

Reiland 1 Observing Report

By Mike McCabe

During the summer of 2020, it was brought to our attention by Roger Ivester that we may want to consider observing an obscure open cluster identified as Reiland 1 and located in the constellation Cepheus. Discovered in 1985 by amateur astronomer Thomas Reiland, this dim, compact grouping of stars is nestled in a cloak of nebulosity, and has actually been the subject of advanced research* as part of a study on the reliability of open cluster parameters.

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This challenge intrigued me, and I immediately sat down to produce a set of charts intended to be used in the month of October when Reiland 1 would be in a good place in the early evening sky. In the meantime, fellow amateur astronomer Mario Motta produced an image of the subject using his observatory-mounted 32" reflecting telescope, and put forth the prediction that this will likely be a challenging object for visual observers based on the small size and dim magnitude of it. This set a general tone of difficulty for the task at hand, but as in all things we do in life, you don't really know until you try it for yourself.



The Motta image of Reiland 1, including nearby IC1470 (top) for comparison.

For the star hopper, the road to Reiland 1 is one full of rich celestial treasures. Like any great road trip, one picks a starting point and chooses a route, and hopefully along that route there will be many scenic overlooks where one can stop and enjoy the beauty of nature. The path I chose was entirely befitting of a fulfilling scenic tour.

Beginning at Caph in Cassiopeia, it's just a short hop in a southerly direction to Rho Cas, a 4.5 magnitude yellow hypergiant located about 11,000 light years distant from us. That's good, because at 500x the radius of the Sun, if Rho Cas were to replace it we'd be looking at the obliteration of everything out to Jupiter and likely beyond that. Yikes!

A tiny jog to the east lands us on NGC 7739, aka Caroline's Rose cluster. One of fourteen independent discoveries by the sister and faithful assistant of the legendary astronomer William Herschel, NGC 7789 is a wonderfully delicate and beautiful gathering of stars that gets its name from the flowery appearance it takes on when photographed. This is truly one of the finest open clusters in the heavens.

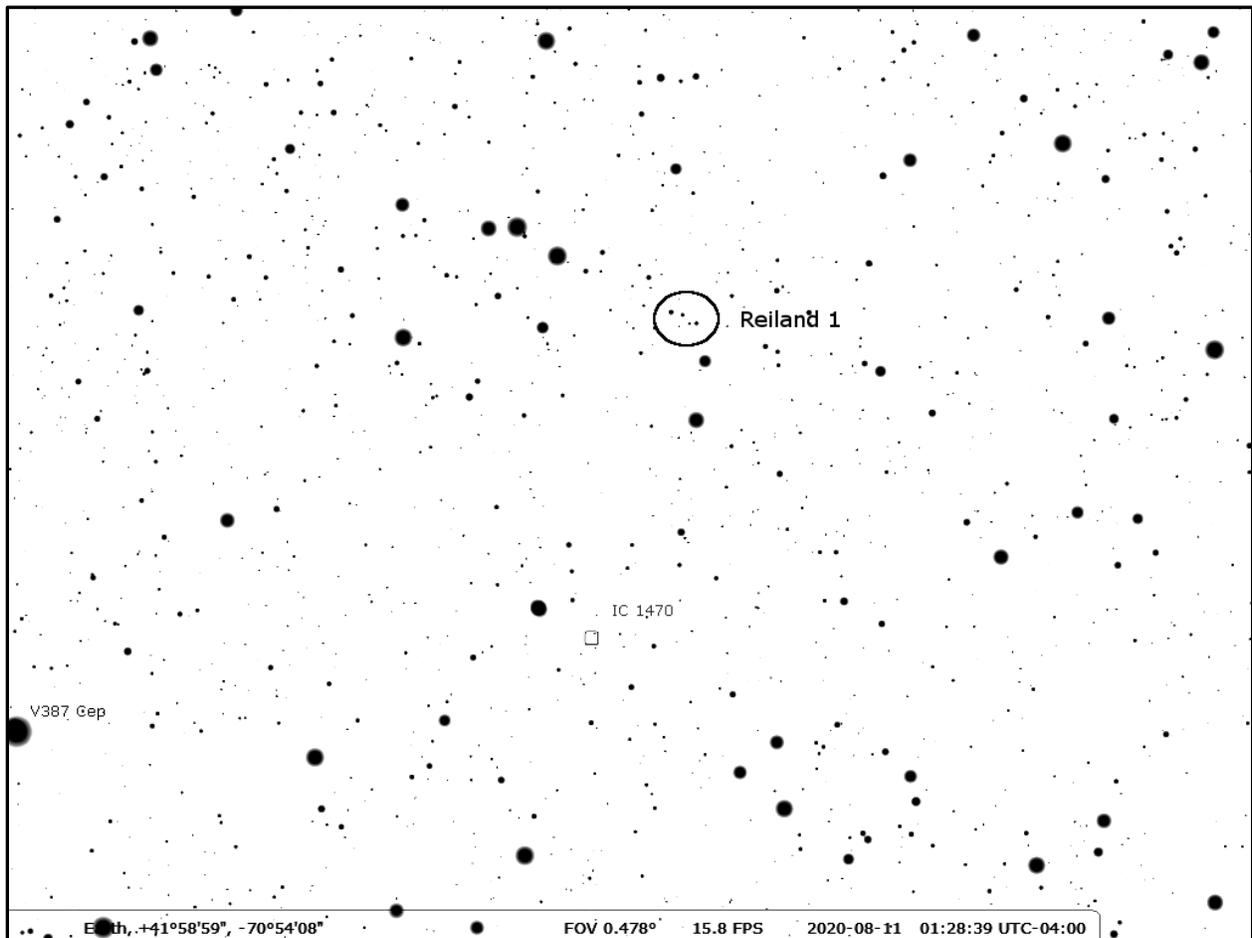
Now with a push to the west, we land on another fine open cluster, that of Messier 52. M52 actually comes in at about .2 magnitudes dimmer than Caroline's Rose, but at about half the apparent size (16' vs. 30') its compactness lends to it what appears to be an increase in brightness, which isn't real, but just feels that way due to the rich field of stars clumped into a smaller space.

Turning back south, we now enter the constellation Cepheus and happen upon another wonderful open cluster treasure, NGC 7510, aka the Little Jewel Box. Compact at just about 7' on the long side, this wonderful arrangement of relatively fewer stars than our previous stops truly does sparkle like a diamond necklace on display in a jeweler's showcase.

With a final small push just a little further to the south, we're now in the neighborhood of Reiland 1. By comparison it's like leaving Las Vegas and heading out into the desert. Things are a bit barren here, with just a few dim stars populating the field of view. But this is where our quarry lurks, so we'll prepare our equipment accordingly and get on with the hunt.

Taking Mario's assessment (small and dim) to heart, I didn't even bother with a low-power scan of the area. When I prepare my chart sets, I typically make three sheets; one wide-field (about 60*) showing the general area of the target, one finder chart (about 10*) plotting a path from a guidepost star to the target, and

one eyepiece chart (anywhere from .5* to 2*+ depending on the target). In the case of Reiland 1 my eyepiece chart spanned just under .5*, and because Reiland 1 isn't typically listed in most planetarium programs I added a way of identifying the star cluster by means of circling and labeling it.



My eyepiece chart for Reiland 1. Credit: Stellarium, with additions by the author.

I swapped out eyepieces so that I was now working at a power of 208x, and after a few minutes of slowly moving around and trying different chart orientations (it's never as straightforward as just looking at the chart right side-up) I finally got a handle on the starfield. To my surprise, the nebulosity cloaking the little asterism of 4-5 stars was readily apparent. No, it wasn't 'Orion Nebula' apparent, but it wasn't that hard either. I've dealt with much worse from this driveway over the years. NGC 925 comes to mind – nearly invisible. Another would be Barnard's Galaxy – that's averted imagination from my area. But Reiland 1 was definitely there in the eyepiece. The stars were barely discernible with direct vision but improved with averted vision, and the nebulosity behaved the same – discernible with direct vision but better with averted. It was time to dump the charts and pick up the sketching equipment.

My sketching tools include a formatted log sheet printed on regular copy paper, a couple of #2 pencils, a piece of medium charcoal, a White Pearl eraser, and a custom-made red flashlight. I mention the custom-made flashlight because I've found that the majority of commercially marketed astronomy-specific red flashlights are way too bright for use when observing dim subjects. The one commercially available light I own that can be adjusted to an appropriate dimness has two LED's that throw distinctly overlapping beams on whatever it's aimed at, and I find that too distracting when I'm trying to sketch.



How to easily make an astronomy-specific flashlight – Take an inexpensive LED flashlight and put two or three layers of red construction paper over the lens (tip – test how many layers are necessary for your particular light by bringing the light and a chart into a darkened room or closet in your house) and secure them with standard cellophane tape. The end product will be just bright enough for reading charts and sketching without compromising your dark adaptation, and they throw an evenly illuminated beam to boot. These lights can be bought by the dozen online for very little cash – batteries included!

PS – the picture makes it look much brighter than it really is.

When I make my sketches I usually like to start by plotting the brightest field stars first, then the subject of the sketch, while adding dimmer stars as I work and they become apparent to me. For nebulous regions I typically take either a pencil or a piece of charcoal and pile of bunch of the medium onto a spare piece of paper or

on an unused area of a chart, then I rub my fingertip into the material and use that to transfer it onto the sketch. This gives the nebulosity a more natural look but often results in overdoing it. That's where the eraser comes in handy.

OBSERVATION LOG - OBJECT: REILAND 1

DATE 10-14-20 /z TIME 19:55 /z EDT LOCAL OBSERVING LOCATION 42N 71W

SCOPE/APERTURE 10" F/5 NEWTONIAN

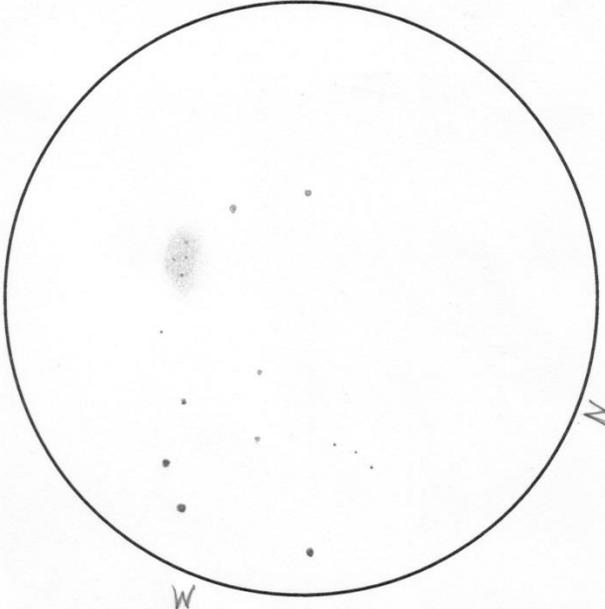
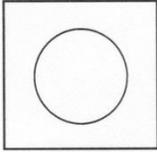
EYEPIECE 6mm MAGNIFICATION 208x

FILTER — SEEING 2/5 TRANSPARENCY 2/5

TEMP 58°F BARO PRES. — WIND CALM

COMMENTS: .29° TFOV

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NEBULOSITY MORE EVIDENT
THAN ANTICIPATED.

ORIENTATION AND/OR ROTATION

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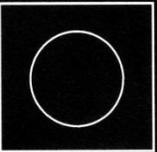
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My Reiland 1 sketch as it emerged from the scanner and after inverting.

More about Reiland 1

Searching online I was able to find precious little information about Reiland 1, even in this day of vast amounts of information at our fingertips. It appears that the amateur community is largely unaware and/or uninterested in it, and it is only briefly mentioned in the professional realm.

As for the amateur community, I got exactly one hit when searching 'Reiland 1' and that was for an observing report submitted by an unknown amateur astronomer located in Finland. In his notes he describes the target as 'easy', and provides a sketch done through the eyepiece of an 8" Newtonian telescope.

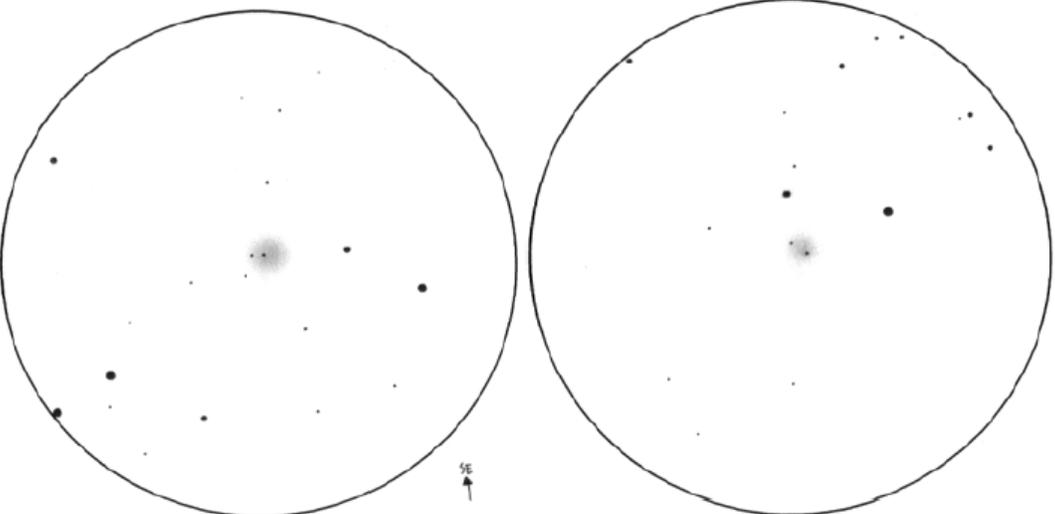
8" Orion SkyQuest

Object: Bergeon 1 Obs. place: Rajakylä, Vantaa, Finland Date: 13./14.11.2004 NE Lim.mag: 5.7^m Background sky: 3-4

Seeing: 2 Weather: +2.5°C, some clouds. Original field notes: Esy, * mags 13....14, ~3* + haze.

Description: Very small, but bright group of stars mags 12...14. Three stars resolved within the haze. It is uncertain if the background glow is from the fainter members or of some actual nebulosity (no filters were used). There's also another nebulous cluster in the area (yet this is clearly more challenging, but of same size); 6' E from IC 1470 with 2 stars resolved with some very faint haze on the background. @ 122x, three different nebulae can be discerned. Altitude of object: ~83°.

Notes: Reiland 1 = open cluster, rediscovered in 2003 = [BDS2003] 38. The second object = GM 1-79 = reflection nebula. GM 1-79 [1977] rediscovered <2003 = Kronberger 23 (DSH J2305.9+6015)



Reiland 1 (left) / GM 1-79 (right)
Both drawn @ 200x using 8" SkyQuest. SE up.

An observing report for Reiland 1 made by an unknown author, found online.

Reiland 1 was the subject of a small piece in a larger professional study titled *A Comparative Study on the Reliability of Open Cluster Parameters*, published and reviewed in 2015. In this study the authors strive to standardize what defines the various classes of open clusters throughout the Milky Way galaxy.

In work done by astronomer Nina Varsili Kharchenko et al. 2013 using 2MASS data, it was determined that Reiland 1 does not fit the data for an open cluster, so is just a chance arrangement of stars that form an asterism.

The 2MASS results by B11, in general, show the best agreement if we also consider the visual region. For example, it is the only work that identified the red giant clump in the CMD of NGC 2489. Also, for NGC 2627, the parameters fit best in the visual. Their isochrone fitting approach is comparable to that by T08 (oriented to the bluest, brightest stars), but apparently is not as strict as that done by T08, resulting in a better agreement in the visual CMD. However, there are also some results that do not fit correctly (e.g. NGC 2158 or Trumpler 14). Some objects were investigated by B11, but were excluded in the larger survey by K13. For example, K13 note for Reiland 1 that it is a compact asterism. Furthermore, B11 includes IC 2156 and IC 2157, but, according to K13, IC 2156 is either a clump in the corona of IC 2157 or an asterism.

In this excerpt from the document A Comparative Study on the Reliability of Open Cluster Parameters, I've highlighted the single mention of Reiland 1 that I found in the professional realm. 'K13' stands for Kharchenko et al. 2013.

And finally, there are those that just adopt objects as their own because they can. Whether or not he knows that Tom Reiland is the original discoverer of the subject of our focus, amateur astronomer Joe Bergeron has decided that his name looks better on it and so has designated it as Bergeron 1, where it graces the top of his personal list of 110 deep-sky favorites.

The Bergeron Selection (BS)

Joe Bergeron's List of Favorite Obscure Deep-Sky Objects

There's a minor fad of amateur astronomy personalities tossing together a list of 110 deep sky objects (some of which they may have actually seen), slapping their name (or some part of it) on it, and then publishing it as their own personal "catalog." Well, why should I be left out?

Permit me to present the **Bergeron Selection**, or BS List. Why not the "B" list? You see, Edward Emerson Barnard already thoughtlessly used that letter for his catalog of dark nebulae or whatever. That means I'm stuck with a lot of BS. Brian Skiff, when you get around to making your own catalog, you'll just have to pick some other letters.

I'm not the ferret of thousands of deep-sky objects that some observers are, but I have seen and recorded over 800. Here are a few of the prettiest or most intriguing of the lesser-known objects I've looked at. Most were observed with a 6" telescope, and none are terribly challenging (except for Bergeron 1).

BS #	Other Catalog #	Con.	Description
1	Bergeron 1	Cep	Minute, elongated clump of stars some 10' south of IC 1470. See Uranometria 2nd Edition, Chart 18. Heh.

In this screenshot from Bergeron's website, he explains the logic behind his list of objects, cropped here to include just #1 – that's Reiland 1, Joe!

And that's what I have to share with you about Reiland 1, a curious little gathering of stars in the constellation Cepheus. Hope you enjoyed it!

Mike McCabe

