

MONTHLY OBSERVER'S CHALLENGE

Compiled by:

Roger Ivester, North Carolina

&

Sue French, New York

November 2023

Report #178

IC 10, Local Group Galaxy in Cassiopeia

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:

IC 10 was discovered by Lewis Swift on October 8, 1887 with the 16-inch refractor at Warner Observatory in Rochester. He described the field as showing a faint star involved in a very large, extremely faint nebulosity, extremely diffuse, in line with 2 stars of equal magnitude, which with a third forms a right angled triangle.

This dwarf is a member of the Local Group and is considerably reddened and dimmed by clouds of gas and dust in the plane of our Milky Way Galaxy.



Uwe Glahn: Observer from Germany



Object: IC 10

Telescope: 16" f/4,5 Newton

Magnification: 180×

NELM: fst 6m+

Seeing: III

Sketch follows

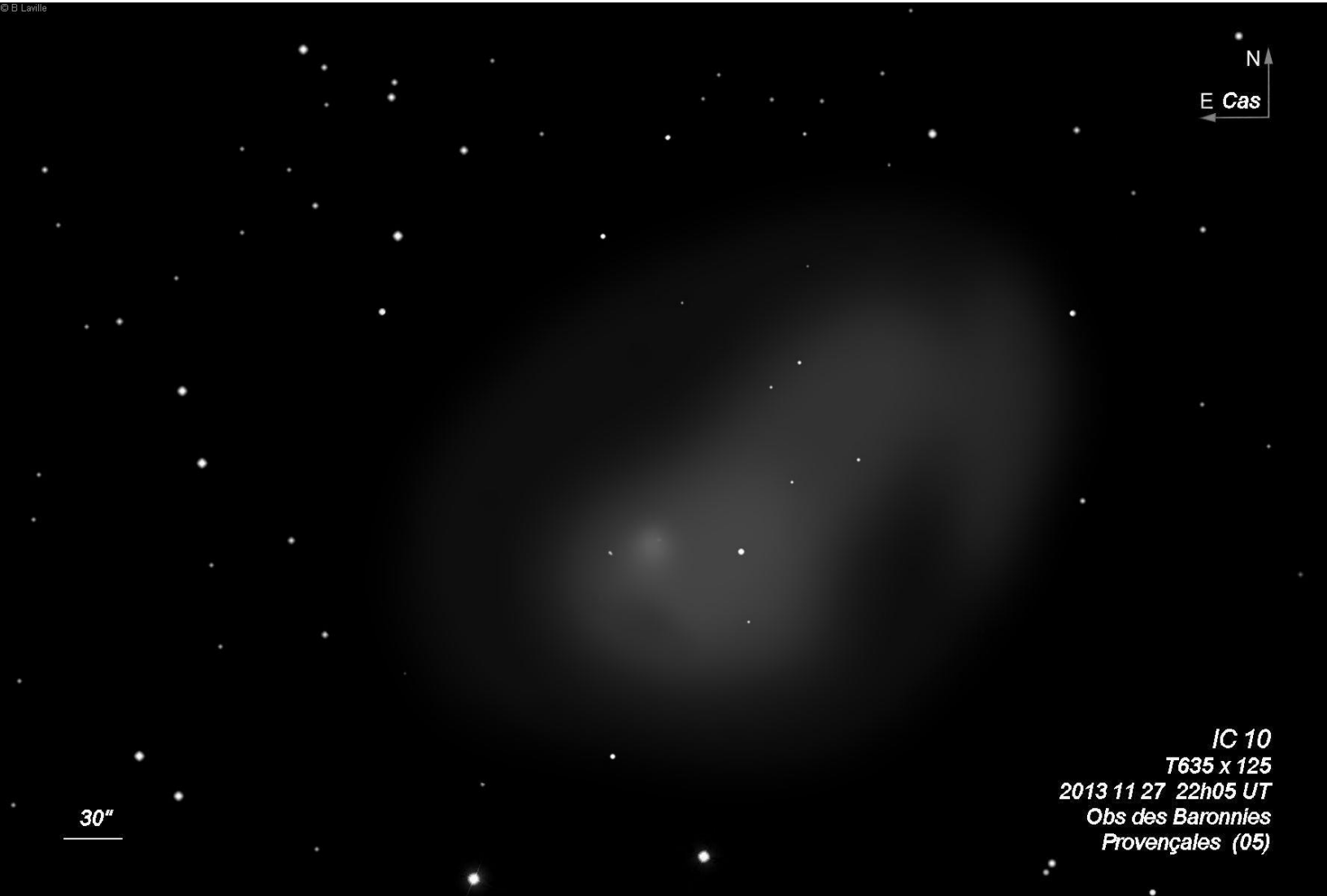


You can see more of Uwe's sketches at <http://www.deepsky-visuell.de/>

Bertrand Laville: Observer from France



© B Laville



30"

IC 10
T635 x 125
2013 11 27 22h05 UT
Obs des Baronnies
Provençales (05)

<i>Date of observation:</i>	Nov 27, 2013 10:05 PM UT
<i>Duration of observation:</i>	55 mins
<i>Object position:</i>	Alt: 62.5°, Az: 316.7°
<i>Observation location:</i>	Baronnies Provençales Observatory
<i>Instrument :</i>	TN 635 Dobsonian Obsession
<i>Main eyepiece:</i>	TeleVue Ethos 21mm
<i>Magnification</i>	148x

x125 ES 25/100 25mm:

The galaxy is faint, in a rich field. Its boundaries are very vague, and without regular shape: it could be a diffuse nebula.

x148 Ethos 21mm: The galaxy is better seen. The field is very rich; very many stars superimposed on the nebulosity, but of course, the galaxy is not resolved!

The form is difficult, but can be seen with averted vision 100 percent of the time. A spine gives the galaxy an elongated shape; this spine strengthens on the SE side. A luminous condensation, quite concentrated, is superimposed on a double star, difficult to separate on the L5 background. I only saw the dark cloudiness because I had previously recognized it in the photos.

You'll find further details and more of Bertrand's sketches at: <http://www.deepsky-drawings.com/>

Jaakko Saloranta: Observer from Finland

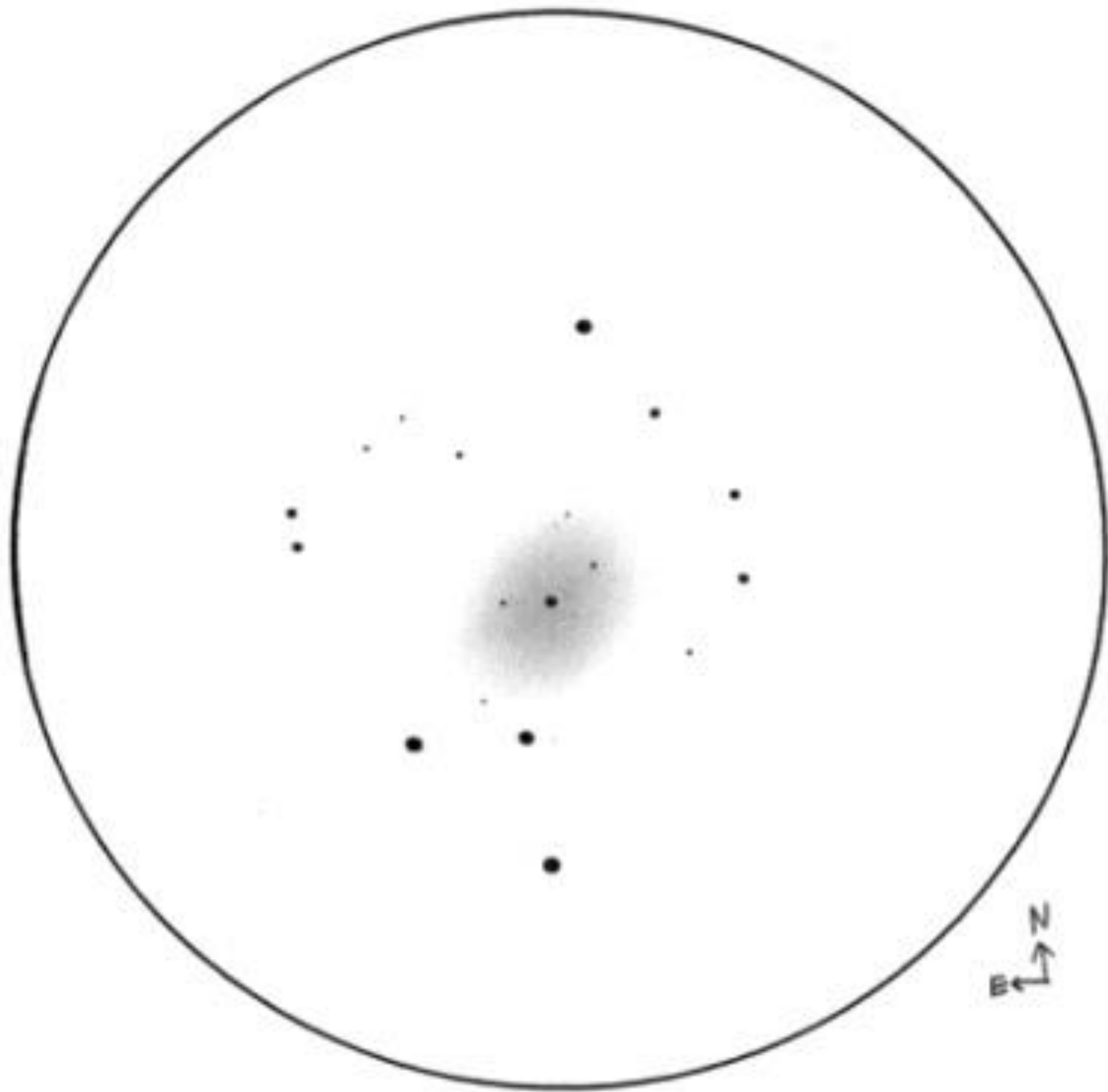


I remember IC 10 eluded my gaze for several years before I finally saw it by using my 8-inch telescope under rural Finnish skies. I tried to view it from my suburban backyard several times in the 90s but it simply was too faint.

Roger Ivester's nickname "The Invisible Galaxy" is very fitting for this pesky little thing.

No structure seen. Sky conditions were quite favorable that night: temperatures in the 40s, only moderate humidity, naked eye limiting magnitude of 7.2 and some faint aurora borealis visible low in the northern sky.

Sketch follows



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Larry McHenry: Observer from Pittsburgh, Pennsylvania

<http://stellar-journeys.org>



Galaxy IC 10 is located in the Fall constellation of **Cassiopeia** – “The Queen” and is about 1.5° from the bright 2nd mag. star Caph (Beta Cas). Due to its location, IC 10 is somewhat obscured by the Milky-Way.

IC 10 is classified as an Dwarf Irregular galaxy type and is about 2 million light years distant, and with a diameter of about 5,000 light-years across. IC10 is a member of the Local Group galaxy cluster which the Milky-Way belongs to.

IC 10 was first discovered in October 1887 by amateur astronomer Lewis Swift using the 16-inch Clark refractor at the Warner Observatory in Rochester, NY. Swift described the object as: “*a faint star involved in a very large, extremely faint nebulosity, extremely diffuse.*”

EAA-Capture: 09/11/2023, from Cherry Springs State Park at the BFSP in Western Pennsylvania.

Using an 8-inch SCT optical tube @ f/6.3 on a German style equatorial mount, with a CMOS color camera and broadband filter.

180 second exposure, live-stacked for 45 minutes.



The galaxy is a dim oblong semi-oval shape, but has a bright region of several identifiable OB association star clusters, H-II regions and several dust lanes.

Mike McCabe: Observer from Massachusetts



I really enjoyed this month's challenge. Not so much the observing end of it, however, your suggested name, the "Invisible Galaxy" is absolutely fitting, but rather the research and learning end of things. This target proved to be very interesting as I dug deeper on information about it. Once again, the challenge has exposed me to a target that would've likely remained anonymous to me had I been left to my own devices.

The target was very difficult to see indeed, and had it not been for a friend bringing out his 18-inch Newtonian for an observing session, it would've likely gone unseen by me under my mid-4 NELM skies.

One attempt with a 120mm refractor and two attempts with a 10-inch Dobsonian stirred up nothing in the way of a galaxy sighting in the area, but the 18-inch pulled it out. How about some bright open clusters for a change? My skies stink, and this dim stuff is hard from around here! ☺

So here's to the challenge bringing the challenge...

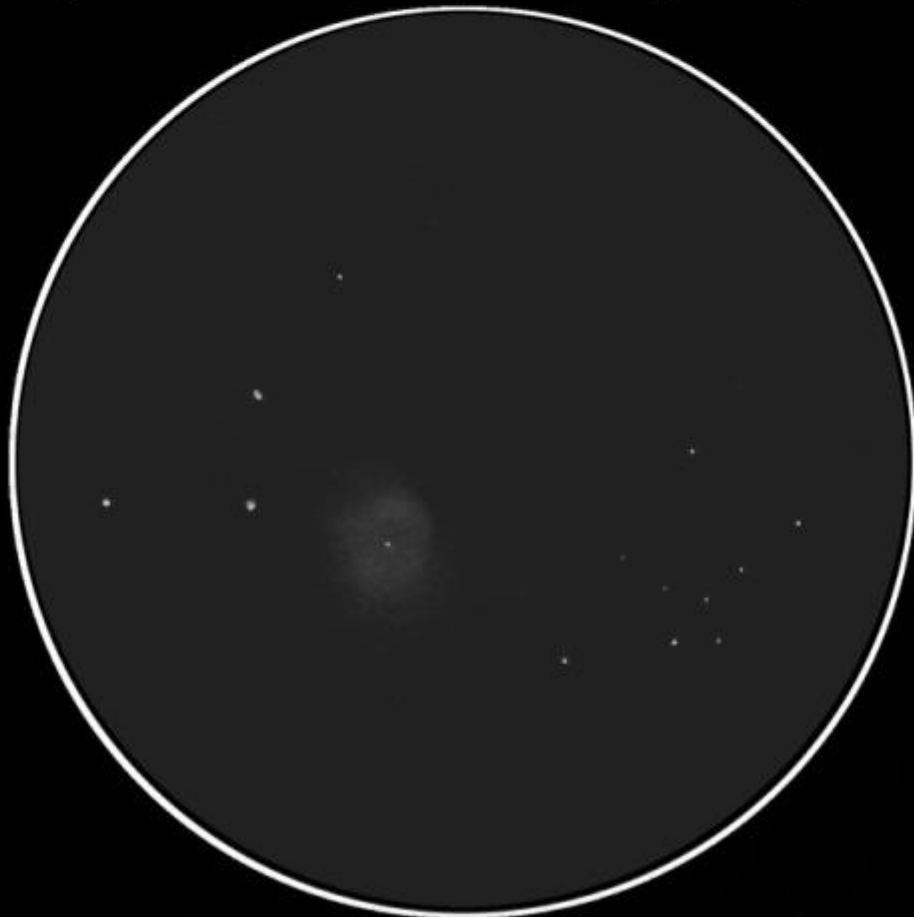


November 2023 Observer's Challenge
IC 10, Irregular Dwarf Starburst Galaxy in Cassiopeia

Observing attempts; Oct. 11, 120mm refractor. Nov. 2 and 7, 10" Newt/Dob.

Starfield sketched through the 10" on Nov. 2 @ 278x. No galaxy was seen during the first three attempts.

Final attempt; Nov. 11, 18" Newt/Dob under a Bortle 6/7 sky (4.3 NELM). The galaxy was visible as a ghostly apparition, mostly surrounding a 13th mag. star situated just north of the 10/11th mag. triangle of marker stars.



IC 10 - LBN 591 - PGC 1305 - UGC 192 - vMag: 9.5 - SB: 12.7

Mark C. Helton: Observer from Massachusetts

Scope: Stellarvue 102T-Raptor

Mount: Ioptron HEM 44EC

Camera: ZWO 183 MC pro

Filter: Antila Triband RGB 2 inch

Guide scope: Orion 60mm

Guide camera: ZWO 174 MC

21 subs at 600seconds each

Software for control and capture: NINA

Software for processing: Pixinsight, and Photoshop

Images are from the Great Neck Observatory on [Astrobin.com](https://www.astrobin.com)



John Bishop: Observer from Massachusetts



On November 2, 2023, I observed IC 10, an irregular galaxy, also known as a starburst, or blue compact dwarf galaxy, located in Cassiopeia. I used my 8.25 inch f/11.5 Dall-Kirkham reflector, a portable setup on a motor driven equatorial mount, without go-to. Observation was from the ATMoB Clubhouse in Westford, Massachusetts. Conditions were clear and steady at sunset, which was at 5:38 pm. I had a limited observing window for this faint object, because the 78% illuminated moon was rising at 9:07 pm. Things looked even more iffy when thin, patchy clouds rolled in at about 8:00 PM. Fortunately, I had polar aligned the scope; it was locked onto the target location, so I could readily view the FOV when the sky was clear.

This object was new to me. Luginbuhl & Skiff assign it a visual magnitude of 10.3, with a surface brightness of 13.5. To locate IC 10 by star hopping, I started at Beta Cassiopeia and oriented myself, to the field shown in the Interstellarum Deep Sky Atlas. In my 7×50 finder scope, I could see two 8th magnitude stars that roughly point to IC 10.

Based on the chart, I centered the finder on my estimated position for the galaxy, and then scanned the FOV in the main eyepiece at 48x. I saw field stars and deep space, but no galaxy. I then increased the magnification to 100x and scanned the field, using averted vision. Soon I saw a small, faint glow in the corner of my averted eye. It was just off the long leg of a triangle of stars, not shown on my charts, which I subsequently learned is a landmark for locating IC 10. The glow (more like a brightening) disappeared when I looked at it directly, then reappeared with averted vision. A feeble point of light then appeared in the middle of the glow. At that moment, I thought I might be looking at just a very faint star, scattering light in some nebulosity.

I increased magnification to 200×. The hazy patch was larger and slightly more visible. It was evident that this was IC 10. Several fellow observers confirmed they saw it in my scope. The galaxy was so faint and

diffuse that none of us could assign a shape to it, other than to say that it was elongated and irregular. I would not have taken IC 10 for a galaxy if I happened to come across it, but rather a nebula. In fact, Russian astronomers in 1951, misclassified IC 10 as a nebula. (*Sky & Telescope*, December 2023, pp. 57-58).

I assume the “point of light” I saw was the star Luginbuhl & Skiff describe as magnitude 13.5 in the “Observing Handbook and Catalog of Deep-Sky Objects.” My memory is that I saw two stars in the nebulosity; the second was slightly fainter than the first. Unfortunately, I neglected to mention this second star in my field notes. Again in the “Observing Handbook.....” the second star is listed as magnitude 14.5. This would be at the limit of visibility in my 8.25-inch scope. Several of us who observed IC 10 discussed whether these are foreground stars. Luginbuhl & Skiff seem to imply that at least the fainter one is not, “photographs show that the fainter star on the E side may be an H-11 region.” p. 62).

IC 10’s irregular shape had been attributed to “galactic obscuration.” Radio observations then showed that no major portion of IC 10 is obscured (i.e., as to its shape). It is truly an irregular galaxy. IC 10’s light, however, is subject to “foreground extinction” by gas and dust in both the Milky Way and IC 10 itself (as much as 3 magnitudes) again, “*Sky & Telescope*” December 2023, p. 58).

Sue French: Observer from New York



IC 10 Cas

(Local Group?) Gx^①

0^h20.3^m +59°18' U18L

9-24-04 4:05 am EDT 10" f/6 Newt (DJ) Seeing: good Transparency: good
35mm Panoptic: Easily visible glow at the N end of a 12' long chain of
mag 7-12 field stars trending SW-NE. The galaxy is patchy and $\sim 2\frac{1}{2}'$
long with a mag 13 star in edge SSE of center. 13mm Nagler: A
fainter star sits at the edge N of center. There is a triangle of mag 10-11
stars south of the galaxy \rightarrow its two western stars + the mag 13
star + the northerly star make a shallow \sim N-S arc. Another star
1' SSW of the northerly star lies along the side of the galaxy
that faces SW. Galaxy NW-SE $\sim 3\frac{1}{2}'$ long and brightest in the
SE part. The bright part has a non-stellar spot that lies almost
1' east of the mag 13 star. Another such spot lies close SE of
the northerly star.

12-5-04 9:14 pm EST 105/610 mm Apo 7mm Nagler S: fair T: fair
There's a very faint star at W end of a little patch of fuzz maybe
1' across. With averted vision, this in turn looks like it's within
a larger, elusive, extremely faint haze. $\sim 2'$.

11-14-12 8 pm EST 130/819 mm apo Seeing: good Transparency: fair
17mm Nagler: visible with averted vision
as an extremely faint, very low surface
brightness, small patch roughly $1\frac{1}{4}'$ across
with faint star at east edge. Sketch.
13mm Nagler: Easier but still averted.
A little larger looking. 7mm Nagler:
The brightest part, west of the faint
star, is barely visible with direct vision,
but best with averted. A bit patchy.
The faint star is how embedded. Somewhat elongated east-west.
About $1\frac{3}{4}'$ long.

Mario Motta: Observer from Massachusetts



I enjoyed imaging this galaxy, as it is one of the closest galaxies to earth, about the same distance as Andromeda, 2-3 MLY away. The galaxy is partially hidden by the winter Milky Way in Cassiopeia. A small irregular galaxy that happens to be going through a starburst phase, as evidenced by the red HA regions. This galaxy is also surrounded by a very large neutral hydrogen gas halo.

The following image was made using my 32-inch telescope, and ZWO ASI 6200 camera.

Taken with 1 hour lum, 45 minutes each of RGB, and 50 min of Ha imaging (to highlight Ha regions) for a total integration time of about 4 hours.

A very fascinating object...for sure.

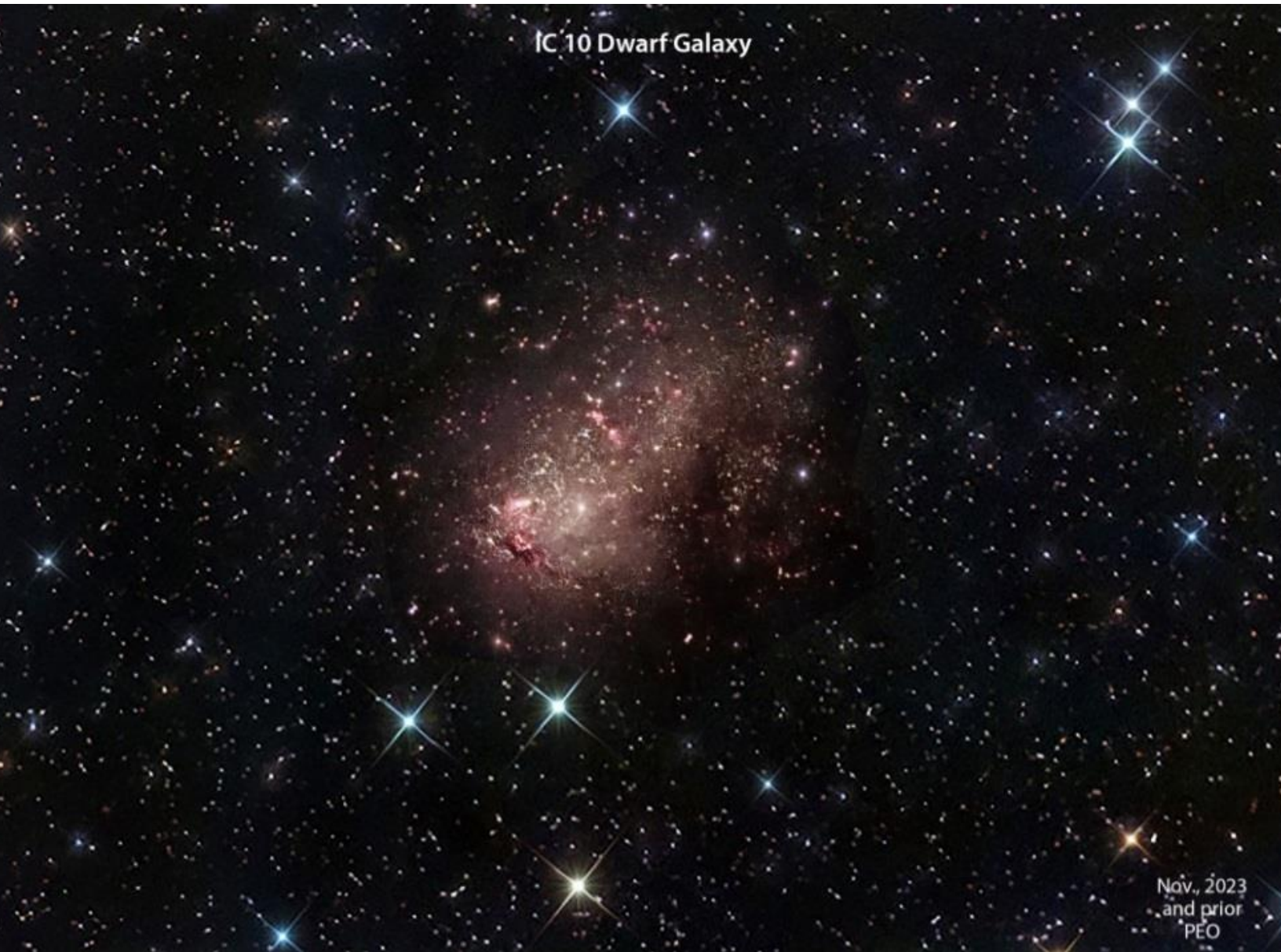


Phil Orbanes: Observer from Massachusetts

IC 10 is a faint irregular galaxy of the Local Group, about 2-3 million light years away.

It is located very close to the star, Caph in Cassiopeia.

My RBGHa photo includes about 17 hours of imaging with my 14-inch Planewave reflector and FLI 16803 CCD camera.



Roger Ivester: Observer from North Carolina



Telescope: 10-Inch f/4.5 EQ Newtonian

Sketch Magnification: 142x

FOV: 0.46

NELM: 4.8

So during the months of October and November 2023, three observing sessions and more than six-hours at the eyepiece, I was finally successful in seeing this galaxy.

So by own authority as an amateur astronomer, which is no authority, I'm naming this galaxy: "The Invisible Galaxy."

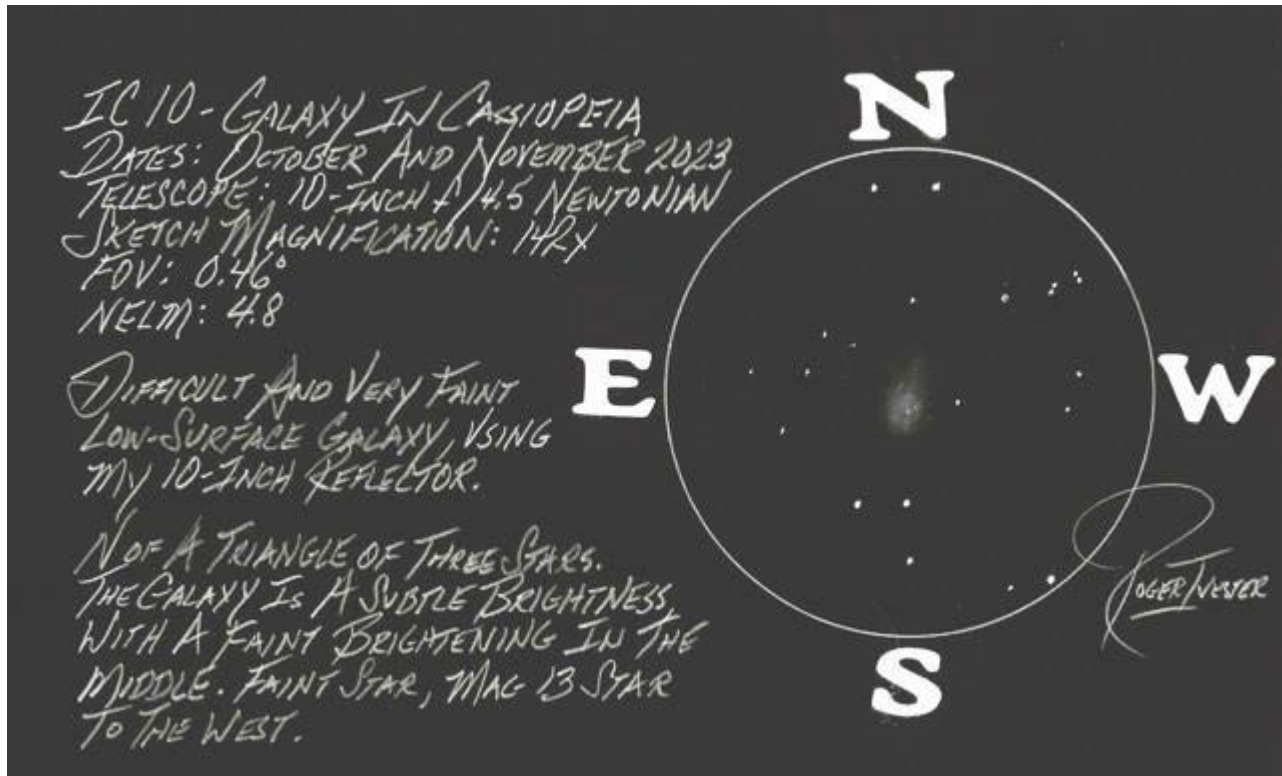
A difficult and very faint low-surface brightness galaxy, using my 10-inch Newtonian. After three nights with poor transparency, and more than six-hours of observing I was finally about to make my final sketch, as following.

The first thing to look for is a triangle of three mag. 9 stars, with the galaxy being just to the N.

The galaxy appears as a mere brightening in the sky, but upon careful observing over the three nights, the glow of the galaxy halo became enlarged, and elongated NNW-SSE.

There is an extremely faint, and very subtle brightening in the middle. A faint star is visible near the center and a mag. 13 star is fairly easy to see just to the W.

In the following sketch, note the pair of faint and close double stars in the NW edge of the field.



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

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