

# Reflector

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Located near its apex above the southern horizon as evening twilight fades this month is an interesting galactic neighbor known as Barnard's Galaxy. Cataloged as NGC 6822, Barnard's Galaxy is a dwarf irregular galaxy located in the northeastern corner of the constellation Sagittarius. It is located halfway between Rho Sagittarii and Alpha Capricorni. The galaxy is 16 by 12 arcminutes in size and has an integrated magnitude of 9.4. In a telescope–eyepiece combination with a one-degree real field of view, planetary nebula NGC 6818, the Little Gem Nebula, can be seen at the same time as Barnard's Galaxy.

Barnard's Galaxy is a member of the Local Group. It is 1.6 million light-years away. The galaxy is classified as an irregular galaxy, similar to the much closer Small Magellanic Cloud. Edward Emerson Barnard discovered the galaxy on August 17, 1884, using a 5-inch refractor. Edwin Hubble discovered 15 variable stars in Barnard's Galaxy, eleven of which were Cepheid variables. Using the newly discovered Cepheid period–luminosity relationship, Hubble calculated the distance to Barnard's Galaxy, the first galaxy beyond the Magellanic Clouds to have its distance determined. Hubble's 1925 paper, "N.G.C. 6822, A Remote Stellar System,"

# DEEP-SKY OBJECTS

## BARNARD'S GALAXY

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

was one of the greatest classical studies of the 20th century. He solved the great debate over whether galaxies (then called

Like the Magellanic Clouds, NGC 6822 has myriad active star forming regions. These H II regions appear very colorful in



long-exposure CCD images. Due to its close proximity to the Milky Way, Barnard's Galaxy's H II regions and OB associations have been extensively studied. It is one of the few galaxies in which individual stars can be resolved by relatively small ground-based research telescopes.

Irregular galaxies are typically small galaxies (most are dwarf

nebulae) were part of the Milky Way Galaxy or were unique galaxies of their own, far beyond the edges of the Milky Way.

Hubble also discovered three star clusters in NGC 6822, which he assumed were ancient star clusters like the hundred or so globular clusters in the Milky Way. Follow-up studies showed one of the three to contain very old stars, one intermediate-aged stars, and one very young stars. Perhaps globular star clusters are still being born.

galaxies) that have no distinct spiral or elliptical shape. Many of them get their irregular shape from gravitational interactions with a nearby massive galaxy. Others rotate too slowly to flatten out into disks, as spiral galaxies do. Barnard's Galaxy, like the Magellanic Clouds, has probably been distorted by the massive gravitational force of our Milky Way Galaxy.

Because of its low surface brightness and lack of a bright central core, Barnard's Galaxy

can be very challenging to find without a go-to telescope. The best way to star hop is to find the Little Gem Nebula and pan 40 arcminutes south and 10 arcminutes east. Low magnification can place both in the same field of view and the increased dark area around the galaxy will make it stand out more. I have viewed it in telescopes of various sizes, but all views were unimpressive except from my 14-inch f/6 Dobsonian reflector at 82x, where I could collect enough light to see some shape to the galaxy. Although many people report the galaxy to appear rectangular, it looks more elliptical to me. This is due to a bar-like feature in the galaxy, running north–south.

My image of NGC 6822 was taken with a 190 mm (7.5-inch) f/5.3 Maksutov–Newtonian with a SBIG ST-2000XCM CCD camera. The exposure was 170 minutes, barely enough time to capture faint detail, yet more detail than can be seen at the eyepiece. Several H II regions are visible in the image as the pink nebulosity. Most of the resolved stars are actually foreground stars in the Milky Way. However, some may be very bright massive stars, or associations of stars not quite resolved, located in Barnard's Galaxy.

The next time you point a telescope towards Sagittarius, take a break from all the splendid star clusters and nebulae and grab a look at one of our closest galactic neighbors. ☼

The Shreveport Regional Arts Council hosted an exhibit called "Astrophotography: an astronomical photographic view of the night sky," a collection of astronomical photographs created at the Worley Observatory by the members of the Shreveport–Bossier Astronomy Society (SBAS). Artspace in Shreveport, Louisiana, hosted this exhibit from June 6 through July 6, 2013, and it was sponsored by Classic Reprographics Inc.

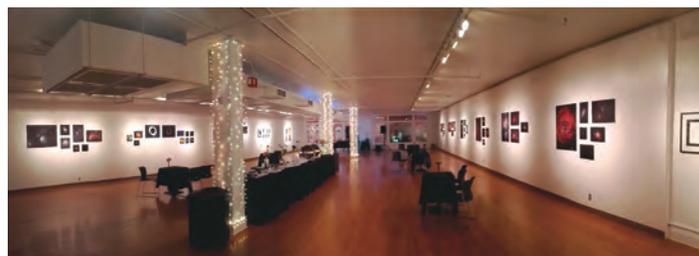
The astrophotography exhibit was the idea of Shreveport artist Jody Raney. He is a portrait artist and Mardi Gras float designer and was 2013 SBAS president. SBAS members were producing an abundance of astrophotographs but had nowhere to show them. Raney thought this would be an excellent opportunity for outreach to local schools and the community. He contacted the Shreveport Regional Arts Council and they jumped at

## An Astrophotography Exhibit

the opportunity to exhibit the club's art.

Don Razinsky, reprographer at Classic Reprographics Inc., printed and mounted all of the photography. Most pieces were 30x42, 24x36, or 11x17 inches in size, and all were full color. We had a section for old film photos as well. The photos were arranged on the walls in themed groups, but were also arranged for visual color and contrast.

Opening night at Artspace was outstanding! Walking up the stairs and stepping into the gallery, one could see that the exhibit was going to be "of astronomical proportions." Star lights sparkled on the columns, and star- and planet-shaped cheese and crackers were served with wine. The old wood floors, white walls, and contrasting draped black tablecloths made the gallery look special



with an astronomy theme. Despite some rain, we hosted around 200 to 250 people that night. The artists were excited about displaying their work. The guests enjoyed the show and several photos were sold.

Photographs in the exhibit were by Terry Atwood, Ron Dilulio, Trent Dupuy, Paul Goodwin, Austin Grant, Sidney Grimes, Nick Hobbs, Cran Lucas, Pat Madden, Joey Matheson, Jody Raney, Coy Wagoner, Don Walters, Stan Westmoreland, and Reid Williams.

The show continued until July 6, and was held over an additional week due to its popularity. This was an excellent, and slightly unusual, outreach program. We thank our sponsor, the members of the SBAS, and the Shreveport Regional Arts Council for an excellent show.

**Jody Raney, Astronomical League Outreach Award recipient, Shreveport–Bossier Astronomical Society**