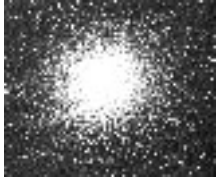


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Messier 13

Observations and Descriptions

Discovered by Edmond Halley in 1714.

Messier: [M13](#).

June 1, 1764. 13. 16h 33m 15s (248d 18' 48") +36d 54' 44"

A nebula without a star, discovered in the belt of Hercules; it is round & brilliant, the center is more brilliant than the edges, one perceives it with a telescope of one foot [FL]; it is near two stars, both of 8th magnitude, the one above and the other below it: the nebula's position was determined by comparison with Epsilon Herculis. M. Messier has reported it on the chart of comet of 1779, which was included in the volume of the Academy of that year. Seen by Halley in 1714. Seen again Jan. 5 and 30, 1781. It is reported in the English *Celestial Atlas* (diam. 6')

[*Mem. Acad.* for 1771, p. 441 (first Messier catalog)]

In the night of June 1 to 2, 1764, I have discovered a nebula in the girdle of Hercules, of which I am sure it doesn't contain any star; having examined it with a Newtonian telescope of four feet and a half [FL], which magnified 60 times, it is round, beautiful & brilliant, the center brighter than the borders: One perceives it with an ordinary [non-achromatic] refractor of one foot [FL], it may have a diameter of three minutes of arc: It is accompanied by two stars, the one and the other of the ninth magnitude, situated, the one above and the other below the nebula, & little distant. I have determined its position at its passage of the Meridian, and compared with the star Epsilon Herculis; its right ascension has been concluded to be 248d 18' 48", & its declination 36d 54' 44" north.

It is reported in the Philosophical Transactions, *no. 347*,
page 390,

that Mr. Halley discovered by hasard that nebula in 1714: it is, he says, almost on a straight line with Zeta & Eta according to Bayer, a bit closer to the star Zeta than to Eta, & when comparing its situation between the stars, its place is rather close to Scorpius 26d 1/2 with 57 degrees Northern [ecliptical] latitude, it is nothing but a small patch; but one sees it well without a telescope when the weather

is fine, & if there is no light of the moon.

[p. 455] 1764.Jun. 1. RA: 248.18.48, Dec: 36.54.44.B, Diam: 0. 3. Nebula without stars, in the girdle of Hercules, at 2 degrees below the star Eta of that constellation.

Halley: [No. 6, Nebula in Hercules](#)

The Sixth and last was accidentally hit upon by M. *Edm.*

Halley in the Constellation of *Hercules*, in the Year 1714. It is nearly in a Right Line with Zeta and Eta of Bayer, somewhat nearer to Zeta than to Eta: and by comparing its Situation among the Stars, its Place is sufficiently near in [Scorpio] 26 deg 1/2 with 57 deg 00. North. Lat. This is but a little Patch, but it shews it self to the naked Eye, when the Sky is serene and the Moon absent.

De Chéseaux: **De Ch. No. 21.**

I haven't yet found that in Hercules, which was discovered by M. Halley. I strongly wish that the astronomers at Paris would like to indicate me its place.

Bode: [Bode 30.](#)

A rather vivid nebula.

On September 9 [1774], with the 7-foot telescope, I found a very distinguishable nebulous star in Hercules between Eta and Zeta, which shows up as a rather vivid and round nebulous patch, which has a bright nucleus in its center. Actually, it is situated between two small stars, and is separated from the Northern one by 17.25' and from the Southern one by 16.75', as the third figure shows. From the star Zeta, I find with the heliometer a separation of 4deg 59', from Eta 2deg 29', from Pi 6 deg 43', and from d 4deg 57'. It was only partially known to me at that time that *Halley* has observed a nebulous star in Hercules, and later I read in the Philosophical Transactions of the year 1716 that he had observed it in the year 1714 between Eta and Zeta at about 236 deg [ecliptical longitude] and 57 deg northern [ecliptical] latitude; therefore, it has to be assumed that this must be the same one. Meanwhile *Halley* writes that the nebula is a bit closer to the star Zeta than to Eta. As I now find that it is situated [much] closer to the star Eta than to Zeta, I don't know another reason responsible for this remarkable difference than a typing error at *Halley*, or his inaccurate estimate of the position given by longitude and latitude.

Koehler: [Koehler No. 18](#)

[Nebula] *In Hercules*

Caroline Herschel

October 29, 1782. Observed M13 and [M37](#).

William Herschel

[First observed M13 on August 22, 1779]

[PT 1814, p. 275-276, reprinted in Scientific Papers, Vol. 2, p. 535]

May 16, 1787. 20 feet telescope. "The 13th of the *Connoiss.* [M 13 = NGC 6205] is a most beautiful cluster of stars. It is exceedingly compressed in the middle and very rich. The most compressed part of it is round and is about 2 or 2 1/2' in diameter, the scattered stars which belong to it extend to 8 or 9' in diameter, but are irregular." (*)

(*) The 20 feet telescope, on account of the moderate weight of the mirror and the proportionally long wooden tube, has the great advantage that with proper precaution it may be used at any temperature. Sometimes, however, a sudden change from cold to heat towards the morning has put a stop to the observations of the night. The mirror will also preserve an excellent polish for several years; and having a second one ready to supply the place of that which is in use the instrument may always be ready for observation.

[PT 1818, p. 439, reprinted in Scientific Papers, Vol. 2, p. 597]

*The 13th of the
Connoissance.*

[M 13 = NGC 6205]

"1799, 1805. It is plainly to be seen to the eye."

"1799, 7 feet finder. Very visible."

"1783. 7 feet telescope. With 227 plainly resolved into stars."

"1799, 10 feet telescope. With an aperture of 4 inches the stars cannot be distinguished; with 9 inches, very beautiful."

"1787, 1799, 20 feet telescope. The stars belonging to the cluster extend to 8 or 9 minutes in diameter; the most compressed part about 2 or 2 1/2; the latter is round, the former irregular."

"1805, large 10 feet telescope. A brilliant cluster all resolved into stars. The space penetrating power of this Newtonian reflector is $\sqrt{41 \cdot (240^2 - 39^2)} / 2 = 75.82$ "
By the observation of the 7 feet telescope, the profundity of this cluster is nearly of the 243d order.

John Herschel (1833): h 1968.

h 1968 = M13.

Sweep 71 (April 24, 1827)

RA 16h 35m 35.1s, NPD 53d 12' 57" (1830.0) [Right Ascension and North Polar Distance]

Very rich cluster; irreg figure; vL; vgmbM; stars 10...15 m, of which there must be thousands; does not come up to a nucleus; has hairy-looking curvilinear branches. (See fig. 86.)

Very rich cluster; irregular figure; very large; very gradually much brighter toward the

middle; stars from 10th to 15th magnitude, of which there must be thousands; does not come up to a nucleus; has hairy-looking curvilinear branches. (See fig. 86.)

Sweep 28 (May 9, 1826)

RA 16h 35m 36.2s, NPD 53d 12' 39" (1830.0)

Irreg R with scattered stars in streaky masses and lines. Excessively condensed, to a perfect blaze. *s 11...20m; 7' or 8' diameter. Most magnificent object. The state of compression indicates a globular form not much denser at the centre.

Irregularly round with scattered stars in streaky masses and lines. Excessively condensed, to a perfect blaze. Stars from 11th to 20th magnitude; 7' or 8' diameter. Most magnificent object. The state of compression indicates a globular form not much denser at the centre.

Sweep 72 (April 27, 1827)

RA 16h 35m 39.7s, NPD 53d 12' 45" (1830.0)

A very fine and striking object, but nothing to add to the description of Sw 71.

Smyth: DLXXXV [585]. M13.

DLXXXV. 13 M. Herculi.

AR 16h 35m 58s, Dec N 36d 45'.8

Mean Epoch of Observation: 1836.62 [Aug 1836]

[with a drawing]

A large cluster, or rather ball of stars, on the left buttock of Hercules, between Zeta and Eta; the place of which is differentiated from Eta Herculis, from which it lies south, a little westly, and 3deg 1/2 distant. This superb object blazes up in the centre, and has numerous outliers around its attenuated disc. It was accidentally hit upon by [Halley](#), who says, "This is but a little patch, but it shows itself to the naked eye, when the sky is serene, and the moon absent." The same paper, in describing this as the sixth and last of the nebulae known in 1716, wisely admits, "there are undoubtedly more of these which have not yet come to our knowledge:" ere half a century passed, Messier contributed his 80 or 90 in the Catalogue of 103; and before the close of that century WH [William Herschel] alone had added to the above 6, no fewer than 2500; and his son, in re-examining these, added 520 more! In my own refractor its appearance was something like the annexed diagram; but I agree with Dr. Nichol, that no *plate* can give a fitting representation of this magnificent cluster. It is indeed truly glorious, and enlarges on the eye by studying gazing. "Perhaps," adds the Doctor, "no one ever saw it for the first time through a telescope, without uttering a shout of wonder."

This brilliant cluster was discovered by Halley in 1714; and fifty years afterwards it was examined by M. Messier, with his 4-foot Newtonian, under a power of 60, and described as round, beautiful, and brilliant; but, "ferret" as he was in these matters, he adds, "Je me suis assuré qu'elle ne contient aucune étoile." This is rather startling, since the slightest optical aid enables the eye to resolve it into an extensive and magnificent

mass of stars, with the most compressed part densely compacted and wedged together under unknown laws of aggregation. In 1787, [Sir William Herschel](#) pronounced it "a most beautiful cluster of stars, exceedingly compressed in the middle, and very rich." It has been recently viewed in the Earl of Rosse's new and powerful telescope, when the components were more distinctly separated, and brighter, than had been anticipated; and there were singular fringed appendages to the globular figure, branching out into the surrounding space, so as to form distinct marks among the general outliers.

John Herschel, General Catalogue: GC 4230.

GC 4230 = h 1968 = M13, Halley.

RA 16h 36m 41.2s, NPD 53d 16' 19.4" (1860.0) [Right Ascension and North Polar Distance]

!!; Glob. Cl.; eB; vRi; vgeCM; st 11...20. 14 observations by W. & J. Herschel.

Very remarkable; globular cluster; extremely bright; very rich; very gradually extremely compressed toward the middle; stars from 11th to 20th magnitude.

Remark: Figures in P.T. 33 [JH 1833], plate viii, fig. 86; P.T. 61 [Lord Rosse 1861], plate xxviii, fig. 33.

Huggins

[Further Observations on the Spectra of some Nebulae, with a Mode of determining the Brightness of these Bodies. *Phil. Trans.*

Roy. Soc., Vol. 156 (1866), p. 381-397; here p. 389]

[No. [GC] 4230. 1968 h. 13M. R.A. 16h 36m 41s.2. N.P.D. 53d 16' 19".4. Cluster; extremely bright.]

Spectrum of the central blaze continuous. Spectrum ends abruptly in the orange. The light of the brighter part is not uniform; probably it is crossed either by bright lines or by lines of absorption.

Dreyer (1877)

Vol. VIII of the Annals of the Observatory of Harvard College, which was received at Birr Castle in the summer 1877, contains lithographs from drawings by Mr. Touvelot of the following Nebulae: GC 116 [M 31] (Pl. 33), 1179 [M 42] (Pl. 24, Woodbury type), 4230 [M 13] and 4294 [M92] (Pl. 25), 4355 [M20] (Pl. 32), 4447 [M57] (Pl. 34), 4532 [M27] (Pl. 35).

Dreyer: NGC 6205.

NGC 6205 = GC 4230 = h 1968; Halley 1714, M 13.

RA 16h 36m 40s, NPD 53d 16.3' (1860.0) [Right Ascension and North Polar Distance]

!! Glob. Cl., eB, vRi, vgeCM, st 11...; = M13

Very remarkable globular cluster, extremely bright, very rich, very gradually extremely compressed toward the middle, stars of 11th magnitude and fainter.

Remark: Figures in P.T. 33 [JH 1833], plate XVI, fig. 86; P.T. 61 [Lord Rosse 1861],

plate XXVIII, fig. 33; H.C. [Winlock and Trouvelot, *Annals of Harvard College Observatory*, vol. viii], plate 25.

Curtis

[Descriptions of 762 Nebulae and Clusters photographed with the Crossley Reflector. Publ. Lick Obs., No. 13, Part I, p. 9-42]

NGC 6205, RA=16:38.1, Dec=+36:39. [Publ. Lick Obs.] Vol. VIII, Plate 53. M. 13, the Great Cluster in *Hercules*. . 10 s.n.

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Last Modification: February 20, 2005