NASA Space Telescope Ends a 22-Year Watch

The Swift observatory studied powerful space explosions far longer than planned, but its orbit has dropped too low to keep working.

A space telescope orbits above Earth while pointing toward a bright explosion of light in space.

NASA's Neil Gehrels Swift Observatory has ended its science mission after 22 years in space, according to reporting by Live Science, citing NASA. The **spacecraft** had been watching some of the universe's most powerful explosions. Now it has fallen too low in orbit, the curved path an object follows around Earth, to collect reliable data. NASA expects it to reenter Earth's **atmosphere** in the next few weeks. **Reentry** means falling back into the layer of gases around our planet. The spacecraft is expected to break apart as it comes down.

Swift matters because it helped scientists study events that happen fast and far away. Space can seem still from Earth, but it is not. Stars explode. Black holes, which are objects with **gravity** so strong that even light cannot escape, can tear apart nearby stars. Bursts of energy can flash and fade before a normal **telescope** has time to point at them. Swift was built to respond quickly when those sudden events appeared.

The observatory launched in November 2004. Its main mission was planned to last only two years, but it kept working for more than 10 times that long. During its life, Swift made thousands of observations of supernovas, which are exploding stars, gamma-ray bursts, which are huge blasts of high-energy light, and violent events linked to black holes. NASA says its data contributed to about 7,000 scientific papers. That means many teams of scientists used Swift's measurements to ask new questions and test ideas.

Swift was a multiwavelength observatory, meaning it could study more than one kind of light. Human eyes see visible light, but space also gives off ultraviolet light and X-rays, which are forms of light our eyes cannot see. Looking at the same event in different kinds of light can reveal different clues, like studying a mystery with several tools instead of one. Swift's speed was also important. When an **explosion** appeared, engineers could turn the spacecraft toward it within minutes.

The mission ended because Earth orbit is not empty. The article reports that intense solar activity made the upper atmosphere puff outward more than usual. Solar activity means changes on the sun, including storms and bursts of energy. When the atmosphere expands upward, **satellites** meet more drag, a slowing force like

air pushing against a moving bike rider. That drag slowly lowered Swift's orbit. A planned August mission to raise the observatory's orbit using a private spacecraft failed after hardware problems, and that rescue craft burned up in the atmosphere.

Swift's ending shows a real trade-off in space science. Telescopes in orbit can see things that are hard or impossible to study from the ground. But they are also machines in a tough place, where fuel, aging parts, sunlight, and Earth's atmosphere all matter. For a middle school science class, this story connects to gravity, light, engineering, and how **evidence** becomes knowledge. Swift did not last forever, but it lasted long enough to change what scientists could notice about a universe that is always changing.

Written from reporting by Live Science.

THINK IT THROUGH

1. **If NASA has limited money, should it spend more on rescuing older spacecraft or building new ones? Defend your answer using the Swift story.**

2. **Swift was useful partly because it could react quickly. Why might speed matter in science, and where else could fast data collection change what people learn?**

3. **What information would you want before judging whether Swift's mission was a success?**

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S A G V E S S I E I T D R P I L Y T
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ATMOSPHERE EVIDENCE EXPLOSION GRAVITY REENTRY
SATELLITES SPACECRAFT SUPERNOVA TELESCOPE
WAVELENGTH

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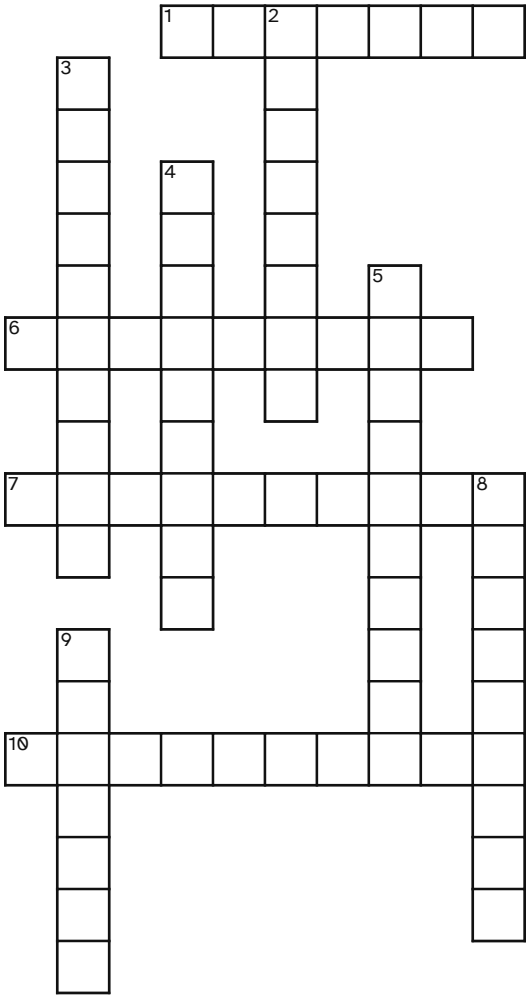

ACROSS

1 Return from space into the gases around Earth

6 Tool for viewing distant objects by gathering light

7 Layer of gases around a planet

10 Space objects that travel around larger bodies

DOWN

2 Facts or observations that support an idea

3 Distance between matching points on neighboring ripples

4 Massive star blast that releases tremendous light and energy

5 Vehicle built to travel or work beyond Earth's gases

8 Sudden powerful burst that releases energy, heat, and material

9 Pull between objects that have mass

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Where this came from

This article was written for 3andB from the reporting below. It is not a reprint — the wording is ours and the facts are theirs.

Live Science

"NASA's Swift observatory ends 22-year mission, will crash to Earth 'in the next few weeks'"

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https://www.livescience.com/space/space-exploration/nasas-swift-observatory-ends-22-year-mission-to-study-the-most-powerful-explosions-since-the-big-bang

WHAT IS IN THIS PACKET

The article and its discussion questions, a word search, and a crossword.

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