MONTHLY OBSERVER'S CHALLENGE

Las Vegas Astronomical Society

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March 2012

NGC-2362 – (Caldwell 64) Open Cluster (Tau Canis Majoris Cluster)

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.

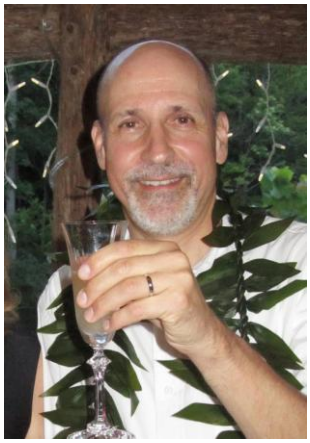
NGC-2362 – (Caldwell 64) Open Cluster (Tau Canis Majoris Cluster)

NGC-2362, also known as Caldwell 64, is a rare gem of an open cluster, easily identified by the dominant bright star at the center. It was first discovered by Giovanni Batista Hodierna sometime before 1654. The cluster sits behind the bright star Tau Canis Majoris so it is often called the Tau Canis Majoris Cluster. It's a relatively young cluster, around four to five million years old and contains a mass of about five-hundred solars. Associated with the massive nebula Sh2-310, they lie about the same distance. However, the nebula is more of a photographic object. There doesn't seem to be any correlation to the cluster and Tau Canis Majoris except alignment from our perspective.

With an apparent magnitude of 3.8, the cluster is well within reach of even the smallest telescope. Of course, the larger the aperture, the more stars will pop out and the more details will become available.

Observations/Drawings/Photos

Dr. James Dire: Observer from Hawaii



NGC-2362 is an open star cluster in the constellation Canis Major. The cluster is mag. 3.8 and is 5.0 arc min in diameter. It can be found 2.75º northeast of the mag. 2 star Wezen. The cluster owes most of its' brightness to the mag. 4.4 star Tau Canis Majoris. Tau is a five-star system with the two brightest stars, Tau A and Tau B, having mags. 4.9 and 5.3, respectively. The pair are separated by 0.15 arc sec. Tau A is a spectroscopic binary with a 155 day period. One of those two is an eclipsing binary with a 1.28 day period. Thus Tau A is a triple star. A mag. 10 star orbits the Tau A and B pair and is 8 arc-sec away. All of the Tau A and B system are thought to be massive O-type stars. The eclipsing binary pair are only 0.1 AU apart, the spectroscopic companion about 10 AU away, while Tau B is at 223 AU and completes one orbit per year around the Tau A trio. The mag. 10 star is 13,000 AU away and close encounters with other cluster stars will eventually pull it out of orbit.

There are around 60 more stars in the cluster, many young O and B stars. The cluster lies 4,800 light years away and is thought to be relatively young, around 5 million years. This is the same age as the island of Kauai, where I live.

I viewed the cluster with two telescopes, a 70 mm (2.6-inch) f/6 refractor and a 10-inch F/10 SCT, under dark Kauai skies. Both views where very different. When I looked directly at the cluster in the 70 mm (2.6-inch) at 35X, all I could see was Tau, as it overwhelmed the remaining stars. However, when using averted vision, the fainter stars in the cluster popped out forming a halo around Tau, which didn't appear to be as bright. Moving my eye back and forth, I could make the cluster and Tau blink on and off. The effect was very similar to viewing a planetary nebula with a bright central star.

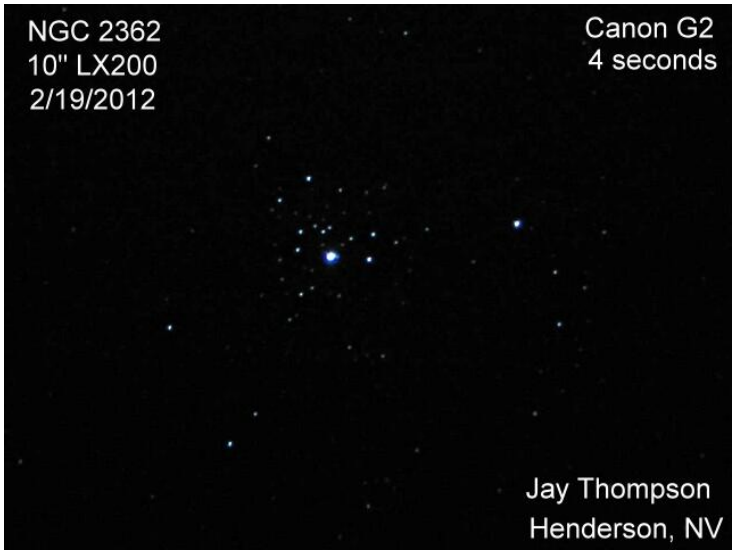
In the 10-inch at 97X, the entire cluster was resolved and visible around the eyepiece's field of view. The cluster appeared very similar to the picture I took, shown herein.

Photo details: 60 minute exposure, 102 mm (4-inch) f/6.3 apochromatic refractor, SBIG ST-2000XCM CCD Camera -10°C, March 15, 2012, KEASA Observatory, Barking Sands, Kauai, Hawaii.

Jay And Liz Thompson: Observers from Nevada

We observed NGC-2362 on February 17th and 19th, 2012 through 10-inch and 14-inch telescopes from our backyard in Henderson, NV. This fine open cluster is centered about Tau Canis Majoris, which is a visual triple.

An image taken Feb 19, 2012 approximates our visual impressions.



We also viewed a bonus object, the Winter Albireo (H 3945), which lies a degree or so north of the cluster.

Buddy Barbee: Observer from North Carolina

This observation of NGC-2362, known as the Tau-CMa cluster and Caldwell 64, was made Friday, Feb 17, 2012 from the back yard of my home in Winston-Salem, NC. I was using a 5-inch Mak-Cass with a 24mm eyepiece for a magnification of 79X. It was a beautiful clear night with a mild temperature of about 44º F. The naked-eye limiting magnitude was only 4.3.

Using a 24mm eyepiece for a magnification of 79X and a true field-of-view of 52 arc minutes, finding NGC-2362 was very easy with the scopes GOTO. I did my alignment on Capella and Alphard, entered NGC-2362 into the controller, pressed enter and then GOTO and there it was, almost dead-center in the field-of-view. Normally, from a dark sky site, there's a faint gray haze behind the cluster, but looking at the cluster in town with all the light pollution, the sky was much too bright to see this haze. Upping the magnification to 146X with a 13mm eyepiece, I could count 17 stars around Tau-CMa in a circle having a diameter of 8 minutes. This cluster has a Trumpler Classification of I2r, which means that it is detached from the surrounding star field with a strong concentration toward the center, has a large range in brightness and is rich in stars (more than 100). I would say that is an excellent description of the cluster except for the number of stars visible in it. On the best of nights with my 10-inch Dob, I have never seen more than about forty stars in this cluster. Still, this cluster is often described as a jewel surrounded by diamond dust and that is how it appears even in town with fewer stars visible.

NGC-2362, the Tau Canis Major cluster, is sometimes called the Mexican Jumping Bean Cluster, due to an interesting effect that occurs when the telescope is tapped. The clusters fainter stars will appear to stop moving while the bright central star, Tau Cma, continues to move. This happens due to a phenomenon known as persistence of vision and is a very neat effect to watch. Give it a try and see what you think.

DEEP-SKY OBSERVATION SKETCH FORM

CONSTELLATION: Canis Major **OBJECT No.:** NGC 2362

Observer: BLB Location: Home

Day & Date: Sun., Feb. 26, 2012

Time (local): 8:50 PM EST

Telescope/Aperture: ETX 125 PE (5")

Eyepiece/Mag.: 24mm / 79x

Field-of-View: 00° 52'

Filter: None

Seeing (1-5): 4 Transparency (1-7): 5

NELM: 4.3 Temp.: 44°F

Wind: calm Humidity: 33%

OBJECT:

Type: Open Cluster

RA: 07 hr. 18.7 min.

Dec.: -24 d. 57 min.

Listed Size: 8' Mag.: 3.8 SB: —

NOTES: I count about 17 stars in a circle about 8 arc minutes in diameter.

Trumpler Classification = I3r

Jaakko Solaranta: Observer from Finland

NOTE: Jaakko observed it on four separate dates and provided three drawings to accompany his notes.

Instrument: Naked eye & 5X21mm finder

Date: Apr 18/19, 2004

Location: Base del Teide, Tenerife, Spain (7,480ft)

NE Lim. Mag.: 7.1

Weather: -0°C, very cold, but excellent.

Description: Easily visible with the naked eye as a fuzzy patch surrounding Eta CMa. No sign of resolution but a simple 5X21 finder revealed a strong glow surrounding the named star and few faint members from it.

Telescope: 80mm (3-inch) refractor

Date: Mar 13/14, 2012

Location: Koivukylä, Vantaa, Finland

NE Lim. Mag.: 4.8 (SQM-L: 18.31)

Weather: +0°C, humidity ~54%, 1017 hPa, sun -12° below the horizon.

Description: Fairly easily visible even at an altitude of 5° and such small aperture. The cluster does not rise higher than this from Southern Finland (60° 18' north 25° 03 east) so the object is nothing more than a shadow compared to its real appearance. The cluster is surrounding - but mostly south of - Tau Canis Majoris which displays only a few mag. 10 members and a faint background glow.

Telescope: 120mm (4.75-inch) refractor

Date: Nov 25/26, 2011

Location: Playa de Fañabé, Tenerife, Spain

NE Lim. Mag.: 5.2 (SQM-L: 18.80)

Weather: +16.8°C, 1016 hPa, clear, humidity 65%

Description: Gorgeous cluster dominated by the brilliant mag. 4 Tau Canis Majoris. In total 40* mag. 9-13 stars visible within a slightly E-W elongated area of 5' x 7'. Brighter stars are mostly packed south of Tau CMa. Symmetrical and several chains of stars especially in the N and S sides. Stars form a familiar shape of a ladybug hence the nickname "The Ladybug Cluster". Outside the field, to the east, a small river of stars flows north of mag. 6 star HD 57192. Large and sparse open cluster ASCC 37 is located 30' NW from Tau CMa and appears as a 10' x 7' grouping of mostly mag. 10 and 11 stars.

Telescope: 120mm (4.75-inch) refractor

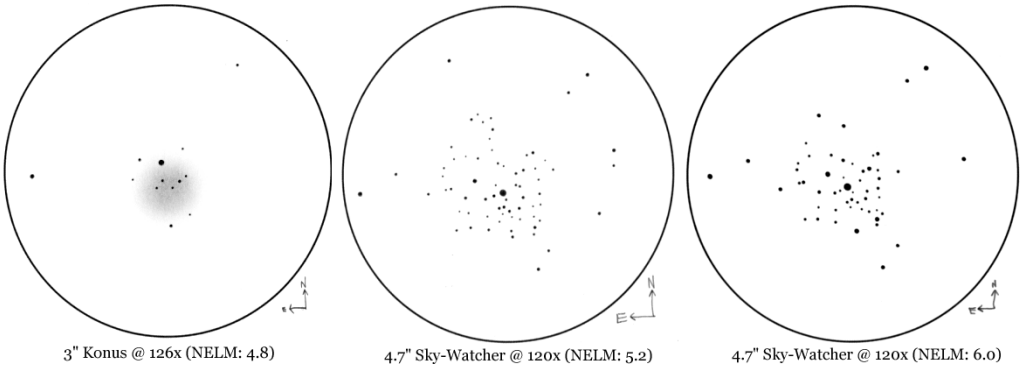
Date: Mar 31, Apr 1, 2008

Location: Los Cancajos, La Palma, Spain

NE Lim. Mag.: 6.0

Weather: +17°C, NE wind, clouds

Description: Dominated by the mag. 4 Tau CMa. Low power reveals an obvious glow surrounding the star in the center which is bright enough to interfere with night vision. Quite symmetrical. A lovely cluster.



3" Konus @ 126x (NELM: 4.8)
Koivukylä, Vantaa, Finland

4.7" Sky-Watcher @ 120x (NELM: 5.2)
Playa de Fañabé, Tenerife, Spain

4.7" Sky-Watcher @ 120x (NELM: 6.0)
Los Cancajos, La Palma, Spain

Fred Rayworth: Observer from Nevada

I first observed this highly unusual and distinct cluster on January 25, 1996 from my back yard in Tipton, Oklahoma. With a 16-inch home-made f/6.4 Dob at 70X, my notes say: "Wow! Very small open consisting of odd shape with about twenty stars grouped around a central bluish one."

My next observation was with the same scope, same magnification from Sunset Overview at Lake Meade, Nevada on January 23, 2004. I described it almost the same with "Wow! Bright star closely surrounded by about 20 even magnitude stars."

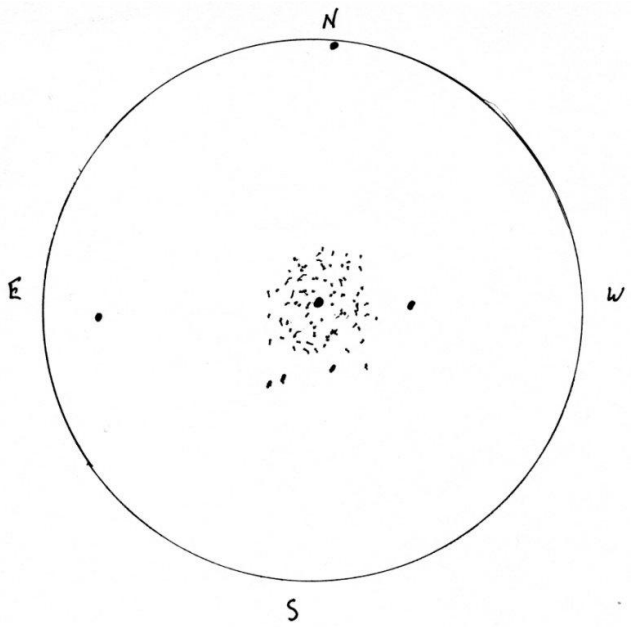
The next observation, this time with a 16-inch f/4.5 and a magnification of 87X, was done from a bike trail parking lot on Blue Diamond Road, Nevada, and an extremely lousy observing site. It was actually the highlight of the evening for such a light-polluted observing session. "Nice surprise. Quite beautiful small open cluster dominated by a bright central star."

By far, my most detailed observation, and the one I did purposefully for this challenge was a month early, on February 25, 2012 from Spring Mountain Ranch, Nevada, just in case March wouldn't pan out, which it didn't, as it turned out! Using the 16-inch f/4.5 with magnifications ranging from 40X to 102X to 131X, I logged the following notes: "Wow! (I say Wow! a lot) A gathering of maybe 30 medium-bright stars with a super bright one right in dead center. Has sort of a rust orange tint to it. Right behind it is a hint of haze suggesting more stars that aren't quite resolvable, but not sure if that's just the glow from that star or something more. There are quite a few stars visible and I can count about 20 outright."

Unfortunately, when I drew the picture, I forgot to add in the haze. Also, I probably threw in more than 20 dots (I didn't actually count), so my drawing is just a generalization of what I saw, not the actual image. I'm no artist and make no bones about it. Our other contributors are, so go to them if you want more accuracy. The drawing I made that night in my log book is no better!

NGC-2362

102X



Roger Ivester: Observer from North Carolina

Date: February 25, 2012

Location: Backyard in Boiling Springs, North Carolina

Conditions: Both seeing and transparency excellent

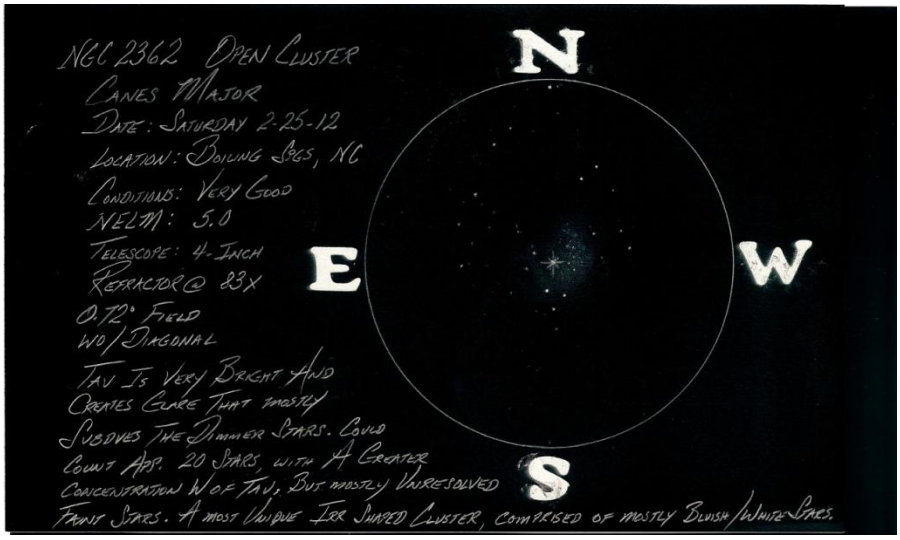
NELM: 5.0

Telescope: 102mm (4-inch) refractor without diagonal

Magnification: Sketch @ 82X

Pencil Sketch: 5 X 8 white notecard with colors being inverted using my scanner.

A beautiful and most interesting open cluster, however, many faint stars were subdued by the brighter star, mag. 4.4 Tau Canes Majoris. The greatest concentration of stars appeared to be on the western edge, but were very difficult, creating an unresolved haze, mostly in part due to the intense glare of Tau. There was very little resolution of the stars when using the 4-inch refractor at low magnification with only the brightest members visible. When increasing the magnification to 82X, approximately 20 stars could be counted. A much better resolution of the cluster would've been possible, if not for one annoying streetlight. The cluster had a very irregular appearance, with all of the stars appearing mostly bluish-white.


NGC 2362 Open Cluster
Canes Major
Date: Saturday 2-25-12
Location: Boiling Spgs, NC
Conditions: Very Good
NELM: 5.0
Telescope: 4-Inch
Refractor @ 23x
0.72° Field
W/O Diagonal
Tau Is Very Bright And
Creates Glare That Mostly
Subdues The Dimmer Stars. Could
Count Approx. 20 Stars, With A Greater
Concentration N of Tau, But Mostly Unresolved
Faint Stars. A Most Unique Irr Shaped Cluster, Comprised of Mostly Bluish/White Stars.
N
E
W
S

Gus Johnson: Observer from Maryland. **NOTE:** On April 19, 1979, Gus Johnson, visually discovered Supernova 1979C in spiral galaxy M-100. NASA announced on November 15, 2010, there was evidence of a black hole as a result of this supernova explosion.

Tau seems to be a cluster member. If so, it's about as bright as Rigel. There are two listed companions, mag. 10 at 8.2" and mag. 11 at 14.5. On March 5, 1991, I found both almost too easy with my 6-inch Newtonian at 98X. Being in a cluster makes their being optical companions.

As to the cluster in my 4 1/4-inch reflector at 28X, it isn't quite adequate. A formerly owned 5 1/4-inch at 39X gave a nice view. When using my 4 1/4-inch at 38X, I noticed a nearly equal pair a quarter of the way between UW and Tau. UW is almost as bright as Tau and is 1/2º to its' north.