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# Reflector



ALCON 2020 HAS BEEN  
REGRETFULLY CANCELLED DUE TO  
THE COVID-19 PANDEMIC.

**ASTRONOMICAL LEMONADE**  
**DOUBLE STAR OBSERVING**  
**GRAVITY WAVES & ELEMENTS 4 1-92**  
**STELLAFANE'S HALE SPECTROHELIOSCOPE**



The Indian Space Research Organization's Mars Orbiter Mission entered Martian orbit on September 24, 2014. After checkout, its Mars Color Camera began imaging the planet. One image taken toward the limb of the planet captured the larger moon Phobos silhouetted against the Martian surface. The thin atmosphere of Mars is the semitransparent layer just above the Martian limb. Image credit: Indian Space Research Organization  
[www.isro.gov.in/pslv-c25-mars-orbiter-mission/pictures-mars-colour-camera-mcc-onboard-india%E2%80%99s-mars-orbiter](http://www.isro.gov.in/pslv-c25-mars-orbiter-mission/pictures-mars-colour-camera-mcc-onboard-india%E2%80%99s-mars-orbiter)

(JAXA) has received approval to launch the Mars Moons Exploration (MMX) probe to visit Phobos, analyze the surface, and take samples of the moon to be returned to Earth. The launch is scheduled for 2024, with an arrival at Mars the next year. If everything goes as planned, we will have samples of Phobos to analyze in 2029.

—Berton Stevens

## Deep-Sky Objects

### NGC 6603

By the end of astronomical twilight during summer months, the constellation Sagittarius is rising above the southern horizon as viewed in the contiguous 48 states. Sagittarius hosts the center of the Milky Way Galaxy, so the constellation is exceedingly rife with galactic and globular star clusters, bright and dark nebulae, and uncountable colorful stars. From cities and bright suburbs, all that might be recognizable in the constellation are the eight stars that make up the famous Teapot asterism. But from dark regions without light pollution, the bright swath of the Milky Way, with the dark dust lane that parts the plane of the galaxy in two, blazes across the Archer and practically drowns out the Teapot.

The famous French astronomer Charles Messier discovered myriad nebulae and star clusters in

Sagittarius, which he published in his famous catalog. As a comet hunter, Messier cataloged these objects so he wouldn't confuse them with comets that he might find. He ultimately discovered 13 comets.

On the night of June 20–21, 1764, Messier came across two star clusters in Sagittarius at declination  $-19^\circ$ . He ultimately catalogued these objects as M23 and M25. In sweeping back and forth between these clusters, Messier observed a large region of nebulosity halfway between them. Although not a galaxy, nebula, or star cluster, Messier entered this patch of the Milky Way into his catalog as his 24th entry. He wrote this about his discovery of M24:

*In the same night, June 20 to 21, 1764, I have discovered on the same parallel as the star clusters I have just been talking about and near the extremity of the bow of Sagittarius, in the Milky Way, a considerable nebulosity, of about one degree and a half extension: in that nebulosity there are several stars of different magnitudes; the light which is between these stars is divided in several parts.*

Today we know M24 as the Small Sagittarius Star Cloud. This cloud lies above the Teapot on the northern boundary of the constellation and should not be confused with the larger and brighter Large Sagittarius Star Cloud centered above the Teapot's spout.

Nestled within the Small Sagittarius Star Cloud is a small cluster of stars six arcminutes in diameter known as NGC 6603. This cluster contains the highest concentration of stars in M24. The clus-

ter's magnitude is 11.1, fainter than any object in Messier's catalog. This might be why Messier did not find NGC 6603.

NGC 6603 is located three degrees west and 40 arcminutes north of M25. If M24 is divided into two lobes, with the north lobe the brighter, NGC 6603 lies on the southwest edge of the brighter lobe. NGC 6603 can be seen in a 4-inch telescope, but an 8-inch or larger telescope is required to resolve it into scores of stars and see the hues of red, yellow, and blue.

NGC 6603 has multiple linear and arcing chains of 11th and 12th magnitude stars. Just north of the cluster is a beautiful chain of four alternating red and blue stars between magnitude 10 and 11 with brighter colorful stars scattered throughout that region.

The accompanying image of NGC 6603 was taken with a 10-inch f/6.9 Newtonian with a SBIG ST-2000XCM CCD camera. The exposure was 30 minutes. In the image north is up and east to the left. The bright red star on the south side of the cluster is cataloged as SAO 161294 and is magnitude 7.4. The bright yellow star on the lower left of the image is magnitude 7.7 whereas the brightest blue star near the top of the image, one-third of the way from left to right, shines at magnitude 9. The faintest stars in the image are dimmer than magnitude 18.

NGC 6603 was discovered by John Herschel on July 15, 1830. The cluster is estimated to be from 10,000 to 12,000 light-years away. The cluster is often mistaken for M24, but Messier made it clear in his notes that M24 was the larger star cloud. →



NGC 6603 and M24 are part of the Norma Arm of the Milky Way, an interior spiral arm to the Sagittarius-Carina Arm lying 5000 to 7000 light-years away. The dark nebulae around M24 are located in the Sagittarius-Carina Arm, which also contains the Lagoon, Trifid, and Omega Nebulae.

During warm, clear, late summer nights when panning the Milky Way for those myriad Messier objects, take some time in M24 to spy the superb star cluster NGC 6603.

—Dr. James R. Dire  
Kauai Educational Association  
for Science and Astronomy

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Articles may be submitted as Microsoft Word or just about any kind of text document attached to an email, or even as the body text of an email. Send them to editor Kris Larsen at [larsen@ccsu.edu](mailto:larsen@ccsu.edu). Kris and assistant editor Kevin Jones read all submissions and may provide editorial help. Of course your submission must be relevant and scientifically accurate, and we will reject items that are not. Short items of interest may be published as letters to the editor. If your submission includes photos, it is best to compress article and photo(s) in a .zip archive for emailing. If the total size of the package exceeds 10 MB it's advisable to break it up into multiple emails. See deadlines on Page 4.

Photos should be at least 300 pixels per inch of width in print.

← 725 PIXELS →

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