



# Astronomy

## La Société Guernesiaise

### Mars hoax

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For several years emails have been circulating falsely claiming that on 27 August of each year Mars would be closer to the Earth than it has been for thousands of years, and would appear as big as the Moon. Another will probably do its rounds this year. There is even a totally misleading PowerPoint presentation.

It is gross misinformation – probably a hoax, though what the motivation is for it I cannot guess. Whoever perpetrates this nonsense cannot even get the year right, as the event to which it refers actually happened in 2003, although Mars certainly did not (and will not, and cannot) appear as large as the Moon.



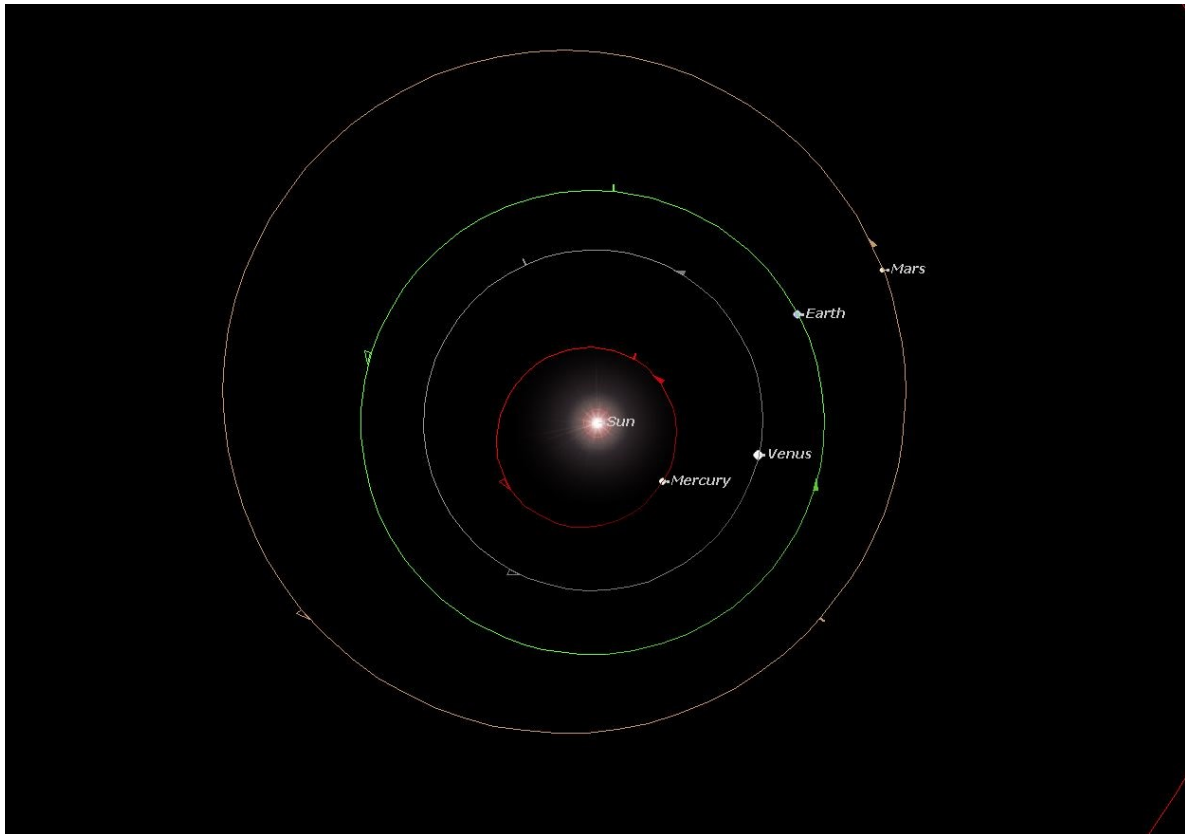
In August 2003 Mars was indeed (marginally) closer to the Earth than it had been for thousands of years, being about 56 million kilometres (34.6 million miles) from the

Earth. It was given a lot of publicity at the time, and, in common with many astronomical societies, we had open evenings at the Guernsey Observatory to view the planet. Its angular size then was 25 arc-seconds, compared with the Moon's 30 arc-minutes. In other words, Mars appeared one-75th of the angular diameter of the Moon. That is about as large as we ever see Mars, and occurs when it is at 'opposition', ie on the same side of the Sun as the Earth is. The Earth moves faster than Mars in its orbit around the Sun, and so regularly overtakes Mars, with over two years between each of these oppositions.

The table shows the dates and distances of Mars at oppositions for the first thirty years of the 21st century. The next best opposition will be in 2018.

Date	Distance (km x 106)	Distance (miles x 106)	Angular diameter (arc-seconds)
2001 June 13	68	42	21
2003 August 28	56	35	25
2005 November 07	70	43	20
2007 December 24	89	55	16
2010 January 29	99	62	14
2012 March 03	101	63	14
2014 April 08	93	58	15
2016 May 22	76	47	18
2018 July 27	58	36	24
2020 October 13	63	39	22
2022 December 08	82	51	17
2025 January 16	96	60	15
2027 February 19	101	63	14
2029 March 25	97	60	14

The reason why the distance of Mars changes with each opposition is because of the relationship between its orbit and that of the Earth. Mars's orbit has an eccentricity twice Earth's. The diagram shows the 2005 opposition (source: [StarryNight](#)). You can see that as the two planets follow their paths around the Sun they periodically meet up, at separations which depend on their relative positions in their orbits.



The “hoax” may, of course be someone's totally mistaken interpretation of angular diameter, although the fact that it is perpetrated year after year implies a mischievous intent. It is possible that someone originally has confused arc-seconds ( $1/3600$  degree) with arc-minutes ( $1/60$  degree). The most common explanation of the hoax, however, is that it arises because of the omission of the fact that to magnify the angular diameter of Mars to that of the Moon in August 2003 would have required a telescope and a 75-magnification eyepiece.

However, common sense and simple mathematics shows that Mars (diameter 6794, closest distance 55 million km) must always appear much smaller than the Moon (diameter 3476 km, average distance 384,400 km)!

There are several web sites explaining this hoax. For example, see:

- [Mars hoax – Wikipedia](#)
- [Beware the Mars Hoax \(NASA\)](#)
- [The Mutating Mars Hoax \(NASA\)](#)
- [Mars spectacular](#)

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