

Voyager 2's Lucky Day

Today NASA celebrates the [30th anniversary](#) of the launch of its amazingly successful Voyager spacecraft. My, how time flies.

The Voyager mission came about because, in the mid-1960s, a Caltech graduate student and budding Jet Propulsion Laboratory engineer named Gary Flandro chanced upon a shortcut to the outer solar system. Every 176 years, Flandro discovered, worlds align in such a way that a spacecraft flying past Jupiter can be accelerated and redirected toward all the other outer planets. By exploiting this opportunity, space scientists could complete a "grand tour" of Jupiter, Saturn, Uranus, Neptune, and even Pluto in just 12 years. The catch? The alignment was brief, and the launch would have to occur before 1978.

Regrettably, NASA had to abandon this marvelous go-for-broke opportunity because it was deemed too expensive by higher-ups. Voyagers 1 and 2 were the consolation prizes. In fact, recalls project scientist Ed Stone, the mission's funding was so tight that Voyager 2's flyby of Saturn had to take place before June 30, 1981 — the end of NASA's fiscal year!

So, officially, NASA never intended for the Voyagers to go to Uranus and Neptune. But JPL's rocketeers managed to fortify the craft with some cutting-edge technologies anyway, like a high-frequency radio transmitter and image-compression algorithms, to at least keep the dream alive.



Voyager 2's launch on August 20, 1977.
NASA

On August 20, 1977, a Titan-Centaur rocket rose into the blue sky over Cape Canaveral, Florida, sending Voyager 2 on its way. It was a beautiful, flawless launch.

Voyager 1's launch took place 16 days later, on September 5th, when the planetary alignment was better for reaching Jupiter and Saturn — but by which time the Uranus-Neptune trajectory "window" had closed.

In a little-known footnote to space history, Voyager 1's Titan booster shut down prematurely after liftoff. The powerful Centaur upper stage was barely able to compensate, reaching escape velocity 3.4 seconds before running out of fuel. Luckily, Voyager 1 would still reach Jupiter and Saturn as planned.

However, had the underachieving Titan been used instead for Voyager 2, whose trajectory hinged on getting maximum performance from its booster, its eventual encounters with Uranus (in 1986) and Neptune (in 1989) would have been lost. By pure chance, Voyager 2 got the better rocket.

Both craft continue to operate and set records for long-distance communication. Voyager 1 is an astounding 9.6 billion miles (103 astronomical units) from the Sun; Voyager 2 is 7.8 billion miles (83 a.u.) away. With a little luck, in the coming years Voyager 1 may pass through the [heliosheath](#), the outer vestige of the Sun's magnetic influence, and make it to true interstellar space.