# What we today know about Churyumov-Gerasimenko

Today we not know a lot about the comet by the nickname “Chury”, but relatively new information has been gathered in recent years, especially since the comet was chosen to be the new target for the Rosetta mission. At the end of that mission, this will be prove to be one of the celestial bodies we know the most about, however, that knowledge will only be revealed in about a decade or so.

67P/Churyumov-Gerasimenko was discovered in 1969, when several astronomers from Kiev visited the Alma-Ata Astrophysical Institute to conduct a survey of comets. On 20 September, Klim Churyumov was examining photographs of comet 32P/Comas Solá taken by Svetlana Gerasimenko when he found a comet-like object near the edge of the plate.

The comet has a particularly unusual history. Up to 1840 its perihelion distance was 4.0 AU (four Sun-Earth distances or about 600 million km) and the comet was completely unobservable from Earth. That year, a fairly close encounter with Jupiter caused the orbit to move inwards to a perihelion distance of 3.0 AU (450 million km). Over the next century, the perihelion gradually decreased further to 2.77 AU. Then, in 1959, a further Jupiter encounter reduced the perihelion to just 1.29 AU. It currently completes one orbit of the Sun every 6.57 years.

The comet has now been observed from Earth on six approaches to the Sun - 1969 (discovery), 1976, 1982, 1989, 1996 and 2002. It is unusually active for a short period object and has a coma (a diffuse cloud of dust and gas surrounding the solid nucleus) and often a tail at perihelion. During the 2002/2003 apparitions, the tail was up to 10 arc minutes long, with a bright central condensation in a faint extended coma. Even 7 months after perihelion the tail continued to be very well developed, although it subsequently faded rapidly.

The comet typically reaches a magnitude around 12, although this is because the comet has outburst at perihelion at three of its last four returns in 1982/83, 1996/97 and 2002/03. Despite being a relatively active object, even at the peak of outburst the dust production rate is some 40 times lower than for 1P/Halley. Nevertheless, 67P/Churyumov-Gerasimenko is classed as a dusty comet.

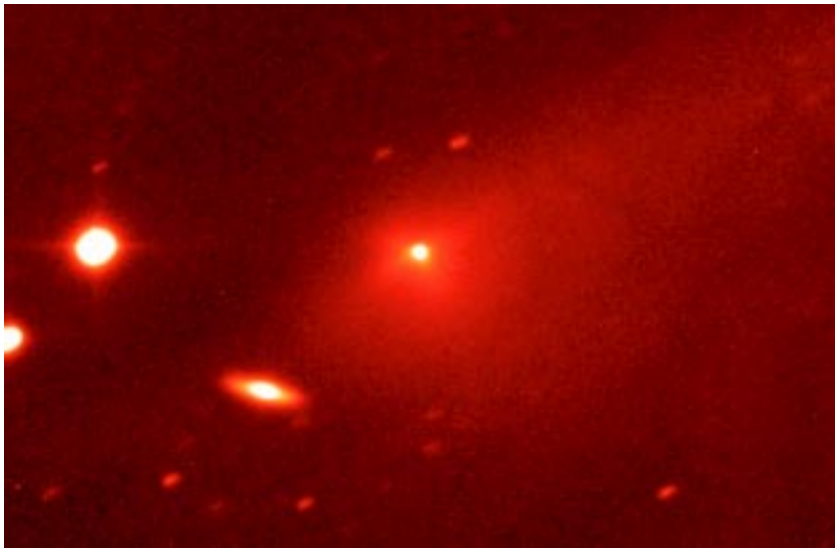

**Image of Comet 67P/ Churyumov-Gerasimenko.**
Photo: ESA

Sixty-one images of comet 67P/Churyumov-Gerasimenko were taken with the Wide Field Planetary Camera 2 on the Hubble Space Telescope 11–12 March 2003. The HST’s sharp vision enabled astronomers to isolate the comet’s nucleus from the coma. The images showed that the nucleus measures five by three kilometres and has an ellipsoidal (rugby ball) shape. It rotates once in approximately 12 hours.Asteroids.

### Comet 67P/Churyumov-Gerasimenko

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| Diameter of nucleus - estimated: | 3 x 5 km |
| Rotation period: | ~12 hours |
| Orbital period: | 6.57 year |
| Perihelion distance from Sun: | 194 million km (1.29 AU) |
| Aphelion distance from Sun: | 858 million km (5.74 AU) |
| Orbital inclination: | 7.12 degrees |
| Year of discovery: | 1969 |
| Discoverers: | Klim Churyumov &Svetlana Gerasimenko |