

Chaotic orbit of Comet Halley explained

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A team of Dutch and Scottish researchers led by Simon Portegies Zwart (Leiden University) has found an explanation for the chaotic behavior of the orbit of Halley's Comet. The findings are accepted for publication in the *Monthly Notices of the Royal Astronomical Society*.

Halley's Comet is one of the most famous comets. Halley can be seen from the Earth every 75 years. The last [time](#) was in 1986, the next time will be in 2061. Despite his regular return, the [comet's orbit](#) cannot be predicted exactly. This is partly due to processes inside the comet and partly because the orbit of Halley is disturbed by the chaotic interaction with the [planets](#) and minor bodies in the solar system.

The prevailing view among astronomers is that the orbit of Halley's comet cannot be calculated exactly because the orbit would be chaotic on a time scale of only 70 years. The team of astronomers has now shown that the comet's orbit is stable for more than 300 years. That's much longer than expected.

'We did the most accurate calculations of Halley and the planets ever,' said researcher Tjarda Boekholt (Leiden University). 'To our surprise, Halley's orbit was most strongly influenced by the planet Venus and not by Jupiter, the planet that was always pointed to as the biggest spoiler.'

In about 3000 years, the comet will approach the planet Jupiter relatively closely, so Halley will get a big push. From then on Venus will no longer be the main perturber and Jupiter will take over this role. 'After that, predictions of the orbit become less accurate, because the precise effect

of Jupiter's gravity introduces a relatively large error in our calculations,' says fellow researcher Inti Pelupessy.

Provided by Leiden University

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