MONTHLY OBSERVER'S CHALLENGE

Compiled by:

Roger Ivester, North Carolina

&

Sue French, New York

May 2023

Report #172

NGC 4088, Galaxy in Ursa Major

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:

William Herschel discovered NGC 4088 with his 18.7-inch speculum metal reflector the night of March 9, 1788. One hundred years later, it was incorporated into J. L. E. Dreyer's famous *New General Catalogue of Nebulae and Clusters of Stars*. The summary description reads: B, cL, E 55°, lbM [Bright, considerably large, extended toward position angle 55°, a little brighter in the middle.]

Physical information courtesy of Courtney Seligman
http://cseligman.com/text/atlas/ngc40a.htm#4088 **:**
Based on a recessional velocity relative to the Cosmic Microwave Background radiation of 950 km/sec (and H_0 = 70 km/sec/Mpc), NGC 4088 is about 45 million light years away, in good agreement with widely varying redshift-independent distance estimates of about 20 to 70 million light years. Given that and its apparent size of about 5.25 by 1.75 arcmin (from the images on this page), the galaxy is about 65 to 70 thousand light years across.

Uwe Glahn: Observer from Germany

Object: NGC 4088

Telescope: 16″ f/4.5 Newton

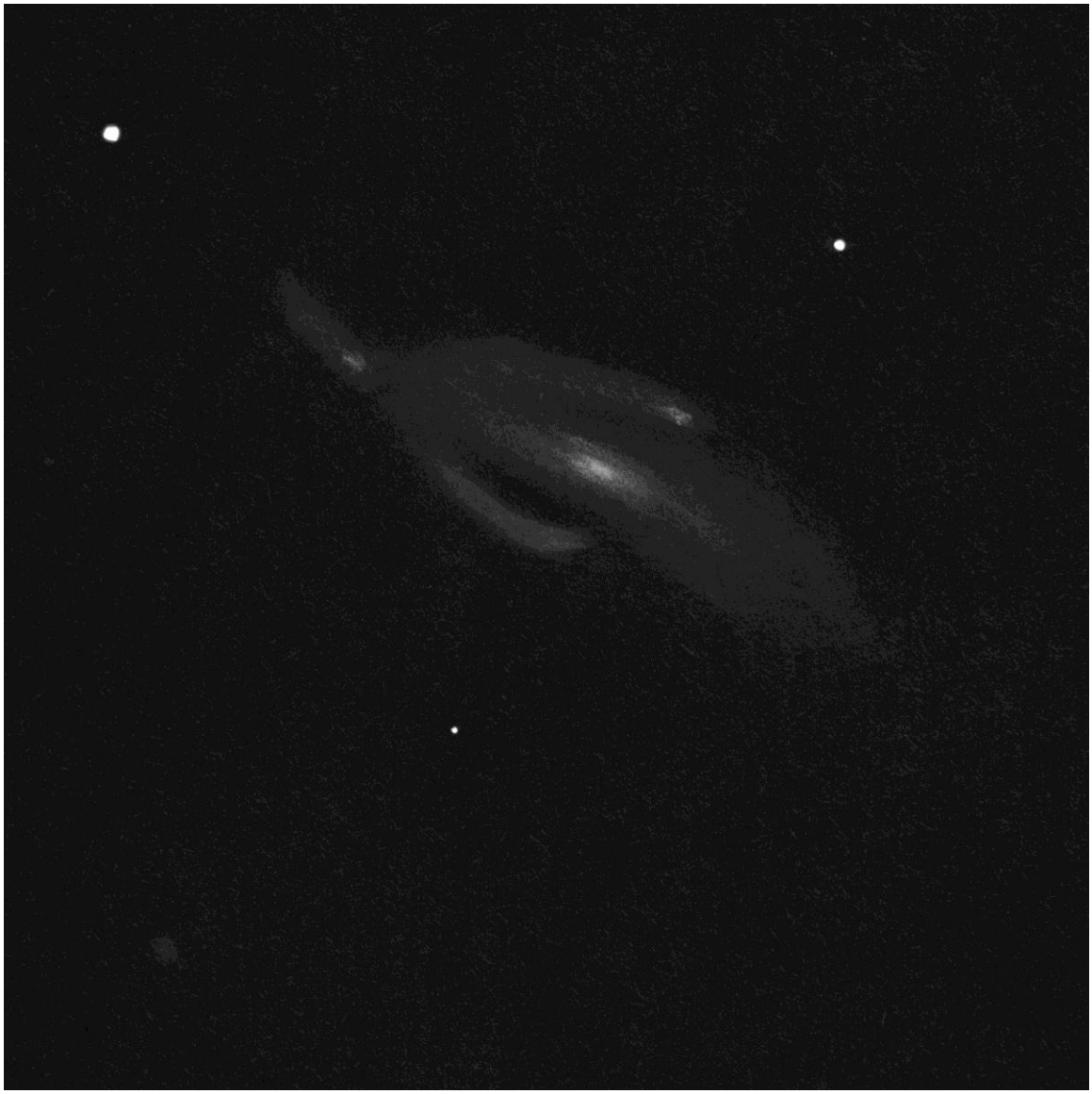
Magnification: 315×

NELM: fst 6m5

Seeing: III

Sketch follows.

You can see more of Uwe's sketches at http://www.deepsky-visuell.de/



Bertrand Laville: Observer from France

Object information

Object name:	NGC 4085
Object type:	galaxy
Magnitude:	12.00
Right Ascension:	12h 05m 54s
Declination:	50° 17′ 55" N

Date of sighting:	March 18, 2009 10:00 PM UT
Duration of observation:	100 mins
Object position:	Alt: 69.6°, Az: 61.6°

Viewing location:	Puimoisson le PetitTelle
Instrument :	TN 635 Dobson Obsession
Main eyepiece:	Televue Ethos 8mm
Barlow:	(None)
Magnification:	390x

Ratings

x102 Nagler 31mm

100 minutes is the total duration of the field observation.

It's a magnificent sight: the background sky is very black, almost devoid of stars, and, in the middle, float two luminous galaxies, NGC 4085 and 4088. One, NGC 4085, is a spindle, and the another, NGC 4088, is a diving cormorant, wings folded.

NGC 4088

x390 Ethos 8mm

This galaxy, NGC 4088, is a marvel: it floats in space, especially since it reminds me of a bird [Note 2009 08 19: I wrote this sentence after drawing NGC 4085, so maybe 15 or 20 minutes after writing the same thing to describe the field with the Nagler 31mm. (So this vision must have made its mark upon me!)

It is very structured: the two wings are absolutely separated from the body by two dark bands, the dark band on the SE even more pronounced than the opposite one. On each wing, a reinforcement terminated by a quasi-stellar knot, the two knots being symmetrical with respect to the central condensation.

The head is very elongated, with a very clear reinforcement at the base (of the neck).

The central condensation is very elongated: it is not a circle.

x650 Nagler 4.8mm

The central condensation is completely resolved: the L7 area [luminosity on a scale of 1 to 10] is an ellipse, a/b ~ 3, about 10" x 3", with a star in the center, or absolutely stellar core. The CCD photos seem to show that this "L7 ellipse" is in fact composed of 2 lateral stars, opposite and adjacent to the central star (at 650x a star is a spot of 1" to 3" in diameter depending on its visual magnitude); if I saw the central star well, I did not perceive the two lateral stars.

NGC 4085

x390 Ethos 8mm

NGC 4085 is a spindle whose ends gradually weaken, L2. These are not tapered, but gradually weaken while keeping the same thickness. D ~ 2′ x 0.4′

The central 1/3 is L4, bright, and granular, but impossible to draw. The central condensation is L5 to L6, similar to the halo, and very elongated, d ~ 30" x 8". There is no core, stellar or not, but an L6 area is d ~ 15" x 4"

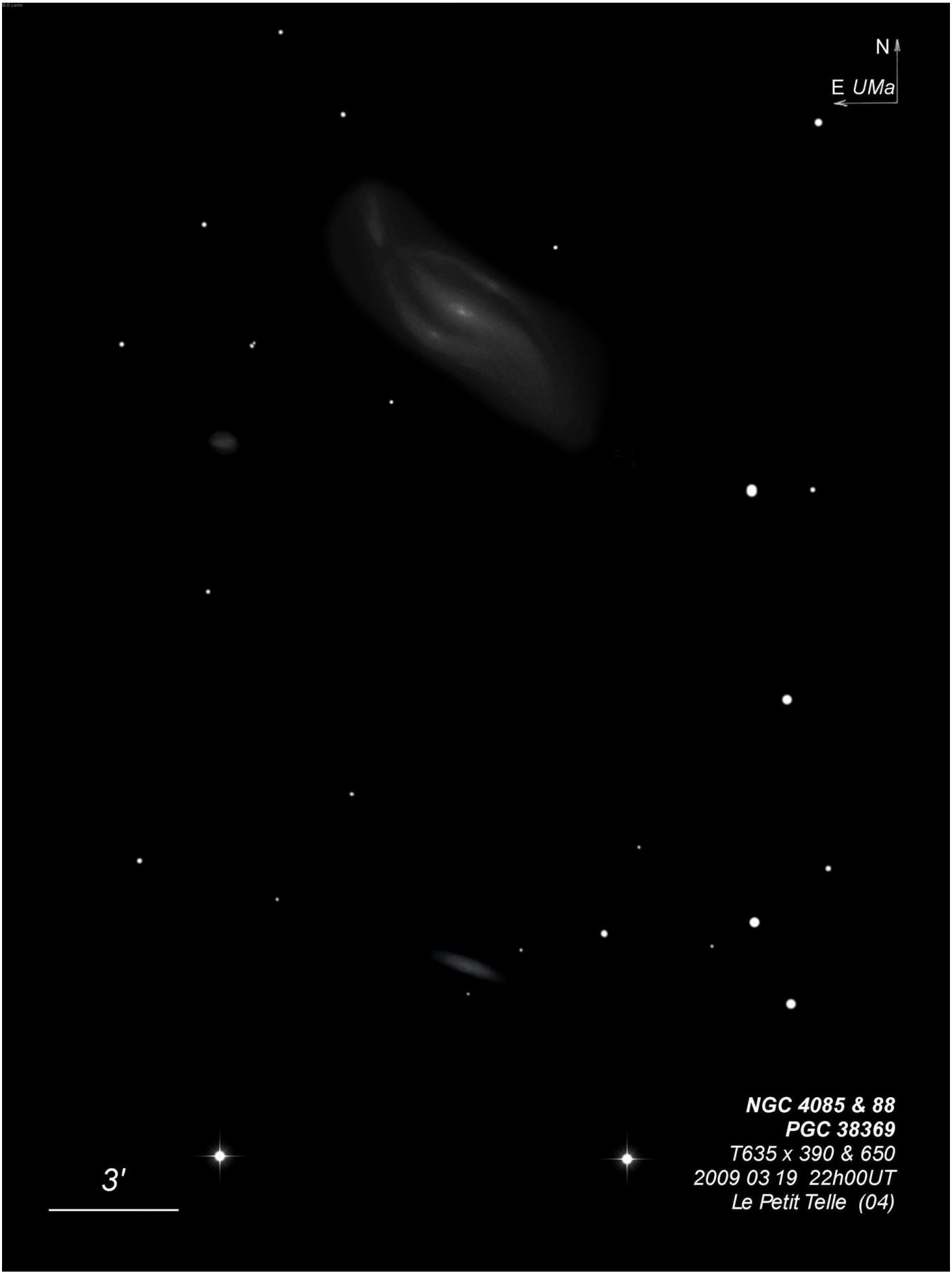
PGC 38369

PGC 38369 was not recognized until I discovered it while analyzing CDD photos to validate my account of NGC 4088. The galaxy is faint, but well recognized now that I know of its existence. The shape is +/- round, with a hard and weak gradient; the edges are very blurry. D~20"

x654 Nagler 4.8mm

PGC 38369: the bar appears, difficult, in position angle ~ 60°. The halo lengthens, a/b ~ 1.5, in the same position angle. The edges also remain blurry, and the entire galaxy is very faint.

You'll find more detailed descriptions of Bertrand's sketches at: http://www.deepsky-drawings.com/


N
E UMa
3′
NGC 4085 & 88
PGC 38369
T635 x 390 & 650
2009 03 19 22h00UT
Le Petit Telle (04)

Dave Giordano: Observer from Massachusetts

The May Observer's Challenge object, galaxy NGC 4088 allowed more viewing time between the trees in my yard, as compared to the April galaxy. My image consists of 77 600-second frames, for a total integration time of 12.8 hours. I'm still having a challenge with the cooling with my ASI 294 MC Pro, so most of the subframes were taken at 32º F instead of the usual 10º F. It does not appear to have lessened the quality of the image.

Gear utilized: Celestron Edge 8-inch SCT, 0.7× reducer (1500mm focal length), Off-Axis Guider with ASi 174 guide cam, Baader Neodymium filter, and ASI 294 MC Pro camera. Processed in PixInsight.

Imaging from my backyard in Carlisle is challenging, especially for targets lower on the horizon, with surrounding trees. My window of opportunity for NGC 3044 was very narrow, and I only got twenty 300s subframes. I also encountered frost on my sensor, which shows as a faint ring around the galaxy.

Image Follows.


okay in the woods

Mircea Pteancu: Observer from Arad, Romania

Affiliated with Hungarian Astronomical Assoc., Romanian Society for Cultural Astronomy,
‘’Galaxis’’ Astronomy Club, moderator on *astronomy.ro* forum.
https://observoergosum.blogspot.com/
https://www.astronomy.ro/forum

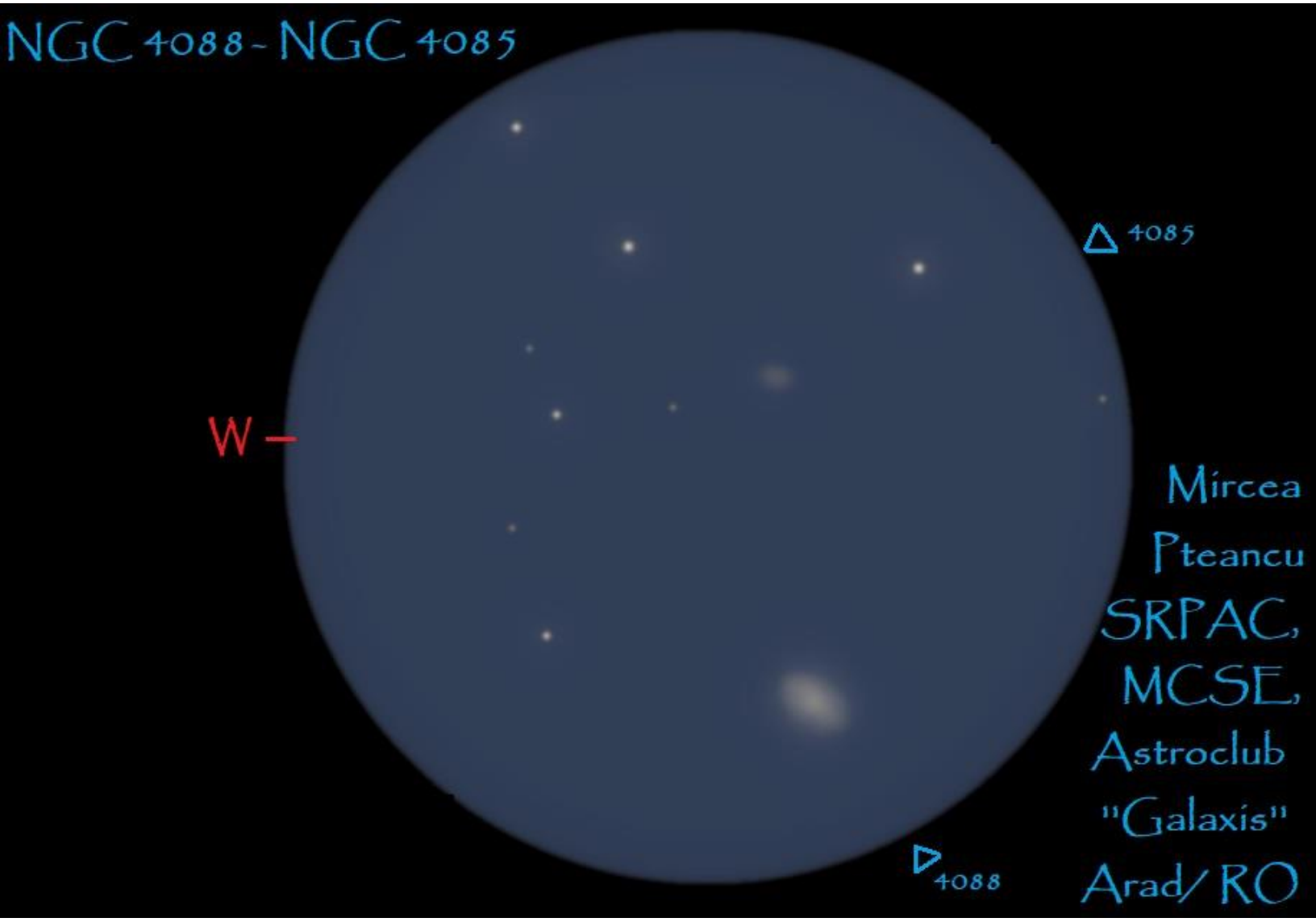
At my observation site, the weather this Spring has been terrible for deep-sky observing, with the sky being almost permanently cloudy and or hazy.

I had only one opportunity to observe galaxy NGC 4088, being on March 21. The telescope used was my “SkyWatcher Classic 250P” Dobsonian reflector at 171× in a 28 arc minute field. My sketch was obtained with a 7mm UWA eyepiece. The observation site used provides a Bortle5/6 sky in good conditions. However, on the evening of the observation, haze and thin clouds were present in the atmosphere and I think it affected the magnitude limit of my telescope by one class.

A summary of my observation session can be viewed here:
https://www.astroclubgalaxis.ro/2023/03/nereusita-de-la-trei-insule-21-martie.html

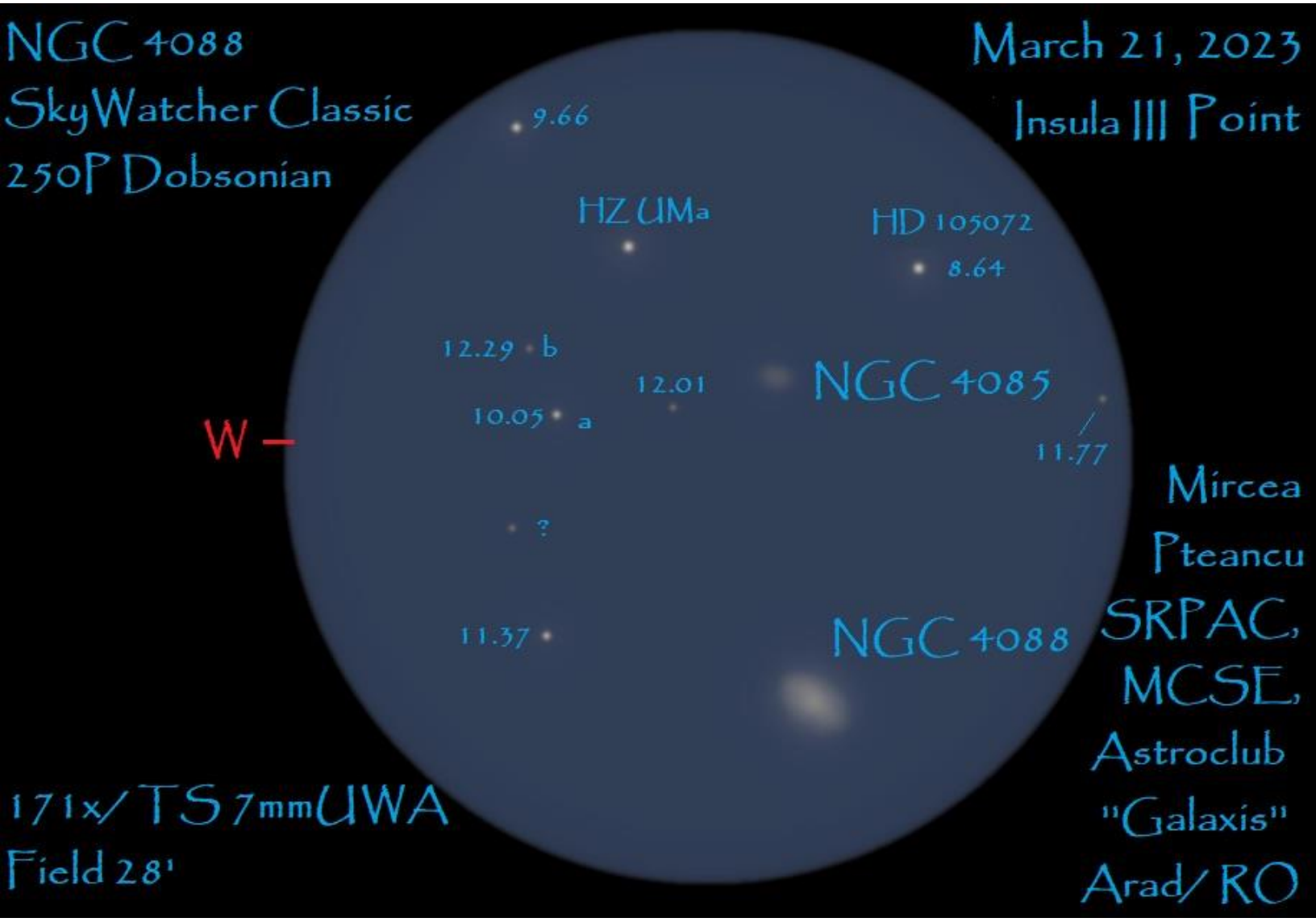
The galaxy NGC 4088 is located in the same field with the variable star HZ UMa. The object have in my telescope has a hazy aspect, pretty homogeneous with luminosity being over the entire surface. I detected only a slight increase of brightness toward its center. NGC 4088 has an oval shape, the long axis being oriented toward PA 30° to 40º and equal in length to the distance between stars marked as “a” and “b”.

I estimated the short axis of the galaxy to be about 60% to 70 % of the long one.



In the same 28′ field with NGC 4088, there is a much smaller and dimmer galaxy, NGC 4085.

Located to the South of NGC 4088, and really close to the variable star HZ UMa, NGC 4085 is much more difficult to see. I could only see with averted vision. Except for its existence and approximate location, I have been unable to derive a size and shape for NGC 4085.



The brightest stars in the visual field were the stars HZ UMa and the nearby star HD 105072 of magnitude 8.64.

The dimmest star in the field was the one marked “b” on the drawing, of magnitude 12.29.

I used for this report…data according to Simbad through Aladin Lite. When preparing this report, the star HD 105072 awakened my “hunter attention” because I learned through interrogation of CDS portal this is a “Double or Multiple Star”. The site “stelledoppie.it” confirmed this. The separation would be within the proven capability of my telescope but the companion being of magnitude 13.06, not much hope.

While still in Aladin Lite I did not find information about an object of stellar aspect, located to the west of the visual field, between two stars of 10.05 and 11.37 magnitudes, respectively. It is probably a not catalogued star. Who knows? Very fine field!

Ionel and Armand, two members of our club who attended the observation, saw NGC 4088 also.

Armand, who is a very keen visual observer (and much younger) saw NGC 4085 much more easily than I could. However, this was not reason for sadness to me, because he is my pupil. I am proud that I have contributed to him becoming a very good visual observer!

Venu Venugopal: Observer from Massachusetts

NGC 4088 is classified as a barred spiral galaxy located approximately 45 million light-years away in the constellation Ursa Major. Like many galaxies, it has had its fair share of interactions and collisions with other galaxies throughout its existence. These encounters can dramatically reshape a galaxy's structure, trigger the formation of new stars, and even ignite intense bursts of star formation. NGC 4088 bears evidence of such interactions. Astronomers have observed irregularities and distortions in its spiral arms, suggesting

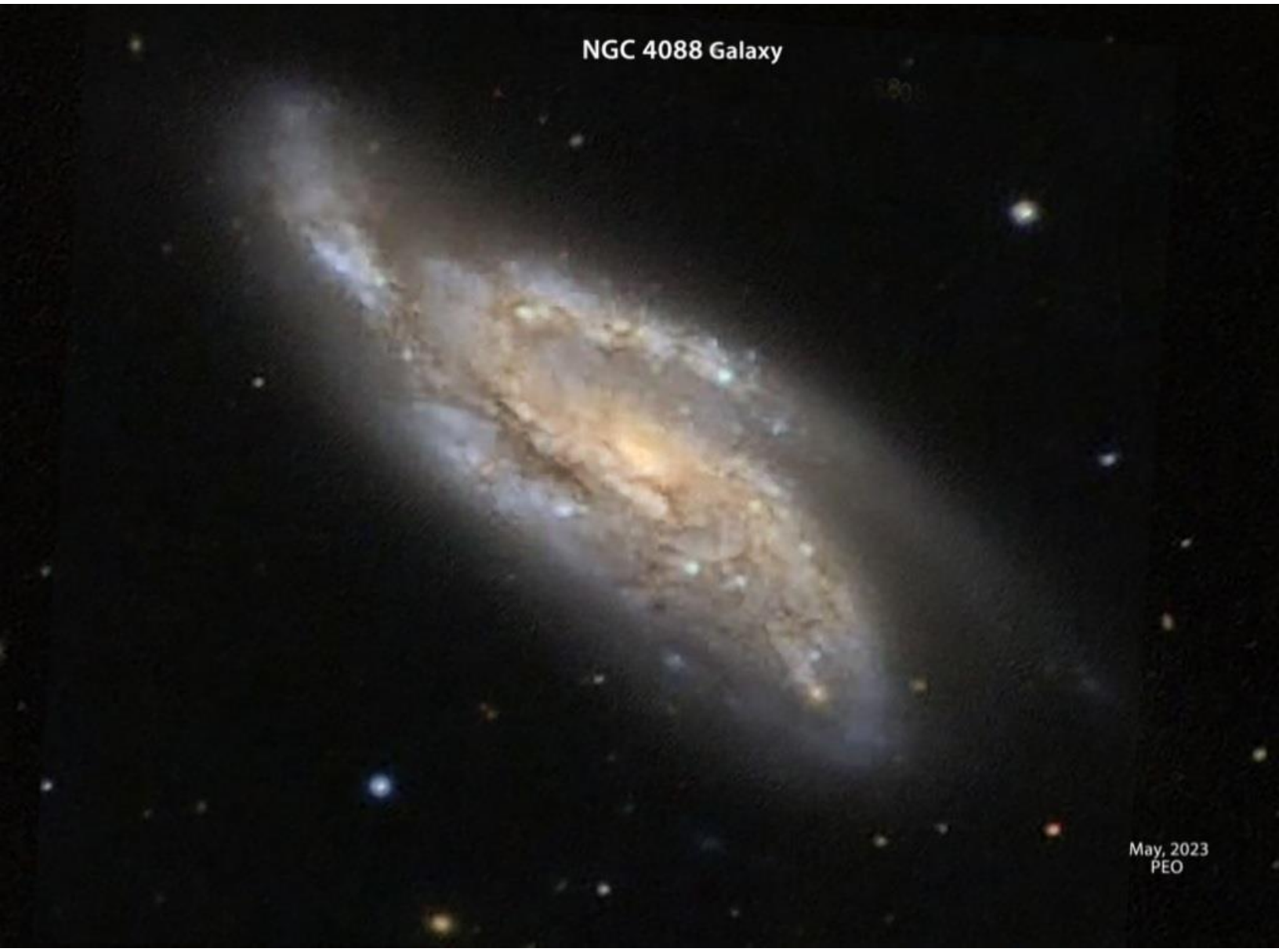
that it has experienced close encounters with other galaxies in the past. These interactions likely caused gravitational disturbances, causing waves to ripple through the galaxy and altering its shape.

Capture details: 1.5 hours of exposure with 8-inch Skywatcher Quattro f/4 Newtonian, 30 second subframes, guided GEM45, processed in Pixinsight.

Phil Orbanes: Observer from Massachusetts

This unusual spiral is found in Ursa Major and is among the 50 or so galaxies of the M109 group.

One of its arms appears disconnected when viewed through large telescopes, and for this reason has earned a place in Alton Arp's Atlas of Peculiar Galaxies. NGC 4088 lies 51 million light years away. My RBG photo includes about 5 hours of imaging per channel with my 14-inch Planewave reflector and FLI 16803 CCD camera.



Larry McHenry: Observer from Pittsburgh, Pennsylvania

http://stellar-journeys.org

Larry McHenry: Observer from Pittsburgh

The 44° inclined spiral galaxy ***NGC4088*** is located in the constellation of Ursa Major – "The Great Bear", about 3.4° from the bright Big Dipper bowel star +2.5 mag Gamma Ursa Major (Phad).

This bright, deep-sky galaxy is about 51.5 million light-years distant, with a diameter of about 65,000 ly.

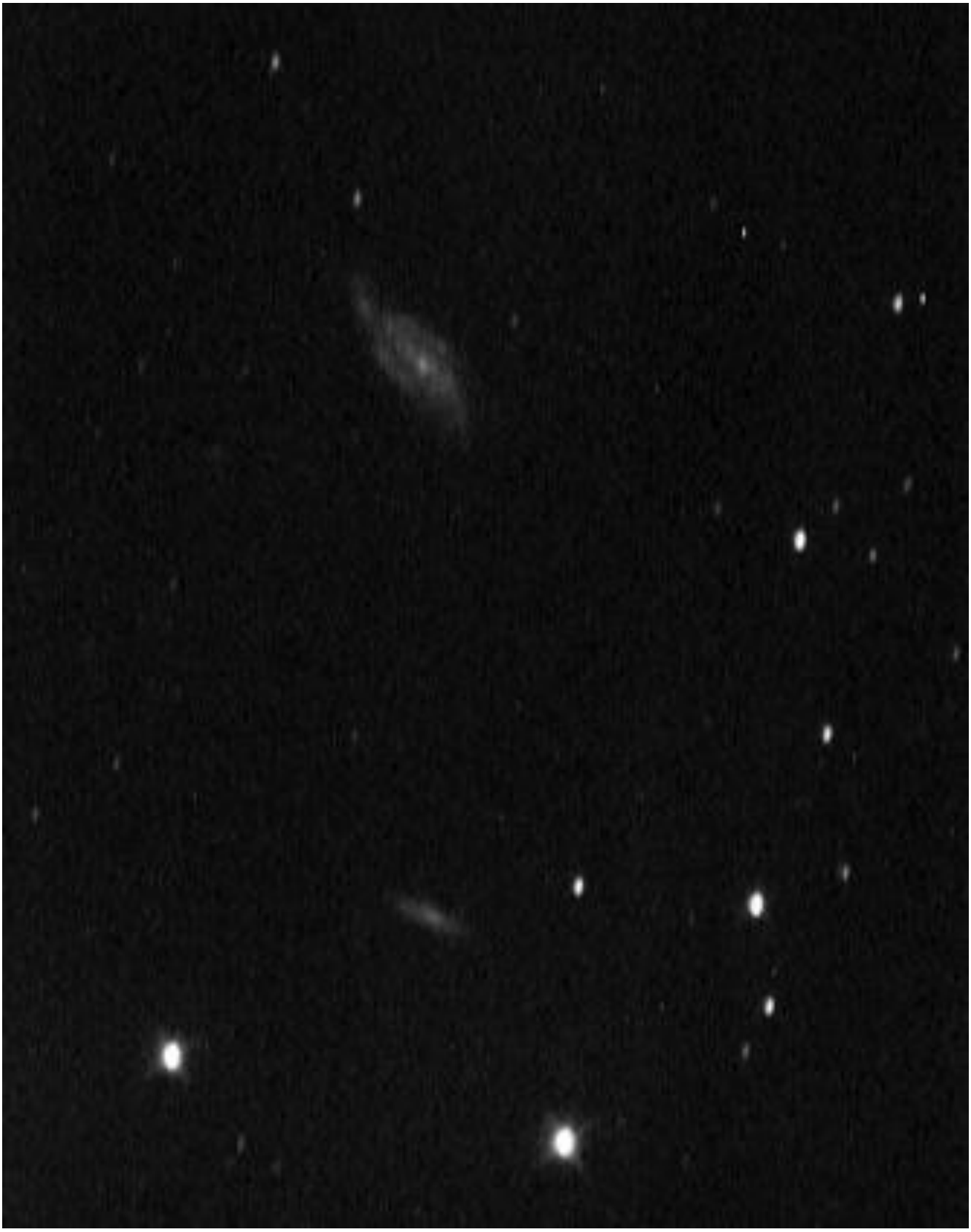
It is considered to form a physical pair with nearby spiral galaxy NGC 4085, and are both members of the M109 galaxy cluster. NGC 4088 is also cataloged as peculiar galaxy Arp 18, (Spiral with detached segments), and displays a number of prominent knots in its spiral arms.

NGC 4088 (H1 206) was discovered on the night of March 9th, 1788 by William Herschel using his 20- foot reflector, from his home at Slough near Windsor Castle. (NGC 4085 was discovered a year later on April 12th, 1789).

Video-Capture/EAA:

First video-observation: 06/04/2013, from the Cherry Springs Star Party at Cherry Springs State Park, PA, using a 6-inch RC optical tube @ f/5 on a GEM mount, with a CCD analog B/W camera and IR filter, 20-second single unguided exposure. (North is up in the cropped image) NGC 4088 is above center, while the much smaller and more highly inclined spiral galaxy NGC 4085 is below center.

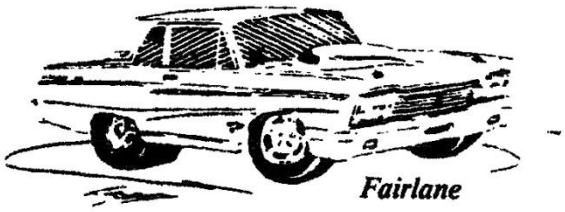
Second video-observation: 05/30/2022, from the Cherry Springs Star Party at Cherry Springs State Park, PA, using an 8-inch SCT optical tube @ f/6.3 on a GEM mount, with a CMOS color camera and broadband filter, 180-second guided exposure, live-stacked for 30 minutes. (North is up in cropped image) Dwarf spiral galaxy MCG 92092 in lower left corner.



Using EAA techniques: The odd-shaped inclined spiral stands out well from the star field. What appears to be a stubby, detached spiral arm with a bright H-II knot extends to the NW. A number of other bright H-II regions can be found in the tight arms to both the north and south of the oval core of the galaxy.

Mike McCabe: Observer from Massachusetts

Sketch and details follow.



Observer's Challenge, May 2023

NGC 4088, Galaxy in Ursa Major

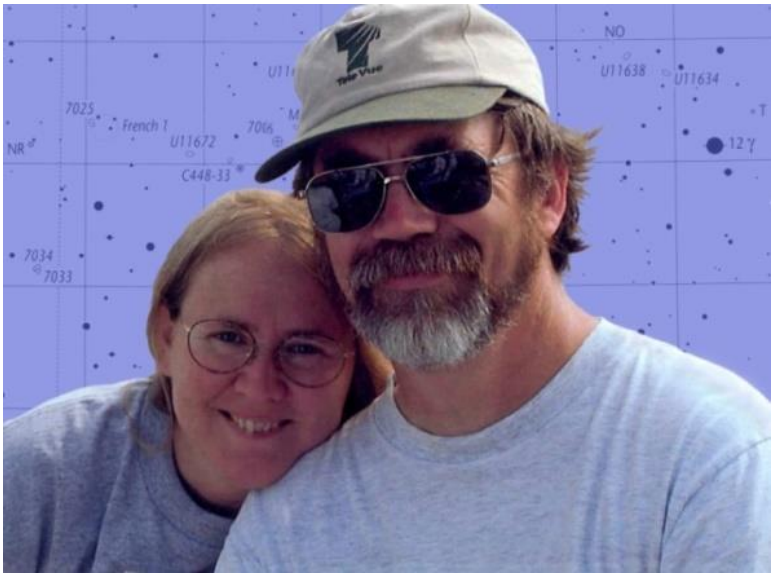
Observed on May 14th, 2023, 10" F/5 Newt/Dob

Viewing NGC 4088 proved to be a highly pleasurable observation, especially considering that at 11.2+ magnitude and with a surface brightness somewhere in the 13+ magnitude range, I wasn't expecting a whole lot from a 10" telescope. Even so, the galaxy's feeble glow from a distance of around 55 million light years seemed to find my eye with no problem. It was fortuitous that I was looking on this particular night, because most of the nights during this month were socked in with wildfire smoke which surely would have erased the galaxy from the view. Powers up to 140x were used to inspect the scene, and my sketch was made at a power of 52x with a true field of 1.3 degrees in the eyepiece view. My local sky conditions are not particularly conducive to extracting fine details from dim galaxies, thus none were seen.

41.98n, -70.90w

M.T.M.

Sue French: Observer from New York



NGC 4088 with SN 2009dd

10-inch f/6 Newtonian reflector at 192×
Seeing: fair
Transparency: good

North is up and west is to the right.

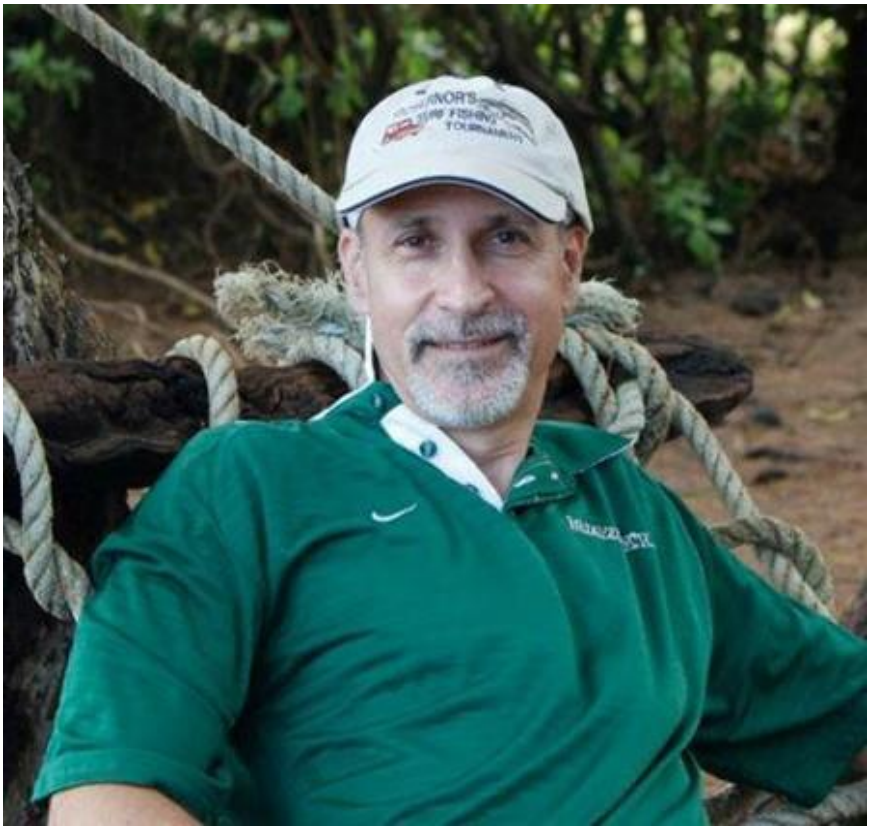
Mario Motta: Observer from Massachusetts

Image an details follow.

NGC4088, a galaxy about 51 MLY away, may be a barred spiral tilted to our line of sight.
It took 2 nights to collect the subs due to intermittent clouds.

I used RGB (1.5 hours), and LUM filters 75 minutes), then added Ha (30 minutes) as well for Ha nebulae regions. All taken with my 32 inch F6.5 telescope from Gloucester MA, and with ZWO-ASI 6200 camera. Processed in Pixinsight.

James Dire: Observer from Illinois



NGC 4088 is a spiral galaxy in the constellation Ursa Major The galaxy is 3.5 degrees south-southeast of the star Phecda. Phecda is one of the stars at the bottom of the cup of the Big Dipper, closest to the handle.

Magnitude estimates for NGC 4088 put it somewhere between 10.6 and 11.2. The galaxy is small in apparent size, 5.8 × 2.2 arc minutes. This size, along with its brightness, makes it easy to see in a 6 to 8- inch telescope. The galactic disk is elongated in the northeast to southwest direction.

NGC 4088 is given the galactic classification SABc. This means it is intermediate between a normal and a barred spiral galaxy with a small galactic bulge. The core appears slightly brighter than the galaxy's disk. NGC 4088 has two dominant spiral arms that are knotted. The arm extending to the northeast side of the galaxy appears disjointed. NGC 4088 appears in Halton Arp's Atlas of Peculiar Galaxies as entry number 18.

Three supernova have been observed in NGC 4088. The first was discovered in 1991 and the second in 2009. The most recent one occurred a year ago but never got brighter than magnitude 17.8; beyond visual detection with most amateur telescopes.

NGC 4088 lies about 50 million light-years away. It is a member of the M109 galaxy group. This is a large group of approximately 50 galaxies.

I captured NGC4088 in an image taken with a Stellarvue 102 mm f/8 Apo using a Televue 0.8× focal reducer/field flattener. I used an SBIG ST-2000XCM CCD camera. This camera contains a color imaging chip and an onboard guide chip. Everything was mounted on an Orion Atlas (EQ-6) German equatorial mount and the guided exposure was 90 minutes using 10-minute subframes.

The brightest star in the image is HZ Ursae Majoris, a pulsating, long-term variable star that fluctuates in brightness from magnitude 8.28 to 8.39. The faintest stars in the image are near magnitude 18.

The galaxy at the bottom of the image is NGC 4085. This is a magnitude 11.7 galaxy also classified as SABc, but seen more edge on than NGC 4088. It is 2.2 × 0.,6 arc minutes in size and is visible in the same eyepiece field of view as NGC 4088. It is also a member of the M109 galaxy group.

There are myriad faint galaxies in the image. They appear as faint, star-like objects. To distinguish them from stars, they are more blurry and not sharp circular points of light. The easiest to spy on the image is located to the lower left of NGC 4088, about one galactic major axis diameter away (6 arcminutes southeast of NGC 4088). This is 16th magnitude PGC38369.

Mark Helton: Observer from Massachusetts

Details follow.

NGC 4088, galaxy in Ursa Major

Imaged from Ipswich, MA with a Bortle 4/5

50 180 sec images at gain 100 -10 cooling bin 1×1
20 dark frames
25 flat frames
30 bias frames

Camera: ZWO533MCPRO no filter
Mount: Ioptron HEM44EC
Telescope: Celestron C-8 with .63 FF 1450mm f/7.1
Processed in Pixinsight and Photoshop

Really enjoyed imaging this target and the region around it. There are a lot of points in this image that are much further away than these galaxies!

Joseph Rothchild: Observer from Massachusetts

I observed NGC 4088 with my 10” dobsonian in dark skies on Cape Cod. It was easily located with a star hop from Gamma Ursa Majoris. It was visible in both 27 mm and 14 mm eyepieces at 53X and 102X respectively. The galaxy was indistinct and appeared spindle shaped with a ratio of about 3:1. I could not detect any internal structure.

Roger Ivester: Observer from North Carolina

NGC 4088 was much easier than galaxy NGC 3044, which was the April challenge object. However, NGC 4088 is still "extremely" faint. It has low surface brightness, highly diffuse and elongated. I could see this galaxy, but with difficulty despite a 4.8 NELM.

Since I was using my GoTo mount, for this galaxy which made it much easier. I used a three star alignment, rather than my normal two, which improves the pointing accuracy, and put the galaxy in the center of my FOV. I've found it much easier if I know an extremely faint deep-sky object is in the center of the field.

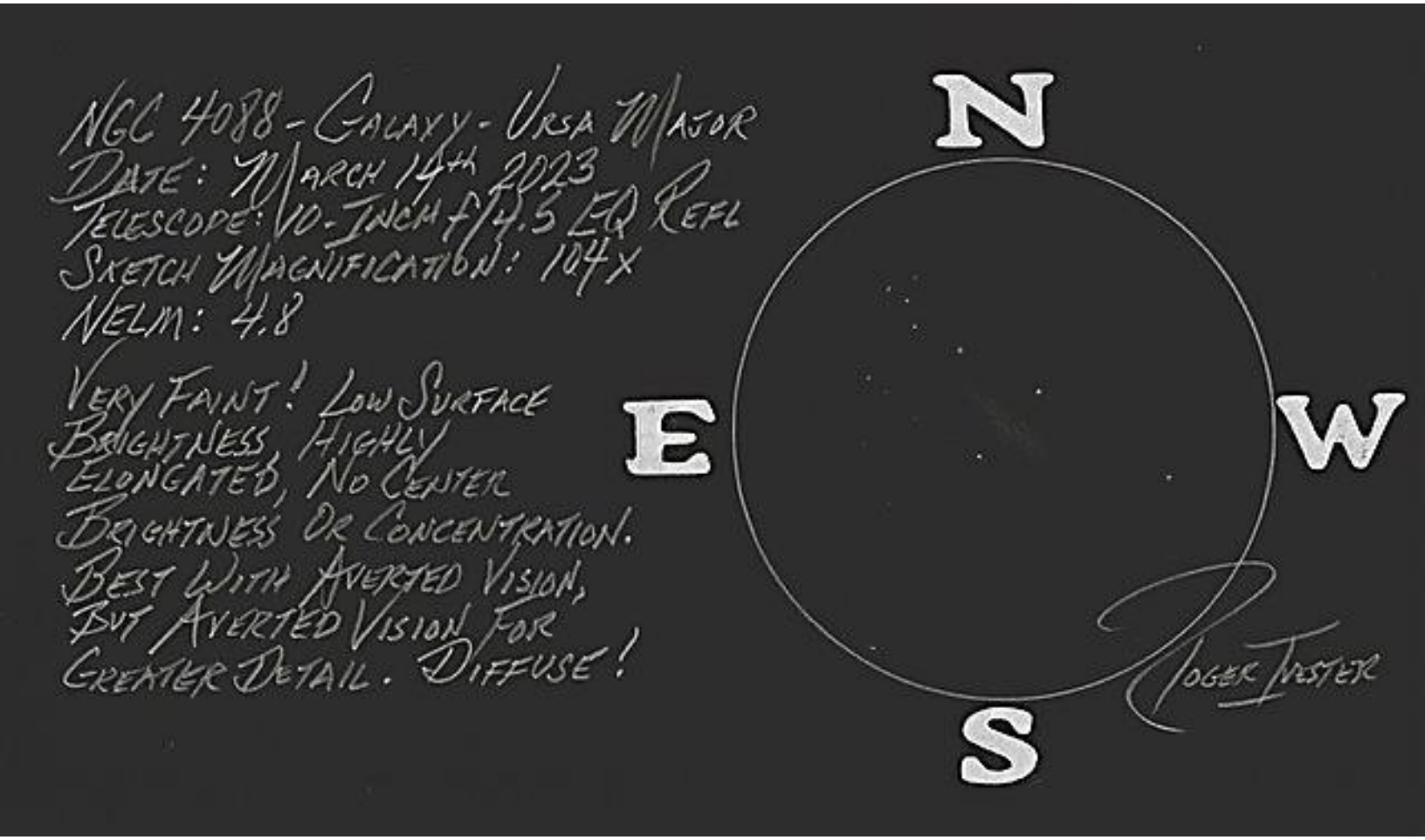
It was a cold night (March 14, 2023) and breezy, but with very low humidity. Years ago, this night might allowed me to see the galaxy much better and easier, but light pollution has increased in my suburban back yard over the past 40 years.

However, my observations prove, that even very faint galaxies can be successfully observed from a moderately light polluted city back yard. And it's been years since I took a telescope to a dark site.

I really like the convenience of observing from my back yard for obvious reasons. It's difficult for me to load a solid tube, very heavy 10-inch equatorially mounted telescope and with all supporting equipment, and driving to a dark site.

Yes, I have smaller telescopes, but the process of loading and unloading any telescope and equipment and driving 30 or more minutes to, and back from the South Mountains is still very time consuming and labor intensive.

Sketch Follows.



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

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