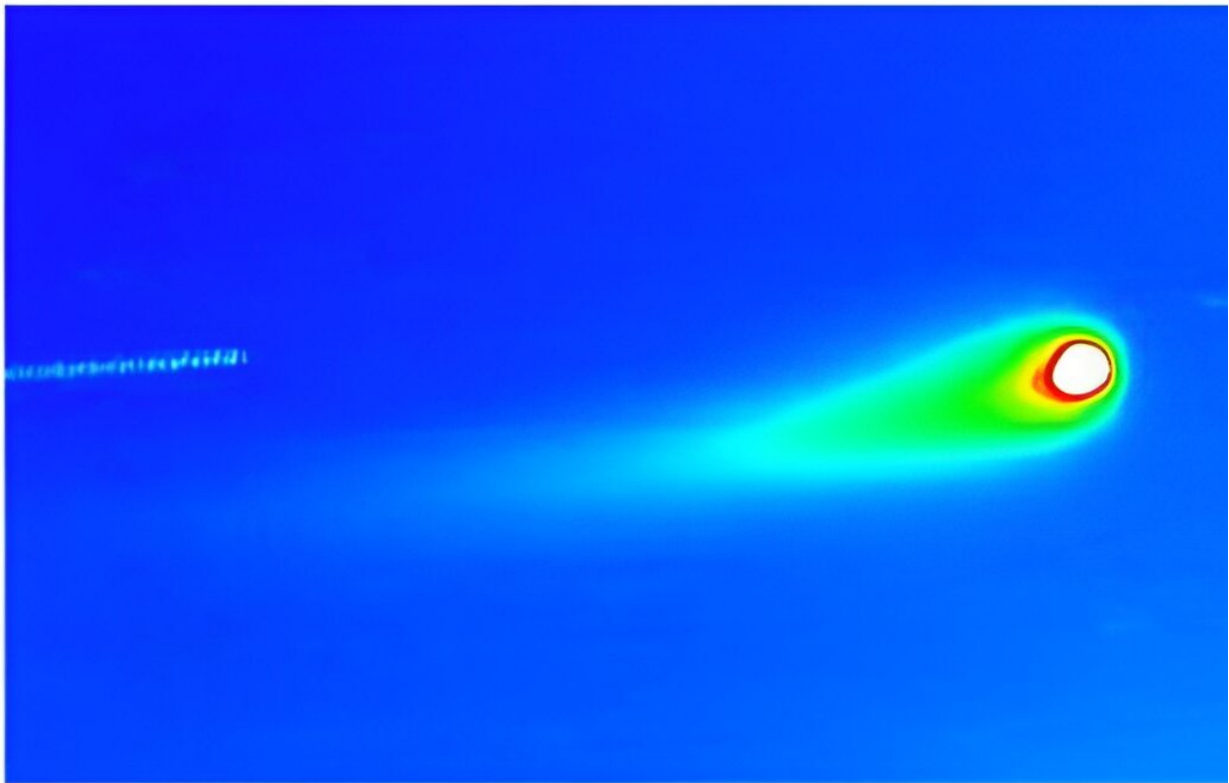


# Comet Tsuchinshan showing signs of breaking up prior to swinging around the sun

July 16 2024, by Bob Yirka

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Dust tail of comet Tsuchinshan-ATLAS. Upper panel: Cropped version of the computer processed image of the comet taken by R. Naves with a 30-cm f/9 reflector of the Observatorio Montcabre, Spain, on 2024 June. Lower panel: Four synchrones that mimic the axial directions of dust grains ejected from the nucleus (the large open circle) at different times. Credit: *arXiv* (2024). DOI: 10.48550/arxiv.2407.06166

Zdenek Sekanina, an astronomer with La Canada Flintridge in the U.S., reports what he describes as evidence of a possible breakup of comet Tsuchinshan prior to swinging around the sun. Sekanina specializes in comet behavior, specifically analyzing them to make predictions on whether they will split or fall apart as they near the sun.

He believes the [comet](#) is likely to break up before it can be seen from Earth and has [posted](#) his research on the *arXiv* preprint server.

Comet Tsuchinshan-ATLAS, known more formally as C/2023 A3, was first observed by astronomers at the XuYi Station of China's Purple Mountain Observatory just last year. It was subsequently lost but then found again by a team in South Africa. Since that [rediscovery](#), [anticipation](#) has been building because its size and trajectory suggested it would be easily seen during its close pass to Earth this October, perhaps appearing as bright as Jupiter in the night sky.

But the show that was expected will not likely come to pass, Sekanina suggests in his paper, because the comet exhibits signs of falling apart before its arrival.

When comets travel closer to the sun, they begin to lose gas. At closer proximity, they begin to lose dust, which creates visible tails. Prior research has shown that outgassing tends to push the comet ahead, like a thruster, and can also change its path and speed of rotation slightly.

Measurements of this non-gravitational acceleration allow astronomers to predict the path the comet will take as it swings around the sun. It is also used to make estimates regarding brightness if it passes close enough to be seen from Earth.

In his [observations](#), Sekanina found that the comet has not brightened as much as expected given its size, speed and rotation. And perhaps worse,

it has not grown brighter as it approaches the sun. He suggests the only plausible reason is that it is now in the advanced stages of fragmentation. He suggests that it is likely that the comet will break into pieces much too small to be seen from Earth.

**More information:** Zdenek Sekanina, Inevitable Endgame of Comet Tsuchinshan-ATLAS (C/2023 A3), *arXiv* (2024). [DOI: 10.48550/arxiv.2407.06166](https://doi.org/10.48550/arxiv.2407.06166)

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