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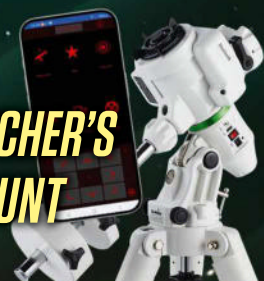
**TEXAS TOTALITY:
ON LOCATION FOR
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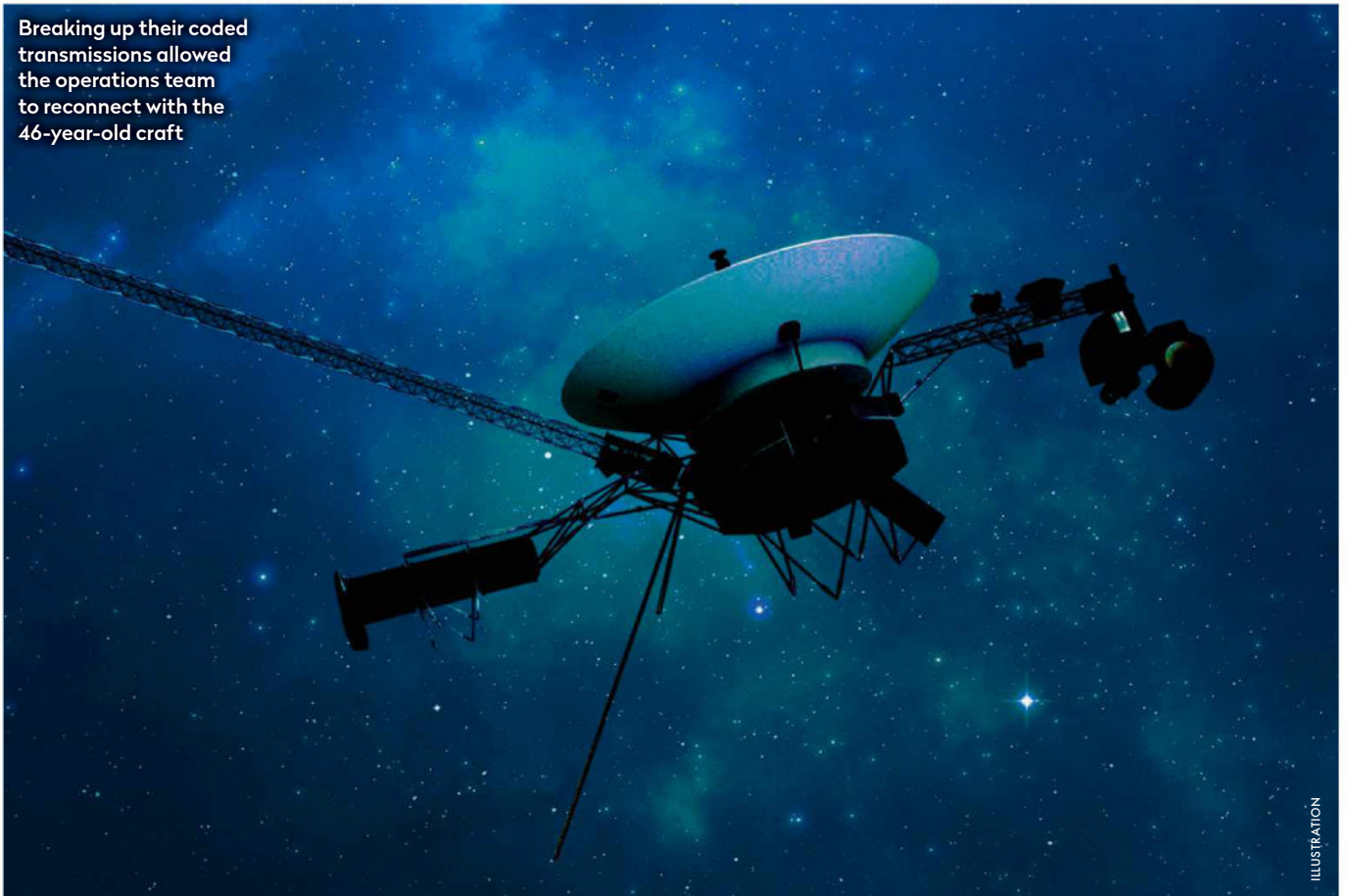
**THE UNSOLVED MYSTERY
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**SUMMER SPECTACLE: FIND
NOCTILUCENT CLOUDS**

**TESTED: SKY-WATCHER'S
NEW WI-FI MOUNT**



Breaking up their coded transmissions allowed the operations team to reconnect with the 46-year-old craft



ILLUSTRATION

Voyager 1 is back online and exploring the unknown

An interstellar rescue brings the venerable spacecraft back after months out of action

Voyager 1 is back in contact with mission control after being offline for five months. The most distant human-made object from Earth can now rejoin its sibling Voyager 2 in exploring the outer regions of our Solar System, where no other spacecraft have gone before.

Voyager 1 and 2 both launched from Earth in 1977 and have been sailing outwards into the depths of interstellar space ever since. On 14 November 2023, Voyager 1's normal science and engineering data transmissions suddenly became unintelligible. The spacecraft appeared to be receiving commands and operating normally, allowing the team to identify the problem. After months of testing, they found a single chip had stopped working on one of the spacecraft's three onboard computers, the flight data subsystem (FDS). This

is the system responsible for collating Voyager 1's science and engineering data before sending it back to Earth. Without the operational code usually stored on the chip, the FDS was now producing gibberish.

With no way to fix the chip, the team instead split the code up so it could be stored elsewhere. Initially they focused on reacquiring the engineering data, sending an update to Voyager 1 on 18 April 2024. It takes 22.5 hours for a radio signal to travel the 24 billion kilometres (15 billion miles) out to Voyager 1, and the same back, meaning the spacecraft's operations team didn't receive a message back until 20 April. But when it arrived, they had usable data from Voyager 1 for the first time in five months.

In 2012, Voyager 1 crossed into interstellar space, having passed through

what's known as the heliopause, the edge of the protective bubble around the Sun created by its solar wind. After 47 years, both spacecraft are beginning to show their age. They are powered by radioactive material, which is slowly decaying and reducing their power output. For several years, the operations team have been gradually shutting off heaters, back-ups and other non-essential elements to preserve power for key operational and scientific instruments.

Around 2026, however, they will have to begin shutting down science instruments. The Voyagers will keep transmitting even once all their scientific systems are shut down; however, by around 2036 they will pass beyond the range of receivers on Earth, continuing their journey further into the Galaxy in radio silence.

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