERNED.

ORIENTATION AND/OR ROTATION



James Dire: Observer from Illinois



NGC 5689 is a magnitude 11.8 galaxy in Boötes. The galaxy is located 10 degrees north of Gamma Boötis and 8 degrees east of the star Alkaid, the star at the end of the Big Dipper's handle. Some classify this galaxy as lenticular while others claim it is a barred spiral galaxy. The galaxy is nearly edge on and has a relatively bright core and galactic bulge with a faint featureless disk.

I imaged the galaxy over several nights under less than idea atmospheric conditions. I used an 8-inch f/8 Ritchey–Chrétien Cassegrain (with a Tele Vue 0.8× focal reducer/field flattener yielding f/6.4) and an SBIG ST-2000XCM CCD camera. The total exposure time was 4 hours. In the image north is up and east to the left.

Two other notable galaxies in the image are NGC 5682, a 14.3 magnitude spiral galaxy to the southwest of NGC 5689, and NGC 5693, a 14.2-magnitude face-on spiral galaxy. There are scores of other galaxies in the same image ranging from magnitude 15 to 18. The bright star at the top of the image is magnitude 10.2.

Chris Elledge: Observer from Massachusetts

On June 16th @10:30pm EDT, I used a 10-inch f/5 refractor to observe NGC 5689 from Arlington, MA. Sky conditions were: Bortle Scale 7; NELM 4.5; Transparency: Good; Seeing: Excellent.

Asellus Primus was barely visible in the light polluted skies of Arlington. To get to NGC 5689 I star-hopped from it to g Boötis and then CH Boötis which fit in the view of my 35mm eyepiece along with NGC 5689. At this low power of 36× the galaxy is difficult to consistently detect with averted vision appearing as just a faint spot against the background. There is a line of 3 bright stars mag. 5 to mag. 8 to the North running NE-SW (HD 128643, CH Boötis, & HD 127930). There is an arc of 5 mag. 8 to mag. 10 stars to the SE (HD 128718, TYC 3476-0987-1, SAO 45150, SAO 45156, & HD 129308) that bends to the NW in the middle like a bow. Two more mag. 10 stars near the middle point to the SE forming an arrow in the bow that points NW towards a trapezoid of mag. 10 to mag. 11 stars (TYC 3476-1064-1, TYC 3476-1489-1, TYC 3476-0680-1 & TYC 3476-0722-1). The 2 parallel sides run North-South. The shorter side is to the East away from the galaxy (TYC 3476-0680-1 & TYC 3476-0722-1). There is a fainter 5th star in the middle visible with averted vision (TYC 3476-1348-1). To the West of the NW star in the trapezoid is another mag. 10 star (TYC 3476-0252-1), and the galaxy sits about the same distance to the West of the SW star in the trapezoid (TYC 3476-1489-1).

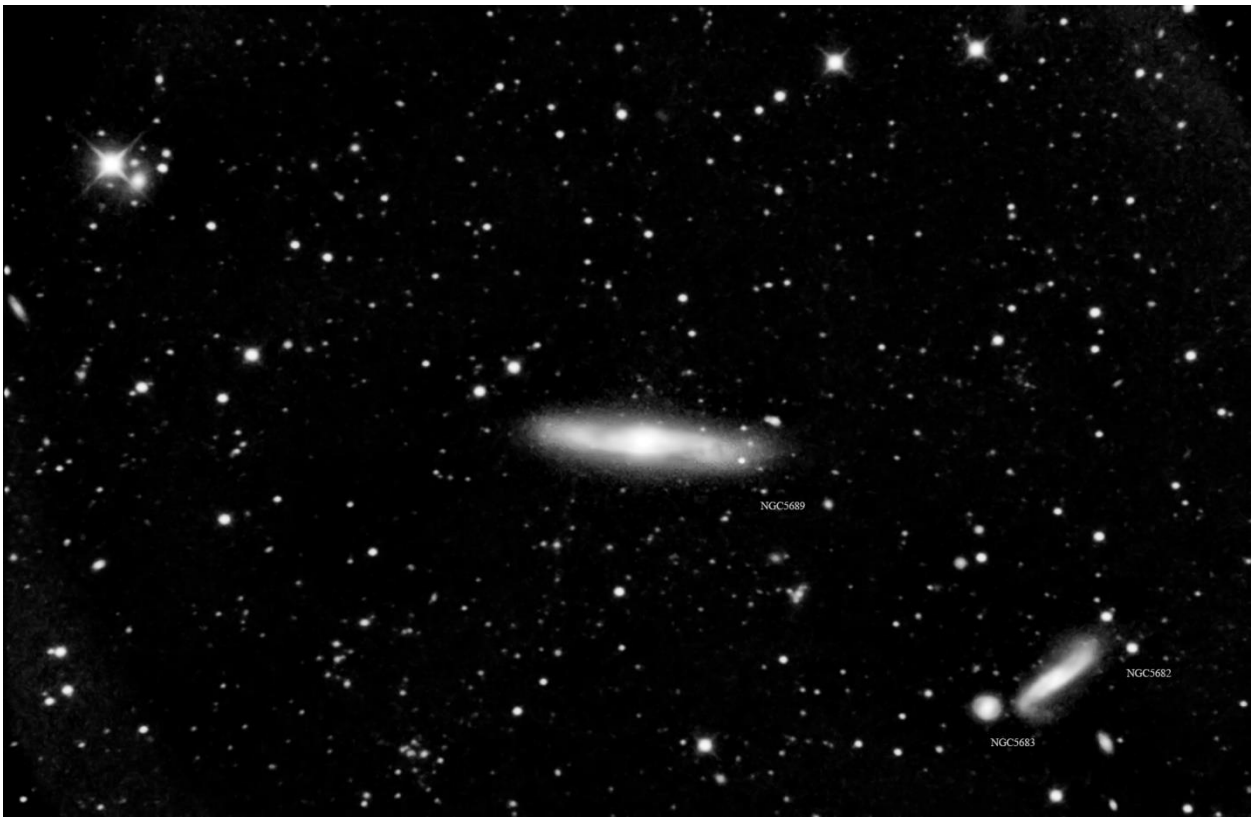
At 115× (11mm) the galaxy NGC 5689 is visible with averted vision, but it's difficult to keep it from disappearing while focusing my attention on it. I can't get any hint of the elongation or shape of the galaxy, just its presence. The Western edge of the trapezoid of stars is still visible in the view, and a fainter star just to the NW of the NW star of the trapezoid is visible (TYC 3476-0572-1). Two mag. 13 stars also appear between the galaxy and the mag. 10 star to its North.

At 270× (4.7mm) NGC5689 is still visible with averted vision. It is easier to detect it while panning the telescope view around. It appears as a slight and small glow against the background. There is a tiny hint of elongation in the East-West orientation.

Mario Motta: Observer from Massachusetts

After more than a month of rain and clouds, I finally had a clear night for, NGC 5689. Also noted are NGC 5682-83 in lower right side of field. This group is 110 million light years away.

Taken with 32-inch telescope, 45 minutes total integration time, with ZWO ASI6200 camera, and processed PixInsight. I normally take a minimum of over 60 minutes, and I did… but had to drop 4 frames due to incredibly bright satellite trails, unusual that far north. These trails were much brighter than ordinary satellites, and could not be fully removed with processing, so I had to drop frames. I suspect Starlink satellites, a bad taste of what I suspect is the future, and only a small fraction have yet been put in orbit.



Joseph Rothchild: Observer from Massachusetts

I observed NGC 5689, a small galaxy in Boötes. I observed at Cape Cod under fairly dark skies with my 10-inch reflector.

The galaxy was fairly straightforward to find, but needed to be differentiated from other faint galaxies in the area. I confirmed its location near a small line of 3 stars. The galaxy formed a square with three other stars, one of which was a double.

The galaxy itself was small, faint, and oval in shape without discernible structure. It was best seen at 89×.

I had never observed this galaxy before, so I was thankful it was on the challenge list for this month.

Roger Ivester: Observer from North Carolina

Telescope: 10-inch f/4.5 reflector

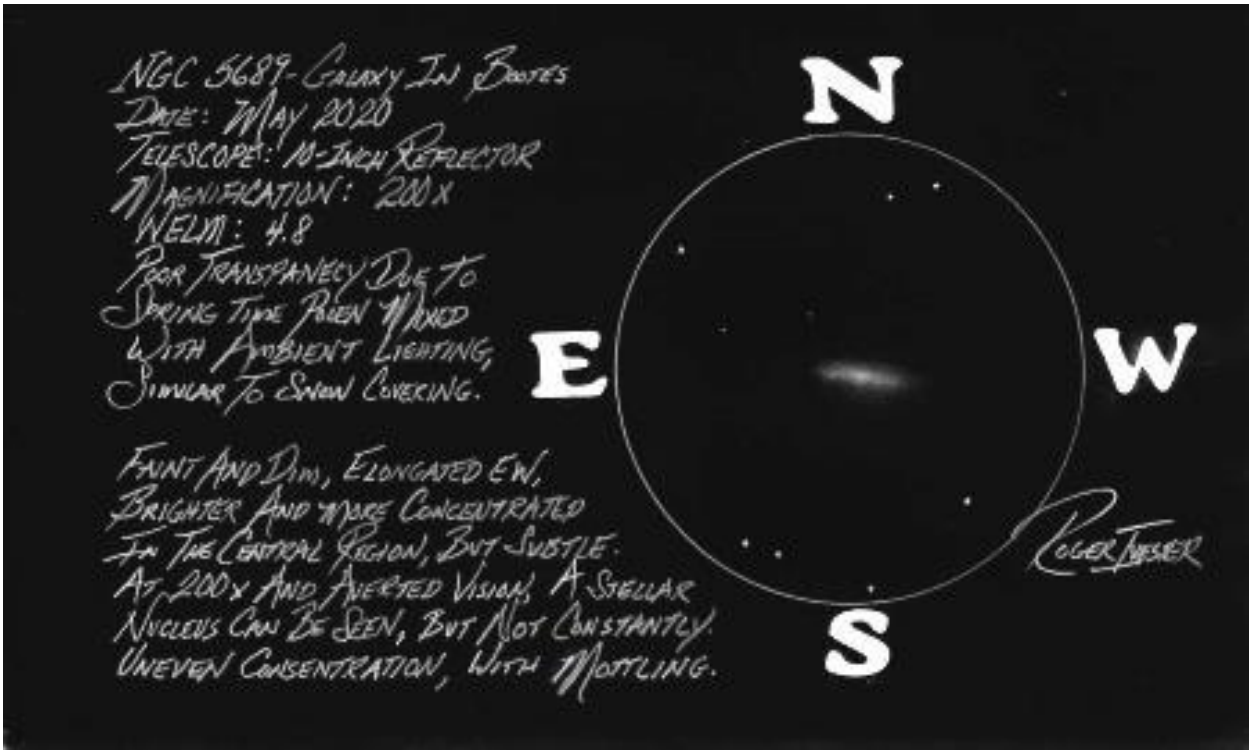
Sketch Magnification: 200×

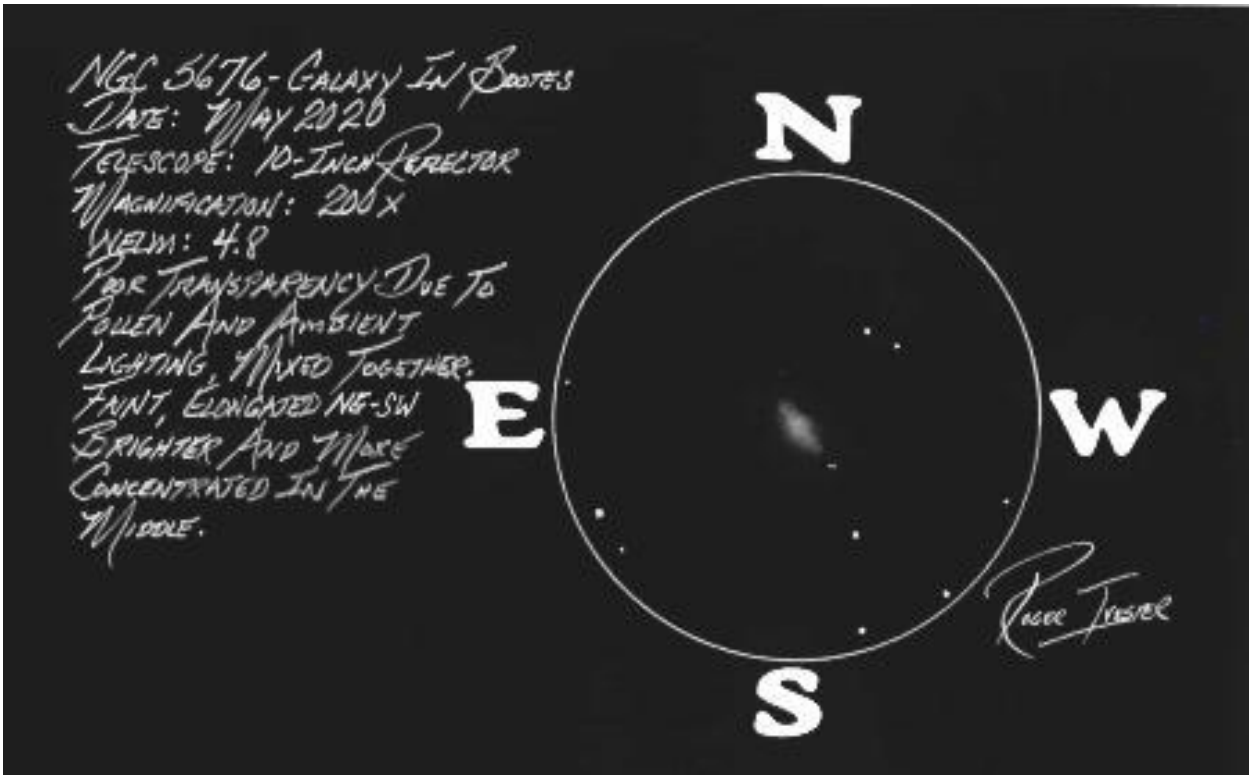
NELM: 4.8

Faint and dim from my moderately light polluted backyard. Poor transparency, due to springtime pollen and ambient lighting mixing together creating sky glow, similar to snow covering.

NGC 5689: Elongated E-W, brighter central region, with mottling in both the core and arms. When using averted vision at 200×, a stellar nucleus can be seen, but not constantly.

NGC 5676: 50 arcminutes to the NNW of NGC 5689, lies galaxy NGC 5676. A bit brighter than NGC 5689. This galaxy is elongated, oriented NE-SW, without any center brightness, very soft with even texture. But with very careful and patient observing using averted vision, the southwestern section appears to have greater concentration, and brighter than the northeastern part. However, very subtle.





The following is the complete listing of all Observer's Challenge reports to-date.

https://rogerivester.com/category/observers-challenge-reports-complete/