

Reflector

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The Changing Face of the Sun
2014 Horkheimer Youth Service and Journalism Awards
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Star Sisters—Observing Twins

Cepheus is an ancient constellation representing the mythological King Cepheus of Aethiopia, husband of Queen Cassiopeia and father of Andromeda. The constellation lies between Cassiopeia and Draco and spans declinations from 55 to 88 degrees north, making it circumpolar for most Northern Hemisphere observers. The constellation is best viewed from August to December when it is high above the horizon at the end of astronomical twilight.

Cepheus is situated on the edge of the Milky Way. However, unlike many Milky Way constellations, Cepheus does not contain a plethora of star clusters or nebulae. The constellation has no Messier objects and contains only 36 of the 7840 NGC objects (the average is 89 per constellation).

That being said, Cepheus does contain an excellent and fascinating object known as the Iris Nebula. The Iris Nebula is an example of a reflection nebula associated with an open star cluster. The star cluster is known as NGC 7023, although often that designation is applied to the nebula, too. Like its host constellation, NGC 7023 is circumpolar for most of the Northern Hemisphere and best viewed in the autumn months when it is highest above the horizon.

The Iris Nebula is found six degrees north and slightly west of the bright star Alderamin (Alpha Cephei). Perhaps the best way to star hop to NGC 7023 is to follow a line from the

DEEP-SKY OBJECTS

THE IRIS NEBULA

By Dr. James R. Dire, Kauai Educational Association for Science & Astronomy



star Errai (Gamma Cephei) through the star Alphirk (Beta Cephei) another three and a quarter degrees southwest. For reference, Errai and Alphirk are eleven degrees apart.

NGC 7023 is a fairly bright nebula surrounding a 7th-magnitude star known as V380 Cephei. The Iris Nebula is essentially the dusty molecular cloud out of which V380 and other stars formed. This massive, hot, spectral-class-B star's radiant output provides the illumination making the nebula visible. V380 varies slightly in brightness from magnitude 7.10 to 7.36. The star and nebula are roughly

1300 light years away and the bright reflection nebula spans six light years. The Iris Nebula is just a small region of a much larger complex visible with long exposure astrophotography.

The Iris Nebula is very irregularly shaped. Its brighter regions are easily seen using medium sized amateur telescopes. Careful observations, especially with larger light buckets, reveal very dark lanes within the nebular glow. Although the eyes only capture shades of gray at the eyepiece, pictures of the Iris Nebula display blue hues, indicative of starlight reflecting off of dust grains. The nebula's bright

filaments trace the shape of flower petals. The petals along with the blue color resemble the iris flower, the nebula's namesake.

The accompanying image of NGC 7023 was taken with a 102 mm f/6.3 apochromatic refractor with an SBIG ST-2000XCM CCD camera. The exposure was three hours. The image is 60 x 40 arcminutes. In the image, the brightest region of the nebula has drowned out V380 Cephei, but the star can easily be seen when viewing through a telescope. Other fainter stars in the NGC 7023 star cluster are visible in the image and in a telescope.

Just west (right in the image) of the westernmost blue "petal" lies a dark keyhole-shaped region surrounding a very faint star cluster. Known as Collinder 427, this star cluster is very faint (magnitude 13.8) and will challenge a 14-inch telescope except under the most pristine sky conditions. The cluster contains a dozen 14th- and 15th-magnitude stars.

Dark obscuring clouds of molecular gas and dust abound beyond the bright regions of the Iris. The clouds trick the eye into seeing a multitude of various shapes. The lack of background stars compared to other regions around NGC 7023 may be the only clue to the presence of these dark nebulae. Infrared observations of NGC 7203's molecular clouds indicate that the nebula may contain polycyclic aromatic hydrocarbons. ☼

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intent of these clubs is to foster renewed interest in our hobby, or different facets of it that had not been explored before by the observer. It was my understanding that unless the specific requirements of the club, as defined on the website, were not met, the observer should be awarded the certificate. The Astronomical League, its coordinators, and officers need to remember that they are in the service of the amateur astronomers that pay dues and support the League. When people have invested a significant portion of their lives (and/or money) in completing one of these programs, I believe they should be given the benefit of the doubt, or at the very least that the rules should be applied equally and to the letter.

Brad Young, P.E.

International Dark-Sky Association/*from page 7*

The goal of IDA and professional lighting engineers attuned to protecting dark skies is for the LED revolution to have improved outdoor nighttime lighting with less light being produced but more effectively used on the ground where it is needed for public security and safety. The goal is for the color rendition to be around 3000 Kelvin and not to exceed 3500 Kelvin so that the light is pleasing and less likely to produce excessive glare or the harmful effects of a more blue emission.

Tim Hunter

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