Pluto spacecraft temporarily loses contact with Earth

NASA works to recover probe less than ten days before it reaches the dwarf planet.

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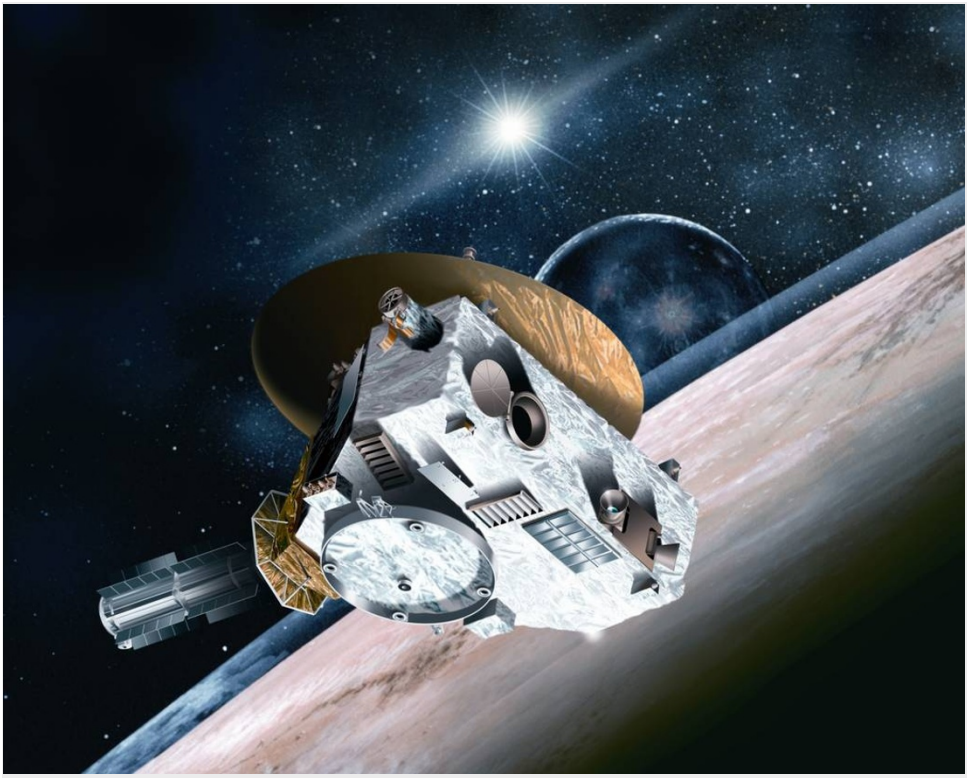

Johns Hopkins University Applied Physics Laboratory/Southwest Research Institute

An artist's impression of the NASA probe.

Update (9:49 p.m. BST, 6 July): The spacecraft went into safe mode because the flight computer was doing too many things at once, the New Horizons team has announced. While one part of the computer was compressing data it had already gathered, another part was burning a future command sequence into flash memory. The two tasks were more than the processor could handle at one time, said project manager Glen Fountain. No similar combination of tasks is expected between now and the 14 July encounter. Although some 30 science observations were lost because of the glitch, the spacecraft is on course to gather science as planned during the closest part of the Pluto flyby.

Update (3:55 a.m. BST, 6 July) : The New Horizons team plans to resume science operations on 7 July. It says that the spacecraft went into safe mode after a timing flaw in a command sequence.

Ten days before its historic fly-by of Pluto, NASA's New Horizons spacecraft lost contact with mission control for unknown reasons for 1 hour and 21 minutes on 4 July.

Engineers have since begun talking with the probe again, but NASA says it will take several days to get New Horizons back to normal. In the meantime, the US$700-million spacecraft is not recording science data. It is just 11 million kilometres from Pluto, and closing in fast.

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Communication issues are exacerbated by the fact that it takes four and a half hours to send a signal, travelling at the speed of light, across the nearly 4.8 billion kilometres to the spacecraft — and four and a half hours back. In that elapsed time, the Earth has rotated so much that mission controllers must switch from one to another of the three deep-space antennas that communicate with spacecraft: in Goldstone, California; Canberra; and Madrid.

Long-distance call

New Horizons has lost communications before. In March 2007, 14 months after its launch, a memory error sent the spacecraft automatically into safe mode. In this condition, as it is now, the probe stops doing other tasks, and essentially hunkers down and waits to hear from its controllers.

During the 2007 problem, New Horizons was back online in less than two days. But it is now much farther from Earth, delaying communications and making trouble-shooting a more intricate task. NASA has convened a team to investigate what happened. “We're working it, folks,” principal investigator Alan Stern, of the Southwest Research Institute in Boulder, Colorado, wrote on a Facebook fan page about Pluto.

The probe is on course to fly within 12,500 kilometres of Pluto on 14 July, in the first-ever visit to that dwarf planet. Most of the key science observations will be made within the 24-hour period of closest approach.

New Horizons had been taking colour and black-and-white images of Pluto and its moons, as well as measurements of energetic particles and solar wind in the surrounding space. The pictures reveal a series of dark spots marching along Pluto’s equator, each about 500 kilometres across. They also showed that Pluto has a bright polar cap, whereas its largest moon, Charon, has a dark one.

Mission controllers at the Johns Hopkins University Applied Physics Laboratory in Laurel, Maryland, uploaded the final sequence of commands for the fly-by on 3 July. The spacecraft temporarily lost communication at 1:54 p.m. US Eastern Daylight Time the following day.

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