

MONTHLY OBSERVER'S CHALLENGE

Las Vegas Astronomical Society

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&

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Porrima/Gamma (29) Virginis, Double Star In Virgo

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.

Porrima/Gamma (29) Virginis, Double Star In Virgo

Gamma Virginis, otherwise known as Porrima is a binary star system consisting of two stars of approximately the same magnitude. They're mags. 3.65 and 3.56 respectively. Because they're binary, they rotate around each other and their separation varies. It was the widest in 1836. The pair has an orbit of 168.93 years.

Until the beginning of the 1990's, it was an easy object for those with small telescopes, but it won't be again until 2020. It's still possible to separate them with high magnification, excellent seeing and moderate aperture.

Observations/Drawings/Photos

John Pierce: Observer from Nevada



I have been in this hobby since my childhood. Then I went for decades where I would only break out a telescope for special celestial events. After retiring and moving to Las Vegas, I have gotten back into astronomy with a little more enthusiasm. I still have the 50+ year old two and a half inch refractor I used from youth to a couple of years ago.

I found observing double star Porrima a good test of the optics of my 6-inch f/5 reflector. Using a 7.5mm eyepiece with a 2X-Balow (200X), I observed Porrima the 1st and 3rd of May, 2013. The first night, it was at its highest point in the sky. On the second, earlier in the evening, it was still in the glare of the city lights. To ensure that I was viewing Porrima in focus, I first focused on the planet Saturn and then turned the scope to Porrima. Viewing conditions were poor since I observed through the Las Vegas bright and hazy skies. Porrima appeared as an hourglass-shaped star. I couldn't see a clear separation of the two stars. Had I not known what I was viewing, I wouldn't have recognized it as a double star, but thought what I was seeing was a result of poor optics. However I have never seen two stars so close together and it will be interesting to watch for years to come as the gap between them increases.

Rob Lambert: Observer from Nevada



I was able to observe Porrima on May 18, 2013 from Spring Mountain Ranch State Park, just outside of Las Vegas, in the Red Rock Canyon National Conservation Area. Elevation was approximately 3,800 feet above sea level with the temperature in the mid 60s. Transparency was above average and seeing was about average.

My first attempt to split Porrima with my normal Maillincam setup (5-inch f/7.5 refractor) with Mallincam VSS+ and a 0.5 focal reducer) resulting in an effective magnification of 60X was obviously futile, but I had to try it. Even removing the focal reducer, achieving a magnification of 120X was not capable of achieving a split. Adding a 2X Barlow to achieve a magnification of 240X resulted in the image below.

If my orientation is correct, Porrima B should be northeast of Porrima A in the image. Although the A and B components of Porrima are listed as being almost equal in magnitude, to me, the A component appears to be brighter.

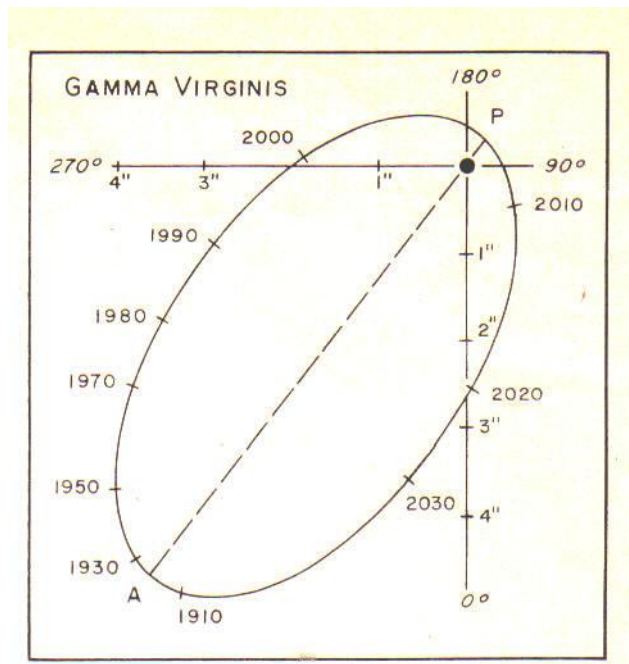
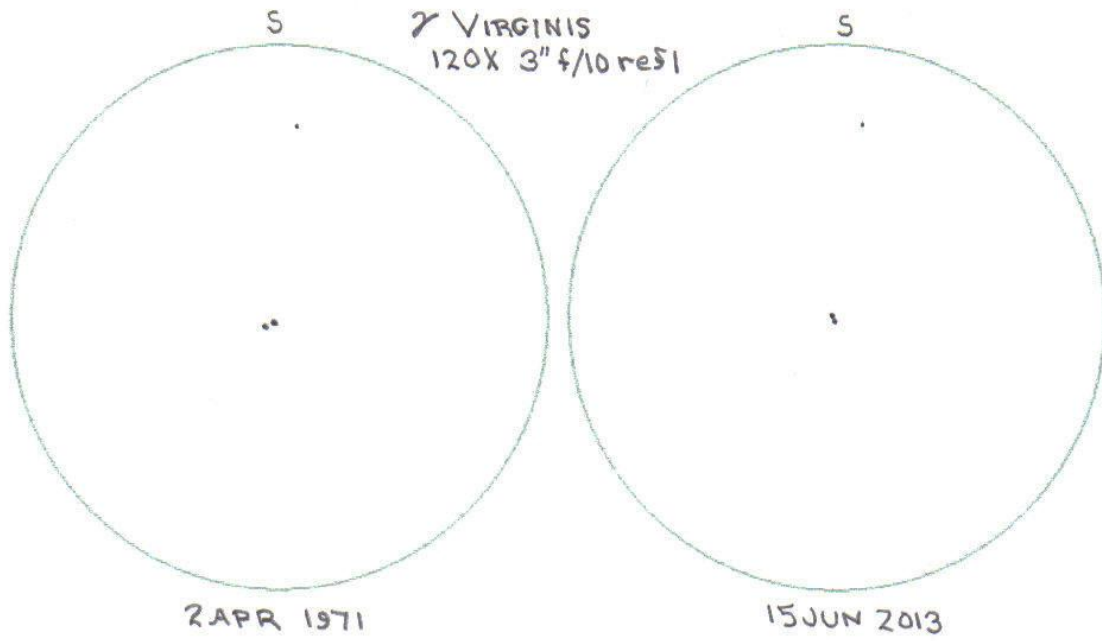
I was also able to split the pair visually with my 5-inch refractor using a 6.5mm eyepiece with a 2X Barlow in the optical path. This combination achieved a magnification of 292X. Although the split was achievable at this magnification, the Mallincam provided the more pleasing image. The seeing just didn't support the additional 52X of magnification very well.



Glenn Chapple: Observer from Massachusetts



Finally!!! I was able to make an updated observation of Porrima. I'm sending a "time lapse" of sorts - reproductions of sketches made in 1971 and again the other night. Both are based on observations made with my trusty old 3-inch f/10 reflector - still going strong after 4 decades. The 1971 sketch shows the secondary a bit over 4 arc-seconds NW of the primary. Since then, it's passed west and then south of the primary to its present location about 2 arc-seconds to the NE. Seeing conditions were above average when I made the recent observation. I couldn't get a clean split at 120X, but Porrima showed a definite elongation SW to NE orientation, confirmed when I viewed Porrima with a 4.5-inch f/8 reflector and 6mm modern eyepiece (quite an upgrade from the 6mm microscope eyepiece that came with the telescope!). With that setup, the 150X image was exquisite - both components sporting a pale yellow hue. For the purpose of comparison, I've also attached a diagram of Porrima's orbit, taken from a 1971 *Sky and Telescope* reprint.



Jay and Liz Thompson: Observers from Nevada



We observed Gamma Virginis from our back yard in Henderson, NV on April 1, 2013 with a 14-inch f/11 SCT. Using a 14mm eyepiece (279X), we easily resolved Gamma Virginis into two equally bright white stars. On April 17, 2013, we viewed it again from the same location using an 80mm f/11 achromatic refractor. We cleanly split Gamma Virginis at 230X using a 4mm eyepiece. The Airy discs were very close with a thin black line separating the stars.

Roger Ivester: Observer from North Carolina



On May 13, 2013, I used a 102mm (4-inch) refractor at 196X to observe Porrima. The sky conditions were fair.

Gamma Virgo has always been one of my favorite double stars, and is the first double to be included in the Observers Challenge. Gamma is a true binary with a 170-year period. Double star observing can be a lot of fun and very rewarding. However, fewer and fewer amateurs seem to be involved in this aspect of amateur astronomy. This is very unfortunate, as there is nothing more beautiful than a close pair of doubles with very contrasting colors. Double star observing has some advantages over galaxies, nebulae and star clusters, as many can be observed with a moon and in severe light pollution.

With seeing being only fair, I could see both stars being merged together or notched, however, during moments of steady viewing, I could see dark-sky between the two components. Both stars appeared white. The following sketch was made using a No. 2 pencil, and a blank 5 X 8 note card. The colors were inverted using a scanner.

GAMMA VIRGO - "PRIMA" DOUBLE STAR

RA 12^h 41.7 DEC. - 01.5

MAGNITUDES: 3.5 / 3.5 SEP. 2.0"

DATE: MAY 13th 2013

TELESCOPE: 4-INCH REFRACTOR

13MM + 2X BARLOW - 167X

SEEING: FAIR - ABOVE AVERAGE

COLORS: BOTH APPEAR WHITE

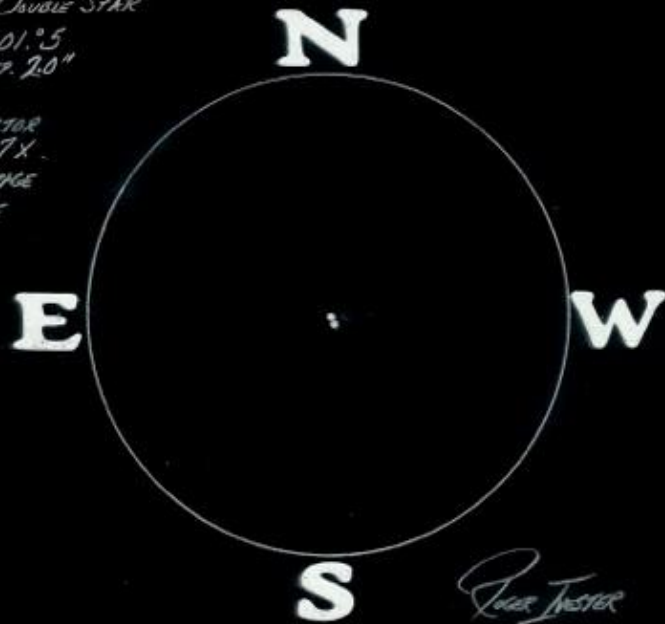
NOTICED, HOWEVER DURING

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DARKNESS BETWEEN

COMPONENTS.



Debbie Ivester: Observer from North Carolina



This was my first double star. I was using a 102 mm (4-inch) refractor at a magnification of 196X. At this magnification, Gamma Virgo appeared as an elongated star. With careful and patient observing, I could make out two individual stars of the same magnitude on an intermittent basis. Both stars appear white in color. When observing double stars, it's very important to keep your eye open and look carefully into the center of the eyepiece.

Fred Rayworth: Observer from Nevada



I've never been a big fan of double stars. It's just not my thing. Back in the day, when I built my 8-inch f/9.44 reflector, I had a fascination with the Double Double, Epsilon Lyrae. With that scope, I could easily split both pairs. However, when I built my 16-inch twenty years later, I couldn't split either one to save my life with full aperture. I finally did by using an aperture mask. The full aperture just cut too much atmosphere. I've heard super-duper mirrors of that aperture can split the double double routinely but when these braggarts were supposed to put up or shut up, they couldn't do it on every occasion they were supposed to prove it to me. Thus, "cheating" the system with an aperture mask did the trick, but even then, only on the best nights. Questar was right about smaller aperture and the atmosphere. Yet, I've seen many a refractor that can easily split the double double and smaller reflectors of decent quality and on decent nights. To make a long story short, that is my history with double stars. That single object. I've tried with my 16-inch f/4.5 on the double-double but each time, I don't think those with refractors could have split them because the sky was swimming. I picked bad nights.

When this challenge came up, I knew I was in for a tough one once I figured out what we were really supposed to be looking at. At first, I thought it was an easy pair, binocular territory. Oh boy, was I wrong! When I focused on Porrima and noticed none of the nearby stars looked like what I'd call much of a double, I did a close look at 102X. Uh oh. The single star didn't look quite round. Knowing my scope was actually aligned quite well at that latitude, and since the other nearby stars were round (though "swimming" pinpoints), it dawned on me that maybe this wasn't such an easy object! At 102X, there was no way I was going to separate this oval blob into two stars, especially the way it was dancing around.

We'd set up at Spring Mountain Ranch on the west side of the Las Vegas Valley near Red Rocks. The night was calm but the sky conditions, seeing and transparency were

horrendous early that evening. The winds were relatively calm but we'd been looking at Saturn and I couldn't keep it focused for more than a split second. I saw five moons between blurs, but couldn't see much detail on the surface of the planet or any detail in the rings. Planetary details are how I determine sky conditions. They were going to be bad.

The oval blurred in and out of focus, but it was easy to see it wasn't a single star. I cranked the magnification up to 229X. The oval blob became larger and more ragged. It swelled and shrank, changed colors, as stars do, and somewhere amongst all that light noise, I glimpsed to distinct cores. They flickered in and out of view, but they were definitely there. One seemed just a tad brighter or larger than the other one but that was only an impression. I had several people around me and gave them a look, and everyone saw the two stars within the oval blob.

I tried 390X but that only dimmed it to the point that the two star cores became lost in the blob. I did at one point see the two cores, for just a second. It was such a strain to try and focus on the blob that it started to give me a headache. I backed off again to 229X.

I tried again at the Lee Canyon Ski Resort near Mt Charleston at 8,665 feet and obtained the same results on two different nights. One day, I'll have to cut an aperture mask to fit my new scope and give that a try. I want to use it on Uranus and also see if I can make out the disks of Jupiter's moons.

Pollina
GAMMA Virginis
229X

